

A46 Newark Bypass

Scheme Number: TR010065

6.1 Environmental Statement

Chapter 12 Population and Human Health - Track Changed

APFP Regulation 5(2)(a)

Planning Act 2008

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

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Infrastructure Planning

Planning Act 2008

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

**The A46 Newark Bypass
Development Consent Order 202[#]**

**6.1 Environmental Statement
Chapter 12 Population and Human Health - Track Changed**

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12 Population and Human Health

12.1 Introduction

- 12.1.1 This Chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) to be provided in the Environmental Statement (ES) to enable the identification and assessment of the likely significant effects on population and human health.
- 12.1.2 This includes consideration of the potential for both adverse and beneficial effects with regard to:
- Land use and accessibility, including:
 - Residential property and housing
 - Community land and assets
 - Development land and businesses
 - Agricultural land holdings
 - Walkers, cyclists and horse-riders (WCH)
 - Human health, including a range of personal, social, economic and environmental factors that influence human health status, such as:
 - Neighbourhood quality
 - Access to services, health and social care
 - Social capital
 - Employment and income
 - Access to green space, recreation, and physical activity
- 12.1.3 This assessment considers both construction and operational phase effects and has been prepared in accordance with the Design Manual for Roads and Bridges (DMRB) LA 112 Population and Human Health.¹
- 12.1.4 This Chapter has been undertaken in compliance with the Planning Inspectorate's EIA Scoping Opinion [APP-189]. Appendix 4.1 (Scoping Opinion Schedule of Comments and Responses) of the ES Appendices [APP-125] contains further information on how each of the matters raised in the EIA Scoping Opinion have been addressed.
- 12.1.5 Chapter 2 (The Scheme) of this ES [APP-046] contains a detailed description of the Scheme. The drawings referenced in this Chapter can be found in the ES Figures [contained within Volume 6.2 of the ES], and the technical appendices referred to in this chapter are presented in the ES Appendices [contained within Volume 6.3 of the ES].

¹ National Highways (2020) DMRB LA 112 – Population and Human Health, Revision 1 [online] available at: [LA 112 - Population and human health - DMRB \(standardsforhighways.co.uk\)](https://standardsforhighways.co.uk/la-112-population-and-human-health/) (last accessed December 2023).

12.2 Competent expert evidence

- 12.2.1 The competent expert has a PhD in a Social Science discipline and is a member of the International Association of Impact Assessment. The competent expert has 15 years of professional experience in the field of community, health and equality impact assessment including the preparation of ES chapters and has provided expert testimony at Public Hearings and acted as an Expert Witness for Equality at Public Inquiry.

12.3 Legislative and policy framework

- 12.3.1 The principal legislation and planning context for the assessment of the environmental effects of the Scheme on population and human health is presented below. The relevant legislation and policies listed below have been taken account of in the assessment.

Legislation

The Countryside and Rights of Way Act, 2000

- 12.3.2 The Countryside and Rights of Way Act, 2000² (CRoW Act) is the main legal framework governing public footpaths, bridleways, traffic and restricted byways. The CRoW Act makes provision for public access to the countryside; sets out provision for the management and maintenance of Public Rights of Way (PRoW); and makes allowance for temporary diversions to rights of way in order to carry out certain types of work.
- 12.3.3 The assessment has considered the impact of the Scheme on PRoW and public footpaths, walkways and cycleways.

The Environment Act, 2021

- 12.3.4 The Environment Act 2021³ provides the framework for environmental protection in the UK, aiming to improve air quality and other environmental pollutions which may have impacts on local human health. There are no specific targets derived from the Environment Act 2021 are applicable to this Chapter.
- 12.3.5 The assessment has considered the environmental effects of the Scheme on human health.

² UK Government (2000), Countryside and Rights of Way Act 2000. Available at: [Countryside and Rights of Way Act 2000 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2000/67/contents/enacted) (last accessed December 2023).

³ UK Government (2021). Environment Act 2021 [online] available at: [Environment Act 2021 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2021/23/contents/enacted) (last accessed December 2023).

The Equality Act, 2010

- 12.3.6 The Equality Act 2010 requires decision making to have due regard to the need to remove discrimination and support equality of opportunity for a range of 'protected characteristic' groups. This has been further considered within the Equality Impact Assessment (EqIA) [[APP-195REP5-036](#)] for the Scheme.
- 12.3.7 The assessment has considered the potential impact of the Scheme on community assets of importance to protected characteristic groups, such as school, places of worship and care homes.

The Localism Act, 2011

- 12.3.8 The Localism Act 2011⁴ introduced a wide range of measures to devolve greater powers to councils and communities. This further reinforces the policy commitment to improve local accountability and promote economic growth. The assessment has identified and evaluated the effects of the Scheme on local communities.

Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations, 2017

- 12.3.9 Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017⁵ states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Development on population and human health. This EIA follows this guidance.

National Policy

National Policy Statement for National Networks⁶

- 12.3.10 The National Policy Statement for National Networks (NPSNN) sets out the policy which the Scheme should comply with. It is also the basis for informing a judgement on the impacts of a Scheme, for example whether the Scheme is consistent with the requirements of the NPSNN. Compliance of the Scheme with the [2015](#) NPSNN is detailed within the NPSNN [\(2015\)](#) Accordance Table [[AS-090REP6-016](#)].
- 12.3.11 At the time of the DCO application submission in April 2024, a Draft NPSNN (2024) Accordance Table [APP-192] was submitted with the application which summarised compliance of the Scheme with the

⁴ UK Government (2011) Localism Act 2011 [online] available at: [Localism Act 2011 \(legislation.gov.uk\)](#) (last accessed December 2023).

⁵ The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online] available at: [The Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017 \(legislation.gov.uk\)](#) (last accessed December 2023).

⁶ Department for Transport (2014) National Networks National Policy Statement [online] available at: National Policy Statement for National Networks ([publishing.service.gov.uk](#)) (last accessed December 2023).

draft NPSNN. This was because, even though the NPSNN 2024 was still in draft at that time (having been published for consultation in March 2023), it was still capable of constituting a material consideration in the Secretary of State's decision on the Application. As the 2024 NPSNN was designated on 24 May 2024, the Draft NPSNN (2024) Accordance Table [APP-192] has been superseded by the NPSNN (2024) Accordance Table [REP5-032], which assesses the Scheme against the designated 2024 NPSNN. The application for development consent for the Scheme was accepted for examination on 23 May 2024. As set out in the transitional provisions of the 2024 NPSNN (paragraphs 1.16 and 1.17), the 2015 NPSNN has effect for any application for development consent accepted for examination prior to 24 May 2024 and will inform decisions made by the Secretary of State in relation to those applications. However, it is noted that the 2024 NPSNN may still be an important consideration for the Secretary of State for Transport when determining whether to consent the DCO for this Scheme. Therefore, the NPSNN (2024) Accordance Tables [REP5-032] summarised compliance of the Scheme with the 2024 NPSNN.

- ~~12.3.11 A draft NPSNN was published for consultation in March 2023. The consultation period ended in June 2023. The draft NPSNN may be subject to change following the consultation and once published in its designated form. Although this is currently in draft it may still be an important consideration for the Secretary of State when determining whether to grant development consent for this Scheme. Accordingly, the Draft NPSNN Accordance Tables [APP-192] summarise compliance of the Scheme with the draft NPSNN.~~
- 12.3.12 The policies of relevance to population and human health within the 2015 NPSNN and detail on how they have been addressed in the assessment are provided below:
- 12.3.13 Within the 2015 NPSNN (paragraphs 3.19 to 3.22), the Government has committed to create a more accessible and inclusive transport network that provides a range of opportunities and choice for people to connect with jobs, services and friends and family. It is stated that applicants are expected to deliver improvements that reduce community severance and improve accessibility and inclusivity.
- 12.3.14 It is acknowledged in the 2015 NPSNN (paragraphs 4.79 to 4.82), that new or enhanced national network infrastructure may have direct and indirect impacts on health, wellbeing and the quality of life of the population. An ES should identify and set out the assessment of likely significant adverse health impacts, where the proposed project is likely to have significant environmental impacts that would have an effect on human beings. The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate.
- 12.3.15 As per paragraphs 5.162 to 5.185 of the 2015 NPSNN, applicants are required to consider taking appropriate mitigation measures to

address adverse effects on PRoW and consider opportunities to improve access, in accordance with the requirements associated with the assessment of impact on open space, green infrastructure and Green Belt. Also, consideration should be given to the use, character, attractiveness, and convenience of the PRoW.

- 12.3.16 These considerations have been taken into account in the assessment including the identification, assessment and evaluation of existing land uses, the movement of walkers, cyclists and horse-riders, relevant health data, and the outcomes of related assessments.

National Planning Policy Framework⁷

- 12.3.17 The National Planning Policy Framework (NPPF) (December 2024⁴³) sets out the Government's planning policy framework for the whole of England, including the Government's expectation for content and quality of planning applications and local plan policy. The overall strategic aims of the NPSNN and NPPF are consistent. The NPPF may be an important and relevant matter but does not form the basis for a decision on an NSIP.
- 12.3.18 The NPPF provides a framework within which Local Authorities and residents can produce local and neighbourhood plans reflecting the needs and priorities of communities.
- 12.3.19 Section 8 sets out core planning principles of the NPPF to achieve healthy, inclusive, and safe places by promoting social interaction, ensuring safety and accessibility of public areas and supporting healthy lifestyles. This also includes addressing identified local health and wellbeing needs through provision of safe and accessible green infrastructure.
- 12.3.20 The same section presents core principles to support access to a network of high-quality open spaces and opportunities for sport and physical activity. Planning policies and decisions should protect and enhance PRoW and National Trails to support public health.
- 12.3.21 Section 9 encourages developments that provide opportunities for sustainable transport, particularly by giving priority to pedestrian and cycle movements, and providing access to high quality public transport facilities.
- 12.3.22 This assessment has taken these principles into account by assessing the impacts of the Scheme on the local populations access

⁷ Ministry of Housing, Communities and Local Government (December 2024) National Planning Policy Framework [online] available at: https://assets.publishing.service.gov.uk/media/67aaf8f3b41f783cca46251/NPPF_December_2024.pdf (last accessed March 2025) Department for Levelling Up, Housing & Communities (December 2023). National Planning Policy Framework [online] available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://assets.publishing.service.gov.uk/media/67aaf8f3b41f783cca46251/NPPF_December_2024.pdf) (last accessed March 2024).

to open and green space, and PRoW. This has been evaluated against the human health baseline of the local population.

Local Policy

12.3.23 Local planning policy relating to population and human health of relevance to the Scheme is outlined below.

Local Development Framework Amended Core Strategy⁸

12.3.24 This document sets out the key issues that Newark & Sherwood District Council and their partners need to address over the next twenty years. It sets out a vision, a series of objectives and policies to deliver them.

12.3.25 As part of the Council's vision, the document notes that 'By 2033, Newark-on-Trent and Sherwood will become: An area providing a high quality of life, made up of thriving sustainable urban and rural communities where people want to and can, live and work' and that 'Access will be improved, key transport improvements will have been secured and non-car use encouraged'.

12.3.26 Key strategic objectives include:

- 'To ensure and sustain a network of sustainable communities which offer a sense of place, that are safe, balanced, socially inclusive and can respond to the needs of local people'.
- 'To retain and improve accessibility for all, to employment, services, community, leisure and cultural activities, through the integration of development and transport provision, ensuring that most new development will be located where it is accessible to use services and facilities by a range of means of transport'.

12.3.27 This assessment has taken these considerations into account by evaluating the impacts of the Scheme on a number of areas including the accessibility of services and the safety of the local population.

Allocations and Development Management Plan Document⁹

12.3.28 This document is included within the Newark & Sherwood Local Development Framework alongside the Amended Core Strategy.

12.3.29 Its main purpose is to allocate sufficient land for housing, employment and retail, to meet the needs of Newark & Sherwood to 2026 and beyond.

⁸ Newark & Sherwood District Council, 2019. Local Development Framework Amended Core Strategy. Available at: <https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/planning-policy/pdfs/core-strategy/ACS2019.pdf> (last accessed December 2023).

⁹ Newark & Sherwood District Council, 2013. Allocations and Development Management Plan Document. Available at: [Newark & Sherwood Allocations & Development Management DPD \(newark-sherwooddc.gov.uk\)](https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/planning-policy/pdfs/core-strategy/ACS2019.pdf).

- 12.3.30 The document identifies the town of Newark as the Districts largest settlement and as significant as a centre of commerce and trade.
- 12.3.31 The assessment considers the impacts of the Scheme on land intended for housing, employment and business.

Newark & Sherwood District Council Community Plan (2023-2027)¹⁰

- 12.3.32 This document sets out the Council's objectives over for 2020-2023-2027 period, building on previous published plans.

12.3.33—As part of the Council's vision, the document notes that the Council 'wants to make a positive difference - now and for future generations. [They are] passionate for everyone within [their] community to fulfil their potential and [the Council's] aspiration is to be at the forefront of sustainable living'. A key objective is to 'improve the health and wellbeing'. As part of the Council's vision, the document notes 'We want to do all we can to enable local residents and businesses to flourish and fulfil their potential as well as encouraging more visitors to enjoy all that Newark-on-Trent and Sherwood has to offer. In order to achieve these, we will be locally focused and nationally connected - driven by what matters most to the people we serve and with a perspective and relationships stretching well beyond our boundaries.' A key objective is to 'improve the health and wellbeing of local residents'. Key ambitions for this Strategy are 'To have healthy and sustainable places' and 'To enable healthier decision making'.

12.3.33

- 12.3.34 This assessment evaluates the impact of the Scheme on the health of the local population.

Nottinghamshire Health and Wellbeing Board, Nottinghamshire Joint Health and Wellbeing Strategy (2022-2026) Newark-on-Trent and Sherwood Wellbeing Partnership Plan (2019-2022)¹¹

12.3.35—The vision for the Nottinghamshire Joint Health & Wellbeing Strategy, which covers the Newark and Sherwood area, is for partners to 'work together to enable everyone in Nottinghamshire to live healthier and happier lives, to prosper in their communities and remain independent in later life'. Key ambitions of the Strategy are to 'create healthy and sustainable places' and 'keep [...] communities safe and healthy'. The Newark-on-Trent and Sherwood Health and Wellbeing

¹⁰ Newark & Sherwood District Council, 2020. Newark & Sherwood District Council Community Plan (2023-2027)
Available at: <https://www.newark-sherwooddc.gov.uk/media/nsdc-redesign/documents-and-images/your-council/your-council/about-us/community-plan/12.12.23-Community-Plan-2023v16-Appendix-1.pdf> (last accessed March 2025)
<https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/strategies-and-policies/pdfs/13.10.20---Community-Plan-Appendix---Final.pdf>.

¹¹ Nottinghamshire Health & Wellbeing Board, 2019. Nottinghamshire Joint Health and Wellbeing Strategy (2022-2026) Newark & Sherwood Wellbeing Partnership Plan (2019-2022). Available at: <https://www.nottinghamshire.gov.uk/media/4350014/nottinghamshirejointhealthwellbeingstrategy2022-2026.pdf>
<https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/economic-development/Newark-&-Sherwood-Economic-Growth-Strategy-2021-2026.pdf> (last accessed March 2025) (last accessed December 2023).

~~Partnership acts as the local place-based delivery group of the Nottinghamshire Health & Wellbeing Board, delivering the Strategy's healthy and sustainable places ambitions. The vision for this Strategy is 'Working together to enable the people of Nottinghamshire, from the youngest to the oldest, to live happier and healthier lives in their communities, particularly where the need is greatest.'~~

12.3.35

12.3.36 This assessment evaluates the impact of the Scheme on the health of the local population.

Newark & Sherwood District Council Economic Growth Strategy (2021-2026)¹²

12.3.37 Newark & Sherwood District Council's Economic Growth Strategy 2021-2026 defines how the Council will work with businesses and residents to lead the local economy and 'build a shared prosperity'.

12.3.38 Feeding into the Economic Growth Strategy, the Infrastructure Delivery Plan (2017) identifies the various forms of infrastructure that are required to meet the level of growth anticipated in the area¹³. It identifies sections of the existing A46 as requiring improvements in order to accommodate planned growth in the district.

12.3.39 The assessment identifies how the Scheme will impact upon employment and income in the local area.

National Highways policy

National Highways Delivery Plan (2020-2025)

12.3.40 Section 1.3.6 sets out the National Highways Delivery Plan 2020-25,¹⁴ which details how National Highways will invest in the network over the second road period (2020-25). A key aim of the strategy is to deliver environmental, social and economic benefits both nationally and regionally - which highlights its relevance to this chapter.

National Highways Environment Strategy

12.3.41 Section 1.3.5.2 states that the National Highways Environment Strategy¹⁵ sets out National Highways' vision that will guide its environmental actions and activities over the next five years. The strategy outlines National Highways' commitment to improving its

¹² Newark & Sherwood District Council, 2023. Economic Growth Strategy. Available at: <https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/economic-development/Newark-&-Sherwood-Economic-Growth-Strategy-2021-2026.pdf> (last accessed December 2023).

¹³ Newark & Sherwood District Council. 2017. Infrastructure Delivery Plan. Available at: [Infrastructure-Delivery-Plan-Feb-2017.pdf](https://www.newark-sherwooddc.gov.uk/media/newark-and-sherwood/images-and-files/infrastructure-delivery-plan/Infrastructure-Delivery-Plan-Feb-2017.pdf) ([newark-sherwooddc.gov.uk](https://www.newark-sherwooddc.gov.uk)) (last accessed December 2023).

¹⁴ National Highways Delivery Plan 2020-2025 [online] available at: [5-year-delivery-plan-2020-2025-final.pdf](https://www.nationalhighways.co.uk/media/5-year-delivery-plan-2020-2025-final.pdf) ([nationalhighways.co.uk](https://www.nationalhighways.co.uk)) (last accessed December 2023).

¹⁵ National Highways (2015) National Highways Environment Strategy [online]. Available at: [Environment_Strategy__21_.pdf](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/421111/Environment_Strategy__21_.pdf) ([publishing.service.gov.uk](https://www.publishing.service.gov.uk)) (last accessed December 2023).

environmental outcomes. The part of the strategy with particular relevance to this chapter is the ‘lever’ which focusses on protecting the health, safety and wellbeing of people living within the vicinity of National Highways’ Schemes.

National Highways Air Quality Strategy

12.3.42 Section 1.3.5.3 of the National Highways Air Quality Strategy¹⁶ sets out National Highways’ strategy to improve air quality on and around the strategic network, through to 2021. Air quality is a factor which can impact human health and one which is considered within this chapter.

National Highways Sustainable Development Strategy

12.3.43 Section 1.3.8 sets out the National Highways sustainable development strategy.¹⁷ The strategy states that sustainable development can be put into practice by focusing on the five capitals of sustainability. The pillars of ‘human’ and ‘social’ are of particular relevance to this chapter.

Standards and guidance

12.3.44 The following standards and guidance are also considered to be relevant and have been taken into account during the assessment of population and human health effects due to the Scheme:

- DMRB – LA112 Population and Human Health¹⁸
- Institution of Environmental Management and Assessment (IEMA) – Health in Environmental Impact Assessment: A primer for a proportionate approach¹⁹
- IEMA – Determining Significance for Human Health in Environmental Impact Assessment²⁰

¹⁶ National Highways (2017) National Highways Air Quality Strategy [online] available at: Highways England Air Quality Strategy - GOV.UK (www.gov.uk) (last accessed December 2023).

¹⁷ National Highways Sustainable Development Strategy [online] available at: [sustainable_development_strategy.pdf](https://www.nationalhighways.co.uk/sustainable_development_strategy.pdf) (nationalhighways.co.uk) (last accessed December 2023).

¹⁸ National Highways (2020) DMRB LA 112 – Population and Human Health, Revision 1 [online] available at: [LA 112 - Population and human health - DMRB \(standardsforhighways.co.uk\)](https://www.standardsforhighways.co.uk/la-112-population-and-human-health) (last accessed December 2023).

¹⁹ Institution of Environmental Management and Assessment (2022), *Health in Environmental Impact Assessment: A primer for a proportionate approach*. Accessed at: https://www.researchgate.net/publication/358589432_Health_in_Environmental_Impact_Assessment_A_Primer_for_a_Proportionate_Approach <https://www.iema.net/download-document/7010> (last accessed December 2023/January 2025).

²⁰ Institution of Environmental Management and Assessment (2022), *Determining Significance for Human Health in Environmental Impact Assessment*. Accessed at: <https://www.iema.net/resources/blog/2022/11/17/launch-of-the-eia-guidance-for-considering-impacts-on-human-health>.

12.4 Consultation

- 12.4.1 During the Options Appraisal Stage the Active Travel Partnership²¹ produced a four-page document (contained in Appendix C (Walking, Cycling and Horse-Riding Assessment and Review) (WHCAR) of the Transport Assessment [[APP-193REP5-034](#)]) whereby local user groups provided their concerns, approvals, and recommendations for the Scheme. This WCHAR is supported by:
- Newark Sports Association and Castle Cycling Club
 - Newark Riding Group, Nottinghamshire CTC, Cycling UK
 - British Horse Society Access, East and West Midlands
 - Coddington Parish Council
 - The Winthorpe Residents' A46 Consultation Group
- 12.4.2 The Partnership (including the five bodies listed above) approved the opportunity to improve active travel provision on Farndon Road, raised concern over potential closures to existing active travel routes over the A46 and proposed new travel routes linking with Newark Showground.
- 12.4.3 A further meeting was held with the Active Travel Partnership on 6 October 2022 to introduce the Scheme and provide the updates since the preferred route announcement. On 11 May 2023, an additional meeting was held, to further discuss active travel challenges and opportunities associated with the Scheme. The likely affected WCH routes were agreed with the Active Travel Partnership. The main concerns identified centered on routes which were outside of the Order Limits and would therefore rely on a designated funding application. Designated fund opportunities, of which there are approximately 20, have been captured within Appendix C (Walking, Cycling and Horse-Riding Assessment and Review) of the Transport Assessment, [[APP-193REP5-034](#)]. These Designated fund opportunities do not form part of the Scheme and have not been assessed within this ES.
- 12.4.4 A statutory public consultation was undertaken between 26 October and 12 December 2022 with the public, statutory bodies, businesses and landowners.
- 12.4.5 Many of the comments around population and human health related to WCH provision as part of the Scheme. Residential feedback particularly focused on safety and access concerns around new and existing WCH routes.

²¹ The Active Travel Partnership is a working group for interested parties. The Partnership comprises the following: Nottinghamshire County Council, Ramblers (Nottingham Area), Newark Sports Association, British Horse Society, Cycling UK, Nottinghamshire Footpaths Preservation Society and Sustrans. It is understood that Parish Councils and Residents Groups have also been involved in the Partnership as discussions progressed.

- 12.4.6 Some residents raised concerns that the new plans would increase severance for residents of Winthorpe seeking to access Newark.
- 12.4.7 Residents were also concerned regarding the safety of the new A46 underpass regarding lighting and security. Concerns around the safety of pedestrians crossing the road or using pavements was also highlighted.
- 12.4.8 Full details of the statutory consultation responses are provided in the Consultation Report [APP-028] and Consultation Report Annexes [APP-029 to APP-044].

12.5 Assessment methodology

- 12.5.1 The approach used to undertake the population and human health assessment comprises of two methodologies – one for land-use and accessibility and another for human health. These are described further below.
- 12.5.2 The assessment has made use of desk-based information available from the Office for National Statistics (ONS), Ordnance Survey AddressBase, Public Health (England) (now known as UK Health Security Agency) and Newark & Sherwood District Council; as well as drawing upon information determined as part of the assessment of other relevant disciplines presented within this ES.
- 12.5.3 The assessment on land-use and accessibility focuses on those impacts that are likely to have significant effects on the community, and has been completed in accordance with the standard on population and human health impact assessment included in DMRB LA 112. Significance has been determined by considering the sensitivity of the receptor, as well as the magnitude of the impact on those receptors.
- 12.5.4 DMRB LA 112 does not provide a framework for assigning significance of effects to human health impacts. As such, the assessment on human health has been completed in accordance with IEMA's 'Determining Significance for Human Health in Environmental Impact Assessment'.

Land use and accessibility

Sensitivity

- 12.5.5 Table 12-1 below sets out criteria that has been used to describe and assess the sensitivity of receptors, as outlined in DMRB LA 112 Population and human health, Revision 1.

Table 12-1: Sensitivity criteria

Sensitivity	Sensitivity criteria
Very high	<p>Private property and housing:</p> <ul style="list-style-type: none"> Existing private property or land allocated for housing located in a local authority area where the number of households are expected to increase by >25% by 2041 (ONS data). Existing housing and land allocated for housing (e.g. strategic housing sites) covering >5ha and/or >150 houses. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> Complete severance between communities and their land/assets, with little/no accessibility provision Alternatives are only available outside the local planning authority area. The level of use is very frequent (daily). The land and assets are used by the majority (>=50%) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >5ha. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure. Access between land and key agricultural infrastructure is required on a frequent basis (daily). <p>WCH:</p> <ul style="list-style-type: none"> National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little/no potential for substitution. Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. Rights of way for WCH crossing roads at-grade with >16,000 vehicles per day.
High	<p>Private property and housing:</p> <ul style="list-style-type: none"> Private property or land allocated for housing located in a local planning authority area where the number of households are expected to increase by 16-25% by 2041 (ONS data). Existing housing and land allocated for housing (e.g. strategic housing sites) covering >1-5ha and/or >30-150 houses. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> There is substantial severance between community and assets, with limited accessibility provision.

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

Sensitivity	Sensitivity criteria
	<p>can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys.</p> <ul style="list-style-type: none"> Rights of way for WCH crossing roads at-grade with >4,000 – 8,000 vehicles per day.
Low	<p>Private property and housing:</p> <ul style="list-style-type: none"> Proposed development on unallocated sites providing housing with planning permission/in the planning process. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> Limited existing severance between community and assets, with existing Equality Act 2010 compliant accessibility provision. Alternative facilities are available at a local level within the wider community. The level of use is infrequent (monthly or less frequent). The land and assets are used by the minority (>=50%) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> Proposed development on unallocated sites providing employment with planning permission/in the planning process. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure. Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent). <p>WCH:</p> <ul style="list-style-type: none"> Routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. Rights of way for WCH crossing roads at-grade with <4,000 vehicles per day.
Negligible	<p>Private property and housing:</p> <ul style="list-style-type: none"> N/A. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> No or limited severance or accessibility issues. Alternative facilities are available within the same community. The level of use is very infrequent (a few occasions yearly). The land and assets are used by the minority (>=50%) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> N/A. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> Areas of land which are infrequently used on a non-commercial basis. <p>WCH:</p>

Sensitivity	Sensitivity criteria
	<ul style="list-style-type: none"> N/A.
Negligible	<p>Private property and housing:</p> <ul style="list-style-type: none"> N/A. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> No or limited severance or accessibility issues. Alternative facilities are available within the same community. The level of use is very infrequent (a few occasions yearly). The land and assets are used by the minority ($\geq 50\%$) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> N/A. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> Areas of land which are infrequently used on a non-commercial basis. <p>WCH:</p> <ul style="list-style-type: none"> N/A.

Source: DMRB LA 112 Population and human health, Revision 1, Table 11 Environmental value (sensitivity) and descriptions.

Magnitude

12.5.6 The magnitude of impacts has been assessed following the principles below. Table 12-2 below sets out criteria that have been used to describe and assess the impact on community and health receptors, as outlined in DMRB LA 112 Population and Human Health, Revision 1.

Table 12-2: Impact magnitude criteria for receptors

Magnitude	Criteria
Major	<p>Private property and housing, community land and assets, development land and businesses and agricultural land holdings:</p> <ul style="list-style-type: none"> Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements, e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets. Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. <p>WCH:</p> <ul style="list-style-type: none"> >500m increase (adverse)/decrease (beneficial) in WCH journey length.
Moderate	<p>Private property and housing, community land and assets, development land and businesses and agricultural land holdings:</p> <ul style="list-style-type: none"> Partial loss of/damage to key characteristics, features or elements, eg partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings.

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

Source: DMRB LA 112, Revision 1, Table 3.12 Magnitude of impact and typical descriptions

Significance

12.5.7 Subsequent to identifying an appropriate receptor sensitivity and magnitude of impact using Table 12-1 and Table 12-2, the likely significance category and overall significance of effects has been assessed by applying the matrix provided below, along with professional judgment to consider site specific factors that may be of relevance. Significant effects comprise those effects that are within the moderate, large or very large categories.

Table 12-3: Assessing the significance of potential effects

Environmental value (sensitivity)	Magnitude of potential impact (degree of change)					
		No Change	Negligible	Minor	Moderate	Major
	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Source: DMRB LA104

Human health

Sensitivity

12.5.1 Table 12-4 below sets out criteria that has been used to describe and assess the sensitivity of receptors, as outlined in IEMA: Determining Significance for Human Health in Environmental Impact Assessment.

Table 12-4: Sensitivity criteria

Category/Level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependents; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very Low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are

Category/Level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
	not limited from undertaking daily activities; people who are independent (not a carer or dependent); people with good health status; and/or people with a very high capacity to adapt.

Source: IEMA (2022): Determining Significance for Human Health in Environmental Impact Assessment

Magnitude

- 12.5.2 The magnitude of impacts has been assessed using professional judgement and following the principles below. Table 12-5 below sets out the criteria that was used to describe and assess the impact on community and health receptors. This is outlined in IEMA: Determining Significance for Human Health in Environmental Impact Assessment and adapted for consistency across this EIA.

Table 12-5: Impact magnitude criteria

Category/Level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Major	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Moderate	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Minor	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Source: IEMA (2022): Determining Significance for Human Health in Environmental Impact Assessment (magnitude category labels have been adapted for consistency within this EIA)

Significance

- 12.5.3 Table 12-6 below sets out the significance matrix for determining human health effects, where large or moderate effects are considered to be significant and slight or neutral are considered to be not significant.

Table 12-6: Human Health significance matrix

		Sensitivity			
		High	Medium	Low	Very Low
Magnitude	Major	Large	Large or Moderate	Moderate or Slight	Slight or Neutral
	Moderate	Large or Moderate	Moderate	Slight	Slight or Neutral
	Minor	Moderate or Slight	Slight	Slight	Neutral
	Negligible	Slight or Neutral	Slight or Neutral	Neutral	Neutral

Source: IEMA (2022): Determining Significance of Human Health in Environmental Impact Assessment (magnitude categories and significance labels have been adapted for consistency within this EIA)

12.5.4 In accordance with DMRB LA 112 Population and human health, the nature of the effect has also been defined as either:

- Beneficial – a beneficial health impact is identified
- Adverse – an adverse health impact is identified
- Neutral – no discernible health impact is identified
- Uncertain – where uncertainty exists as to the overall health impact

12.5.5 The likely effect is also defined in terms of the timescale along which the likely effect on receptors could be felt. Effects generated as a result of the construction phase of the Scheme are classified as 'short-term' to 'medium-term'. Effects that result from the Scheme once completed are classified as 'long-term'. The duration of the effect is also a determining factor in the magnitude of change, as noted in Table 12-5.

12.6 Assessment assumptions and limitations

12.6.1 The assessment has been based on the Scheme description and construction strategy presented in Chapter 2 (The Scheme) of this ES and has taken into account the lateral limits of deviation illustrated on the Works Plans [REP3-002] and vertical limits of deviation secured under Article 10 of the draft DCO [[REP4-003](#)[REP6-004](#)] to establish a realistic worst case assessment scenario.

12.6.2 The assessment of significant effects has been carried out against a benchmark of current baseline conditions within the Local Impact Area (LIA) (see Figure 12.1 (Local Impact Area) of the ES Figures [AS-066] and Wider Impact Area (WIA) (see Figure 12.2 (Wider Impact Area) of the ES Figures [AS-067]). As with any dataset, these may be subject to change over time.

12.6.3 Baseline LIA level data was not available for some employment and health indicators. Where this is the case, WIA level data is the smallest geographical area available for this data. All LIA calculations

are based on the Lower layer Super Output Areas (LSOAs)²² level, and this output level is not available from the data provider NOMIS.

- 12.6.4 The statutory public consultation was undertaken in late 2022, and the findings from this have informed this assessment.
- 12.6.5 WCH surveys have been undertaken for 17 locations within the vicinity of the Scheme. A breakdown of the results can be found in Appendix 12.1 (Walker, Cyclist and Horse-rider (WCH) Survey Results) of the ES Appendices [REP4-009].
- 12.6.6 Amenity effects are identified where at least two significant residual (post-mitigation) effects stemming from changes in noise, air quality and/or landscape and visual amenity combine at the same location/receptor.
- 12.6.7 The assessment of impacts on agricultural land contains some limitations. Agricultural land ownership information was only available within the LIA. Therefore, the assessment on agricultural land and associated business may not be a true reflection of the impact to business viability as landowners may have additional holdings outside of the LIA. The assessment of impacts on agricultural land is therefore reflective of a reasonable worst case.
- 12.6.8 Where agricultural land has been identified for permanent acquisition and the proposed use is compatible with it being returned to its former use, we have assumed for the purposes of this assessment that this will be the case.

12.7 Study area

- 12.7.1 Study areas have been defined in accordance with DMRB LA 112 Population and Human Health and professional judgement.²³ The population and human health assessment, for both the construction and operational phases, have been conducted at both a LIA level and a WIA level dependent on the type of impact being assessed. The study areas are defined as follows:
- LIA: The area located within 500 metres of the Order Limits will be referred to as the LIA (shown on Figure 12.1 (Local Impact Area) of the ES Figures [AS-066]).
 - WIA: The area covered by the local authority of Newark & Sherwood District Council, which includes the closest settlements of Newark-on-

²² Lower layer Super Output Areas (LSOAs) are a geographical area for census statistics. LSOAs comprise between 400 and 1,200 households and have a resident population of between 1,000 and 3,000 people.

²³ Standards for Highways, 2020. Design Manual for Roads and Bridges, LA112- Population and Human Health. Available at: <https://www.standardsforhighways.co.uk/dmrb/search/1e13d6ac-755e-4d60-9735-f976bf64580a> (last accessed December 2023).

Trent and Winthorpe (shown on Figure 12.2 (Wider Impact Area) of the ES Figures [AS-067]).

- 12.7.2 The LIA is the primary study area for land-use and accessibility and is designed to capture most potential population and human health effects during construction and operation of the Scheme.
- 12.7.3 The WIA includes the extent of the area that may be affected by the construction and operation of the Scheme, and is used for the consideration of human health effects, including potential effects on economic activity. The WIA also covers the extent of the affected road network (ARN) which ensures that the effects of the Scheme upon traffic that may result in an impact upon human health (noise and air quality) are fully assessed. This is important as one of the objectives of the Scheme is to support the economic growth aspirations of the district and the region by providing a more reliable road network.

12.8 Baseline conditions

- 12.8.1 A range of publicly available data sources have been used to determine the population and human health baseline. These include statistics on demographics and employment from the ONS, health statistics from Public Health England (now known as UK Health Security Agency), and Newark & Sherwood District Council local authority data on land use and resources.
- 12.8.2 A desk survey, utilising Ordnance Survey AddressBase data, has also been carried out to identify private property and housing, businesses, and community land and assets.
- 12.8.3 To determine frequency of use, WCH flow surveys have been carried out on PRoW in proximity to the Scheme. Details of these surveys are provided in Appendix 12.1 (Walker, Cyclist and Horse-rider (WCH) Survey Results) of the ES Appendices [REP4-009].
- 12.8.4 Surveys relevant to determinants of human health such as noise or air quality have been undertaken by the relevant environmental topic assessments. Details of these surveys are provided within Chapter 5 (Air Quality) and Chapter 11 (Noise and Vibration) of this ES.

Population

- 12.8.5 Newark-on-Trent is a market town in the Newark and Sherwood district of Nottinghamshire, approximately 27 kilometres north-east of Nottingham. The population of the LIA is 9,759. Table 12-7 shows the population structure of the LIA, Newark-on-Trent and Sherwood (WIA), East Midlands and England. Further information on population demographics can be found in Appendix 12.2 (Population and Human Health Supplementary Information) of the ES Appendices [REP3-018].

- The proportion of children (those under 16) in the LIA is 16%. This is in line with figures for the WIA (17%), and the East Midlands (18%) and England (19%).
- The proportion of young people (aged between 16 and 24 years) in the LIA is 10%. This is in line with figures for the WIA (9%), East Midlands and England (both 11%).
- The proportion of people of working age (between 16 and 64 years) in the LIA is 64%, in line with figures for the East Midlands and England (62% and 63% respectively). It is higher than the working age population in the WIA (60%)
- The proportion of older people in the LIA is 20%. This is in line with figures within the WIA (23%), regionally (20%), and nationally (18%).

Table 12-7: Demographic structure of the LIA

	Total population (2021)	Children (<16 years)	Young people (16-24 years)	Working age (16-64 years)	Older people (65+ years)
LIA	9,759	16%	9%	64%	20%
WIA	122,954	17%	9%	60%	23%
East Midlands	4,880,056	18%	11%	62%	20%
England	56,490,045	19%	11%	63%	18%

Source: Census 2021- ONS

Land use and accessibility

Residential property and housing

- 12.8.6 The LIA covers the central area of the town of Newark-on-Trent. There are approximately 5,010 residential properties within this study area, with the most common type of property being terraced housing (see Figure 12.3 (Residential Properties within the Local Impact Area) of the ES Figures [[AS-068REP5-019](#)]).
- 12.8.7 Key communities near to the Scheme are Newark-on-Trent to the south-west of the Scheme, accessed from the A46 via Farndon Road; Great North Road, and Lincoln Road; the village of Winthorpe, located to the north-east of the Scheme, accessed via the A1133; and the village of Farndon at the south-west end of the Scheme.

Community land and assets

- 12.8.8 There are multiple community resources located within the LIA. This includes 26 leisure or sports facilities, four schools, eight nurseries, one college, and five places of worship (see Figure 12.4 (Community Land and Assets within the Local Impact Area) of the ES Figures [[AS-](#)

069]). There are no existing severance issues between these community resources and the communities they serve.

12.8.9 The community resources include those listed below:

Educational facilities

- Lovers Lane Primary School, Warburton Street, approximately 350 metres to the south of the Scheme
- Bishop Alexander Primary School, Alexander Avenue, approximately 210 metres to the south of the Scheme
- Winthorpe Primary School, Thoroughfare Lane, approximately 180 metres to the north-east of the Scheme
- Children 1st at Newark, Great North Road, approximately 200 metres to the north of the Scheme
- Rainbow Day Nursery, Great North Road, approximately 100 metres to the north of the Scheme
- Lemon Tots, Brockton Avenue, approximately 170 metres west of the Scheme

Places of worship

- All Saints' Church Winthorpe, Gainsborough Road, approximately 130 metres to the north of the Scheme
- Church of St Michael and All Angels Averham, Church Lane, approximately 410 metres west of the Scheme
- St Wilfrid's Church, Main Road, 110 metres north of the Scheme

Community services

- Winthorpe Community Centre, Woodlands, approximately 430 metres to the north-east of the Scheme
- Castle Station Resources Centre, Mather Road, approximately 30 metres to the south of the Scheme

Leisure facilities

- Newark-on-Trent Rugby Club, Kelham Road, located approximately 180 metres to the north-west of the Scheme
- Newark-on-Trent Showground, Lincoln Road, approximately 200 metres to the south-east of the Scheme
- Newark-on-Trent Indoor Bowls Centre, Lincoln Road, approximately 20 metres to the south of the Scheme
- Farndon Cricket Club, Marsh Lane, approximately 430 metres to the south-west of the Scheme
- Kings Waterside and Marina, Mather Road, approximately 40 metres east of the Scheme
- Newark Martial Arts, Castle Gate, approximately 450 metres south-east of the Scheme
- Newark Rowing Club, Farndon Road, approximately 340 metres east of the Scheme

- Arena Health and Fitness UK, Warwick Brewery, approximately 190 metres south of the Scheme
- 776 Gymnastics Academy, Malt Park, 20 metres south of the Scheme
- Robin Hood Entertainment and Soft Play, Malt Park, 45 metres south of the Scheme
- Express Leisure Karting, Fosse Road, 10 metres east of the Scheme

Development land and businesses

- 12.8.10 The Development Plan for the Newark-on-Trent and Sherwood district comprises the Amended Core Strategy (adopted 7 March 2019)²⁴ and Allocations & Development Management (adopted 16 July 2013) Development Plan Documents.²⁵
- 12.8.11 Within the LIA the Newark-on-Trent and Sherwood Local Plan outlines plans for strategic sites, open breaks, sites of interest in nature conservation, housing sites with planning permission, public open spaces, employment sites with planning permission, housing allocations, Spatial Policy 7 transport Schemes, and mixed-use allocations.
- 12.8.12 The following development sites were identified within the LIA:
- Three employment allocations
 - Four housing allocations
 - Two mixed use allocations
 - A proposed solar panel farm and battery energy storage system site
 - The transport Scheme, Newark-on-Trent Flyover, which is supported by Policy 7 in the Amended Core Strategy (2019)
- 12.8.13 A total of 674 businesses are located within the LIA. This includes 358 shops and a further 38 retail enterprises reflecting the LIAs location within the centre of a market town (see Figure 12.5 (Businesses within the Local Impact Area) of the ES Figures [~~AS-070~~REP5-020]).
- 12.8.14 There is a large retail outlet on Lincoln Road Bridge which is home to a number of shops including TK Maxx, Curries, Homebase, Marks and Spencer Simply Food, and Boots.
- 12.8.15 The historic town centre is a large retail and hospitality area, and there are a number of hospitality venues such as Starbucks, Wetherspoons, Costa Coffee and independent venues.

²⁴ Newark & Sherwood District Council, 2019. Amended Core Strategy. Available at: <https://www.newark-sherwooddc.gov.uk/media/nsdc-redesign/documents-and-images/your-council/planning-policy/local-development-framework/amended-core-strategy-dpd/amended-core-strategy-DPD.pdf> (last accessed December 2023).

²⁵ Newark & Sherwood District Council, 2013. Allocations & Development Management Plan. Available at: <https://www.newark-sherwooddc.gov.uk/media/nsdc-redesign/documents-and-images/your-council/planning-policy/supplementary-planning-information/allocations-and-development-management-dpd/Allocations-and-Development-Management-Development-Plan-Document.pdf> (last accessed December 2023).

- 12.8.16 The LIA is also home to manufacturing and industrial businesses, including Apollo Engineering Technology, British Sugar, and DX Freight.

Agricultural land holdings

- 12.8.17 There are approximately 14 farms with land in the LIA (Farms 1-4, 6-12 and 14-16 in Figure 12.6 (Agricultural Land Impact Plan) of the ES Figures [REP3-015])²⁶. These are a mixture of freehold and leasehold. Much of the land within the LIA is used for arable production or horse grazing. No existing severance issues have been identified regarding agricultural land holdings within the study area.

Walkers, cyclists and horse riders

- 12.8.18 This section outlines the WCH provision within the LIA. Data on the location of routes was obtained from Newark & Sherwood District Council.
- 12.8.19 According to Newark & Sherwood District Council PRow data, there are a number of WCH routes (footpaths and bridleways) in the LIA (see Figure 12.7 (Open Space and Outdoor Recreational Facilities within the Local Impact Area) of the ES Figures [REP3-015]). These include:
- Newark-on-Trent BW2: Bridleway following the southern side of the River Trent
 - Newark-on-Trent BW5: Bridleway following on from BW5 along the southern side of the River Trent
 - Newark-on-Trent BW6: Bridleway following on from BW6 along the southern side of the River Trent
 - Winthorpe FP2: Footpath through Winthorpe village to the A46
 - Winthorpe FP3: Footpath from east side of A46 through Showground
 - Newark FP14: Footpath from Kelham Road east through fields and across A46
 - Footpath/cycleway along Great North Road: Following the Great North Road northbound out of Newark and across the A46
 - Newark FP48: Footpath southbound from River Trent, under the A46 to Quibell's Lane
- 12.8.20 With the exception of Newark FP14, the remaining listed WCH routes are not affected by severance.
- 12.8.21 Newark FP14 is routed across the A46. This requires users to traverse through fields, stepped footpaths and over a busy road, which may contribute to a lower number of users along this route. The existing A46 is therefore considered to cause a severance effect on this WCH route.

²⁶ [Due to ongoing design changes, of the total 16 farms originally impacted, only 14 remain impacted.](#)

- 12.8.22 Long distance walking routes also pass through the LIA. The Trent Valley Way, a long-distance walking route along the length of the River Trent, approaches the centre of Newark from the west, before crossing the river and continuing north-east through the town centre.
- 12.8.23 According to Sustrans National Cycle Network data, National Cycle Network Route 64 passes within the LIA.
- 12.8.24 Further information on WCH flows along the routes identified above can be found in Appendix 12.1 (Walker, Cyclist and Horse-rider Survey Results) of the ES Appendices [REP4-009].

Human Health²⁷

Human health profiles of affected communities

Deprivation and employment indicators

- 12.8.25 The England Indices of Multiple Deprivation (IMD) is used for the measurement and comparison of relative levels of deprivation. Table 12-8 shows the income deprivation quintiles across the LIA, Newark-on-Trent and Sherwood (WIA), East Midlands, and England.
- 23% of the population of the LIA live within the most deprived quintile. This is considerably higher than the figure for the WIA (14%) and the East Midlands (18%), but in line with the figure for England (20%).
 - 39% of the population of the LIA live within the second most deprived quintile. This is considerably higher than figures for the WIA (19%), the East Midlands (20%), and England (21%).
 - None of the population within the LIA live within the least deprived quintile. This is considerably lower than in the WIA (17%), the East Midlands (22%), and England (19%).

Table 12-8: Deprivation indicators

Location	Most deprived quintile	Second most deprived quintile	Third most deprived quintile	Fourth most deprived quintile	Least deprived quintile
LIA	23%	39%	5%	37%	0%
WIA	14%	19%	28%	22%	17%
East Midlands	18%	20%	19%	21%	22%
England	20%	21%	20%	20%	19%

Source: ONS Census 2021 and MHCLG 2019 Indices of Multiple Deprivation

²⁷ When comparing data for different regions, where the LIA deviates by more than 3% the difference is considered to be considerable and is reported as such. This is based on professional judgement.

12.8.26 Table 12-9 shows key unemployment indicators across the WIA, the East Midlands and England. Data for the LIA is not available.

- The economic activity rate for the WIA is 72%. This is considerably lower than figures for the East Midlands (78%) and England (79%).
- The unemployment rate for the WIA is 7%. This is in line with figures for the East Midlands (5%) and England (5%).
- The average proportion of the working age population claiming Jobseekers Allowance (JSA) and Universal Credit monthly within the LIA is 4%. This is in line with figures for the WIA (4%), East Midlands (4%) and England (4%).

Table 12-9:Economic and Employment Baseline Data

Location	Economic activity rate - 16 to 64 year olds	Employment rate - 16 to 64 year olds (%)	Unemployment rate - 16 to 64 year olds (%)	% of working age population claiming JSA and UC monthly on average
LIA	Not available	Not available	Not available	5%
WIA	72%	67%	7%	3%
East Midlands	78%	74%	5%	3%
England	79%	75%	5%	4%

Source: ONS Annual Population Survey 2021

Health indicators

12.8.27 Table 12-10 presents key health indicators within the LIA, Newark-on-Trent and Sherwood (WIA), East Midlands, and England.

- The indicators for the LIA (where available) and Newark-on-Trent and Sherwood (WIA) broadly align with the equivalent data presented for the East Midlands and England.
- However, at 69.1 deaths per 100,000 population, the under 75 mortality rate from cardiovascular disease across the district is slightly lower than the regional and national average (75.7 and 73.8 deaths per 100,000 respectively).
- In contrast, the under 75 mortality rate from all respiratory disease is higher than the regional and national rates.
- The percentage of physically active adults is considerably higher for Newark-on-Trent and Sherwood (73%) than the region (65%) and national (66%) proportions.

Table 12-10: Health indicators

Measure	LIA	WIA	East Midlands	England
Long-term health problem or disability (2021) (%)	19%	20%	18%	17%
Life expectancy at birth (male 2018-20) (years)	Not available	79.8%	79.2%	79.4%
Life expectancy at birth (female 2018-20) (years)	Not available	82.7%	82.7%	83.1%
Physically active adults (% 2018-20)	Not available	73%	65%	66%
Under 75 mortality rate from all cardiovascular disease (deaths per 100,000)	Not available	69.1%	75.7%	73.8%
Under 75 mortality rate from all respiratory disease (deaths per 100,000)	Not available	33.7%	29.5%	29.4%
Mortality rate from Chronic Obstructive Pulmonary Disease (COPD) (deaths per 100,000)	Not available	45.1%	53.6%	52.6%
Percentage of population in bad or very bad health (2021)	5%	6%	5%	5%

Sources: Census 2021; ONS Life expectancy at birth and age 65; Public Health England Mortality Profile 2020; Public Health England Physical Activity 2020-2021

Health determinants

12.8.28 Health determinants include the range of personal, social, economic, and environmental factors that influence human health status.²⁸ DMRB LA 112 specifies the indicative types of human health determinants, which include:

- Air quality management areas and ambient air quality
- Noise sensitive areas
- Sources and pathways of potential pollution
- Landscape amenity
- Safety information associated with the existing road
- Information from stakeholder consultation
- Outline spatial characteristics of the transport network and usage in the area

12.8.29 It additionally includes:

- The location and type of community, recreational and education facilities and severance/separation of communities from such facilities

²⁸ UK Government (2017) Chapter 6: social determinants of health. Available at: [Chapter 6: social determinants of health - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/social-determinants-of-health) (last accessed December 2023).

- The location of green and open space and severance/separation from such facilities
- The location of healthcare facilities and severance/separation from such facilities

12.8.30 Community facilities located within 500 meters of the Scheme are provided below. Under the current configuration, these community assets do not experience any severance from the communities they serve.

Community, recreational and education facilities

12.8.31 The community, recreational and educational facilities within the LIA are listed in paragraph 12.8.9 above and Appendix 12.2 (Population and Human Health Supplementary Information) of the ES Appendices [REP3-018].

Green/open space

12.8.32 There are 25 open space and outdoor recreational facilities within the LIA (see Figure 12.7 (Open Space and Outdoor Recreational Facilities within the Local Impact Area) of the ES Figures [AS-072]). These include:

- Sconce and Devon Park, Boundary Road, located approximately 500 metres to the south-west of the Scheme
- Millgate Otter Park, approximately 400 metres to the south-east of the Scheme

Healthcare facilities

12.8.33 There are six healthcare facilities and hospitals within the LIA, amongst which are:

- The Red Rose Care Community Nursing Home, Brockton Avenue, located approximately 135 metres east of the Scheme
- Branching Out Young Persons Service, Kings Road, approximately 440 metres south of the Scheme
- Strawberry Fields Residential Care Home, Strawberry Hall Lane, located approximately 400 metres east of the Scheme
- Kirkgate Dental Surgery, Kirk Gate, located approximately 135 metres south of the Scheme
- The Farndon Unit, Farndon Road, located approximately 20 metres to the east of the Scheme

Transport network

12.8.34 The A46 connects Somerset with Lincolnshire via the West Midlands, passing close to Bath, Coventry, Leicester, and Newark-on-Trent. The A46 is approximately 350 kilometres long and provides connectivity within the LIA and WIA between Newark-on-Trent, Farndon, and

Winthorpe. Within the LIA, the A46 is crossed by Great North Road, the A1, and the A1133.

- 12.8.35 The A46 is located near to the two main railway stations in the local area, Newark Castle station and Newark Northgate station, both operated by East Midlands Railway. Newark Castle provides regular services across the East Midlands and two trains per day to London. Newark Northgate is served by intercity trains to London, Newcastle and Edinburgh as well as Lincoln.
- 12.8.36 The bus network operating within the LIA operates from Newark-on-Trent Bus Station and provides connectivity between Lincoln, Nottingham, and Grantham. The services include:²⁹
- Bus 47: Lincoln
 - Bus 90/A: Nottingham
 - Bus 28: Mansfield
 - Bus 24: Grantham

Air quality management

- 12.8.37 There are no Air Quality Management Areas (AQMAs) currently designated within the Newark & Sherwood District Council area (WIA).

Noise

- 12.8.38 As outlined in Chapter 11 (Noise and Vibration) of this ES, several Noise Important Areas are located in the vicinity of the Scheme, eight of which are within the LIA (see Figure 11.3 (Noise Important Areas) of the ES Figures [AS-057]):
- 7834 (Langford, A46)
 - 7838 (Newark-on-Trent, A1)
 - 7839 (Newark on Trent, A46)
 - 7840 (Newark-on-Trent, A46)
 - 7846 (Farndon, A46)
 - 7847 (Farndon, A46)
 - 8220 (Newark-on-Trent, A46/A1)
 - 11256 (Kelham)
- 12.8.39 The closest noise sensitive receptors adjoining the A46 (as listed in Chapter 11 (Noise and Vibration) of this ES, are exposed to background noise - largely consisting of road traffic noise and noise from the railways, dependent on the time of day.

²⁹ Nottinghamshire Country Council (2022). *Newark Bus Station*. Accessed at: <https://www.nottinghamshire.gov.uk/transport/public-transport/bus-stations/newark-bus-station> (last accessed December 2023).

Land quality

- 12.8.40 The baseline land quality conditions are summarised in Chapter 9 (Geology and Soils) of this ES. The Scheme is situated within an existing highway network comprising carriageway, roundabouts and junctions, with surrounding agricultural, residential, commercial and industrial land.

Landscape amenity

- 12.8.41 The Scheme falls within National Character Area (NCA) 48 Trent and Belvoir Vales, which is detailed further in Chapter 7 (Landscape and Visual Effects) of this ES.

12.9 Potential impacts

- 12.9.1 The following potential impacts from the Scheme have been identified for both construction and operation stages.

Construction impacts

Land use and accessibility

- 12.9.2 The construction of the Scheme will require permanent land take from a residential property within the Order Limits. The residential unit sits within the abandoned Mint Leaf Restaurant and is known to be uninhabited. The council tax banding for the 'Flat above Mint Leaf Indian Restaurant' was 'Deleted' with effect from 16th November 2023³⁰.
- 12.9.3 The construction of the Scheme will require both permanent and temporary land take from businesses and development land in the Newark area within the Order Limits.
- 12.9.4 The construction of the Scheme will require both permanent and temporary use of agricultural land along the route within the Scheme footprint, potentially impacting on the functioning and viability of agricultural holdings and enterprises.
- 12.9.5 Construction of the Scheme will require changes in road layouts, temporary diversions and road closures throughout the construction period. Changes to access, as well as increases in traffic from construction activities, may affect access to a number of receptors within the LIA particularly in terms of increased journey time and associated community severance.
- 12.9.6 Several receptors within the LIA fall within the Scheme's Order Limits and are, therefore, likely to experience some temporary disruption

³⁰ Gov.uk (2025) Check Council Tax Band. Available at: <https://www.tax.service.gov.uk/check-council-tax-band/property/927c25ea-0056-7c90-94c4-6d0a76f3150d> Last accessed: January 2025.

during the construction period. Haul routes within the Order Limits are shown on Figure 2.4 (Locations of Temporary Works Areas Required During Construction) of the ES Figures [AS-027].

- 12.9.7 Temporary diversions or closures of WCH routes (including PRow, footways, road crossings and long-distance routes) will be needed within the LIA. This would result in changes to accessibility and increases to journey lengths for WCH potentially introducing severance for communities.

Human Health

- 12.9.8 Temporary creation of jobs necessary to deliver the Scheme will have direct and indirect beneficial employment-related health impacts in the WIA.
- 12.9.9 Temporary changes to the local environment (increase of noise, decrease of air quality, landscape, severance) will affect the health and wellbeing of communities.

Operation

Land use and accessibility

- 12.9.10 Some new WCH provision will be delivered as part of the Scheme, including a new walking/cycleway between Winthorpe FP2 and FP3 across the A46. These could reduce severance resulting in a benefit for cyclists, walkers and other vulnerable road users wishing to cross the A46 within the LIA.

Human health

- 12.9.11 The Scheme has the potential to improve the provision of infrastructure that encourages active travel modes, supports a potential reduction in pollutants and offers access to employment with the potential for positive health impacts.
- 12.9.12 The operation of the Scheme is anticipated to reduce congestion, improve journey time reliability and improve safety, improving the access to employment for people living within the LIA and supporting the future economic growth of the region.
- 12.9.13 The Scheme has the potential to cause changes to the local environment (increase of noise, decrease of air quality, landscape, severance) which may affect the health and wellbeing of communities.

12.10 Design, mitigation and enhancement measures

Design measures

12.10.1 The development of the Scheme design has been an iterative process undertaken through an integrated design team to adhere to the principles of the design and mitigation hierarchy outlined in DMRB LA 104: Environmental Assessment and Monitoring.³¹ The first principle being to avoid potential adverse effects, if at all possible, before seeking to minimise or mitigate for any unavoidable impacts through a well-developed mitigation strategy. Embedded mitigation for the Scheme is set out in Chapter 2 (The Scheme) of this ES. Embedded mitigation measures incorporated in the Scheme design include minimising land take, integrating WCH infrastructure into the Scheme, providing signage for temporary and permanent diversions, and maintaining access.

Mitigation measures – construction

12.10.2 Mitigation measures during construction are included or referenced within the First Iteration Environmental Management Plan (EMP) [~~REP4-010~~REP6-012] which will be developed into a Second Iteration EMP for implementation during construction of the Scheme. A Construction Communications Management Plan will also be prepared in full as part of the Second Iteration EMP prior to construction commencing. Details on the First and Second Iteration EMPs, including how mitigation is secured within the draft DCO [~~REP4-003~~REP6-004], is provided within Section 4.4 of Chapter 4 (Environmental Assessment Methodology) of this ES. Mitigation measures of relevance to population and human health during construction include the following:

- An Outline TMP [~~REP3-026~~REP6-018] has been prepared for the Scheme. In accordance with Requirement 11 of the draft DCO [~~REP4-003~~REP6-004], a Traffic Management Plan (TMP) would be implemented during the construction phase of the Scheme, to ensure that access is maintained to private property, businesses, community land and facilities and WCH routes as well as access to green and open spaces and disruption is minimised as far as possible
- A Construction Communications Management Plan would be prepared for the Scheme to ensure stakeholders and local people are kept up to date and informed during construction.

³¹ National Highways (2020) DMRB LA 104 – Environmental Assessment and Monitoring, Revision 1 [online] available at: [LA 104 - Environmental assessment and monitoring \(standardsforhighways.co.uk\)](https://standardsforhighways.co.uk/LA-104-Environmental-assessment-and-monitoring) (last accessed December 2023).

- Provision of appropriate signage for temporary WCH diversions, including wayfinding and duration of works.
- 12.10.3 Details regarding construction phase traffic management and diversion routes for highways and WCH routes are set out in Appendix 12.2 (Population and Human Health Supplementary Information) of the ES Appendices [REP3-018].
- 12.10.4 As noted above, a Construction Communications Management Plan will ensure that local people and businesses will be engaged with and kept abreast (including bus companies) about how construction may impact them, for example through road diversions.

Mitigation measures – operation

- 12.10.5 Mitigation measures of relevance during operation include the following:
- Provision of appropriate signage for new or permanently diverted WCH routes.
 - Access to all affected residential properties, agricultural land, businesses and areas of open space and recreation will be maintained.

Enhancement measures

- 12.10.6 Consideration has been given throughout the design development to any potential for enhancement opportunities in relation to population and human health.
- 12.10.7 The following enhancement measures for the construction and operation of the Scheme have been included in the design:
- Opportunities to rectify existing severance problems in the area and encourage greater use of WCH routes.
 - Access in and around new junctions to accommodate walking, cycling and horse-riding as required.
 - An Education, Employment and Skills Plan and an Inclusion Action Plan will also be prepared in full as part of the Second Iteration EMP prior to construction commencing.
- 12.10.8 These enhancement measures have not been taken into account when determining the significance of effects because they are over and above what is required to mitigate the adverse effects of the Scheme.

12.11 Assessment of likely significant effects

- 12.11.1 The assessment of likely significant effects considers effects on population and human health receptors during construction and operation. These effects are determined following the incorporation of the essential mitigation measures outlined in Section 12.10 and embedded mitigation measures in Chapter 2 (The Scheme) of this ES. These mitigation measures are secured in the First Iteration EMP [~~REP4-010~~REP6-012].

Construction impacts on land use and accessibility

Temporary or permanent land requirements

- 12.11.2 Construction of the Scheme requires land take from development land and businesses and agricultural land holdings within the LIA. Land required would either be temporarily used for construction activities such as compounds and heavy goods vehicles (HGV) access routes or taken permanently to provide space for the new Scheme footprint. Land take effects during construction are detailed in Table 12-11.

Table 12-11: Land take effects during construction

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
Private property and housing	Former Mint Leaf, Winthorpe	Low – the property is uninhabited and sits within the premises of an abandoned commercial building. The land required does not fall within land allocated for housing. The council tax banding for the 'Flat above Mint Leaf Indian Restaurant' was 'Deleted' with effect from 16th November 2023.	A Satellite Construction Compound for the construction of the Scheme requires the demolition, and therefore loss, of one residential property.	Negligible – The loss of one residential property results in a very minor loss to the overall housing stock. Additionally, the property has been uninhabited for several years, therefore would not result in the displacement of residents.	N/A	Neutral
Community land and assets	No temporary or permanent land take is required from community land and assets as a result of the construction of the Scheme.					

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
Development land and businesses	Former Nottinghamshire County Council Highways Depot, Great North Road	High- The land is allocated for employment and is between 1 and 5 hectares (2.07 hectares)	The Main Construction Compound for the construction of the Scheme requires 2.07 hectares from the former Nottinghamshire County Council Highways Depot at Great North Road. The land is designated as employment land under the Newark & Sherwood Development Plan and will be used as the Main Construction Compound for 48 months to facilitate works during construction.	Minor- While the land will be used for 48 months, there is unlikely to be a permanent change to the viability of the land for employment uses after this period. A planning application is additionally not on this site at present. The land will be returned to its current state.	N/A	Slight Adverse (not significant)
	Land North of the A17 at Newark Showground	Very high- The land is allocated for employment uses and is over 5 hectares (23 hectares)	The widening of the A46 requires permanent land take of 0.3 hectares from land north of the A14 at Newark Showground. The land is allocated for Mixed Use Development to accommodate a hotel, restaurant and other employment uses, for which planning permission has been granted.	Negligible- While the land take is permanent it represents 1.3% of the total site. As such it represents a minor loss to the site and should not directly affect the viability of the existing planning application.	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
	Briggs Metals Ltd	Medium- This is land associated with employment which covers one hectare	The satellite construction compounds for Smeatons Arches, and the upgrade of Cattle Market Junction, will temporarily require one hectare of land from Briggs Metals Ltd. This land is located north of Cattle Market Junction between the A617 and Great North Road, and is currently used for horse grazing. The plot of land will be required for 36 months and will be returned to its current owners following the construction period.	Negligible- Whilst the land is owned by the business it is not used for the business's activities or primary function. At present it is used to graze horses.	N/A	Slight Adverse (not significant)
	Land for proposed solar panel farm and battery energy storage system site	Very high – the development land spans in excess of 5 hectares and is undergoing the planning application process.	The Kelham and Averham Floodplain Compensation Area (FCA) will require 5.6 hectares of land from the development site for a proposed solar panel and battery energy storage system site, for a period of ten months. This represents 6% of the development site.	Negligible - Whilst the land is required to establish the FCA, this use is compatible with it being returned for alternative use and as such design solutions for the floodplain compensation areas have been developed in coordination and review with the	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
				developers and landowners of the solar panel development. As such the development of the Kelham and Averham FCA represents a likely temporary use of currently non-operational land and should not affect the viability of the proposal.		
	Shell Garage, A17 Winthorpe Roundabout	Medium- the Garage is an existing site of employment of less than one hectare	0.07 hectares of land will be permanently acquired from Shell to facilitate the realignment of the access route to this filling station. Access to the filling station will be maintained throughout the construction period	Negligible- As access will be maintained, the loss of land does not compromise overall viability of the business		Neutral (not significant)
	Esso Garage, Lincoln Road, Winthorpe Roundabout	Medium- the Garage is an existing site of employment of less than one hectare	The Esso Garage at Winthorpe Roundabout is not within the Order Limits and no land is required to facilitate the A46 upgrades.	No change- No land is required from the Esso garage to facilitate the A46 upgrades		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
Agricultural land holdings	Farm 01	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	The widening of the A46 and the creation of floodplain compensation areas and attenuation basins will permanently require approximately 47 hectares of land from Farm 01. This land is made up of land parcels in two locations: on either side of the A46 just north of Farndon Roundabout; and further land to the north east of Cattle Market Junction. This represents 36% of this landowner's 130.5 hectares of farmland within the LIA.	Major- 36% of the farm's land within the LIA will be permanently acquired	N/A	Large Adverse (significant)
	Farm 02	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	The construction of the Brownhills junction, embankments, attenuation basins and a new shared WCH route will permanently require approximately 14.5 hectares of land from Farm 02, which is located between the A46 and Winthorpe. This represents 12% of this landowner's 121.9 hectares of land within the LIA. Access to farmland outside of the Order Limits will be maintained	Moderate- 12% of the farm's land within the LIA will be permanently acquired.	N/A	Moderate Adverse (significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
			throughout the construction phase.			
			Construction activity to facilitate the construction of Brownhills junction, embankments, attenuation basins and a new shared WCH route will temporarily require the use of approximately 0.5 hectares of land from Farm 02, which is located between the A46 and Winthorpe. This represents 0.4% of this landowner's 121.9 hectares of land within the LIA. Access to farmland outside of the Order Limits will be maintained throughout the construction phase.	Negligible- 0.4% of the farm's land within the LIA to be temporarily affected	N/A	Slight Adverse (not significant)
	Farm 03	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	The Brownhills Borrow Pit will permanently require approximately 18 hectares of land from Farm 03. This land is located adjacent to the Nottingham to Lincoln Railway and the A1. This represents 7% of the landowners 252.1 hectares of farmland within the LIA.	Minor- 7% of the farm's land within the LIA will be permanently affected.	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
	Farm 04	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	The Kelham and Averham FCA will temporarily require the use of approximately 6 hectares of land from Farm 04 for a period of ten months to establish the land as FCA. The land is located in the village of Averham adjacent to the A617. This represents 5% of this landowner's 126 hectares of farmland within the LIA. Access to the rest of Farm 04 will be maintained throughout the construction phase. It is expected that land required temporarily during construction and to establish the FCA use will be returned to an agricultural use following the construction period.	Minor- 5% of the farm's land within the LIA will be affected for approximately ten months.	N/A	Slight Adverse (not significant)
	Farm 06	Medium- This land is key agricultural infrastructure (arable land) on which the farm enterprise is partially dependent.	The realignment of Winthorpe Roundabout and creation of new shared WCH route and embankments will require 0.23 hectares of land from Farm 06, which is located to the north east of Winthorpe Roundabout adjacent to the A46 and Drove Lane. This will be for temporary use but subject to permanent rights	Negligible- 0.3% of the farm's land will be permanently acquired but used temporarily	N/A	Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
			acquisition. This represents 0.3% of the landowner's 87.5 hectares of farmland within the LIA. Access to remaining parcels of land will be maintained.			
			The realignment of Winthorpe Roundabout and creation of new shared WCH route and embankments will permanently require 2.5 hectares of land from Farm 06. This represents 3% of the landowner's 87.5 hectares of farmland within the LIA. Access to remaining parcels of land will be maintained.	Minor- 3% of the farm's land within the LIA will be permanently affected		Slight Adverse (not significant)
			Construction works to facilitate the realignment of Winthorpe Roundabout will temporarily require the use of 1.7 hectares of land from Farm 06. This represents 2% of the landowner's 87.5 hectares of farmland within the LIA. Access to remaining parcels of land will be maintained.	Minor- 2% of the farm's land within the LIA will be temporarily affected		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
	Farm 07	Medium- This land is key agricultural infrastructure (arable land) on which the farm enterprise is partially dependent.	The Kelham and Averham FCA will require 2 hectares of land from Farm 07 to be used for a period of ten months to establish the FCA, however rights will be permanently acquired in order to access a drainage ditch. This land is located in the village of Averham, on the eastern side of the A617. This represents 4% of the landowners 50 hectares of farmland within the LIA. Access to farmland and businesses outside of the Order Limits will be maintained.	Minor- 4% of the farms land will be subject to permanent rights acquisition but required for temporary use to establish the FCA.	N/A	Slight Adverse (not significant)
			The Kelham and Averham FCA will permanently require 7.5 hectares of land from Farm 07. This represents 15% of the landowners 50 hectares of farmland within the LIA.	Moderate - 15% of the farm's land within the LIA will be permanently acquired		Moderate Adverse (significant)
	Farm 08	High- This land is key agricultural infrastructure (arable land) on which the	Farm 08 is located on the western side of the A46 just north of Farndon Roundabout. Land required to facilitate the environmental mitigation will temporarily require the use of	Negligible- 0.5% of the farm's land within the LIA will be temporarily affected for 36 months	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
		farm enterprise is dependent.	approximately 0.1 hectares of land from Farm 08 for approximately 36 months. Land required temporarily will be reinstated following the construction period. This represents 0.5% of this landowner's 14.3 hectares of farmland within the LIA.			
			Land required for environmental mitigation will permanently require approximately 1 hectares of land from Farm 08. This represents 7% of this landowner's 14.3 hectares of farmland within the LIA.	Minor- 7% of the farm's land within the LIA will be permanently affected		Slight Adverse (not significant)
	Farm 09	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	Affected land from Farm 09 is located on both sides of the A46 to the west of Cattle Market Junction. Construction works to facilitate the upgrade of Cattle Market Junction and the creation of attenuation basins and access and maintenance tracks will temporarily require the use of approximately 0.08 hectares of land from Farm 09. Land temporarily used will be	Negligible- 0.9% of the farm's land within the LIA will be temporarily affected	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
			reinstated following the construction period. This represents 9% of the landowners 8.2 hectares of farmland within the LIA.			
			The works at Cattle Market Junction will also require 0.03 hectares of land. This will be used temporarily but the rights will be permanently acquired. This represents 0.3% of the landowners 8.2 hectares of farmland.	Negligible - 0.3% of the landowners farmland will be used temporarily but will be subject to permanent rights acquisition	N/A	Slight Adverse (not significant)
			The upgrade of Cattle Market Junction and the creation of attenuation basins and access and maintenance tracks will permanently require approximately 5 hectares of land from Farm 09 – located directly north west of Cattle Market Junction, adjacent to both the A46 and A617. This consists of six fields acquired in their entirety. This represents 61% of the landowners 8.2 hectares of farmland within the LIA.	Major- 61% of the farm's land within the LIA will be permanently affected.	N/A	Large Adverse (significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
	Farm 10	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	The upgrade of Cattle Market Junction and access and maintenance tracks for construction vehicles will permanently require approximately 1.6 hectares of land from Farm 10, which is located to the west of Cattle Market Junction on the south side of the A46. This represents 31% of the landowners approximately 5.3 hectares of farmland within the LIA. Access to farmland outside of the Order Limits will be maintained.	Major- 31% of the landowner's land within the LIA will be permanently affected.	N/A	Large Adverse (significant)
			The upgrade of Cattle Market Junction will also require 0.01 hectares of land temporarily from Farm 10. This represents 0.2% of the landowner's approximately 5.3 hectares of farmland within the LIA.	Negligible - 0.2% of the farm's land within the LIA will be temporarily affected	N/A	Slight Adverse (not significant)
			The upgrade of Cattle Market Junction will additionally require 0.01 hectares of land which will be used temporarily but the rights will be permanently acquired. This represents 0.2% of the	Negligible - 0.2% of the landowner's farmland will be used temporarily but will be subject to	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
			landowner's approximately 5.3 hectares of farmland within the LIA.	permanent rights acquisition		
	Farm 11	High- This land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent.	Land required for attenuation basins will permanently require 1.3 hectares of land from Farm 11, which is located directly north of the Nottingham to Lincoln Railway Line (NLRL) and west of the A46. This represents 4% of this landowner's 36.7 hectares of farmland within the LIA.	Minor - 4% of this land will be affected permanently.	N/A	Slight Adverse (not significant)
			Land required for the satellite compound for NLRL west crossing (north) will temporarily require the use of 1.4 hectares of land from Farm 11 which is located to the north of the NLRL. This represents approximately 4% of this landowner's 36.7 hectares of farmland within the LIA. Access to farmland outside of the Order Limits will be maintained throughout the 36 month construction period. Land required temporarily will	Minor- 4% of this land will be temporarily affected for approximately 36 months.	N/A	Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
			be reinstated following the construction period.			
	Farm 12	Medium- This land is key agricultural infrastructure (arable land for grazing) on which the farm enterprise is partially dependent	Construction works to facilitate the upgrades at Cattle Market Junction will temporarily require the use of 0.01 hectares of land. This land is located directly north of Cattle Market Junction to the west of the A616. This represents 0.3% of this landowner's 4.9 hectares of farmland within the LIA	Negligible- 0.3% of this land will be temporarily affected	N/A	Neutral (not significant)
			Upgrades at Cattle Market Junction will permanently require 0.14 hectares of land. This represents 3% of this landowner's 4.9 hectares of farmland within the LIA	Minor- 3% of this land will be permanently affected	N/A	Slight Adverse (not significant)
			Upgrades at Cattle Market Junction will require the temporary use of 0.02 hectares of land, although the rights will be subject to permanent acquisition. This represents 0.5% of this landowner's 4.9 hectares of farmland within the LIA	Negligible - The rights to 0.5% of this landowners farmland will be permanently acquired, although it will be used only temporarily	N/A	Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
	Farm 14	High- This land is key agricultural infrastructure (arable land for grazing) on which the farm enterprise is dependent.	Farm 14 is located immediately north of Winthorpe Roundabout between the A1133 and the A46. The creation of the new access route to Langford Hall will temporarily require the use of 2.2 hectares of land from Farm 14 for approximately 36 months. This represents 13% of this landowner's 17.2 hectares of farmland within the LIA. Land required temporarily will be reinstated following the construction period.	Moderate- 13% of the farm's land within the LIA will be temporarily affected for approximately 36 months.	N/A	Moderate Adverse (significant)
			Farm 14 is located immediately north of Winthorpe Roundabout. The realignment of Winthorpe Roundabout and planting for permanent landscape bunds will permanently require 2.7 hectares of land from Farm 14. This represents 15% of the landowner's 17.2 hectares of farmland within the LIA.	Moderate- 15% of the farm's land within the LIA will be permanently affected	N/A	Moderate Adverse (significant)
	Farm 15	High- This land is key agricultural	Land immediately west of Quibell's Lane is to be temporarily used to facilitate	Major- 24% of the landowners farmland within the	N/A	Large Adverse (significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude of impact	Additional mitigation/enhancement	Significance of residual effect
		infrastructure (arable land for grazing) on which the farm enterprise is dependent.	construction access routes. 2.3 hectares of land will be temporarily used, which represents 24% of the landowners 9.8 hectares of land within the LIA.	LIA will be temporarily required		
			Land immediately west of Quibell's Lane is to be temporarily used to facilitate construction access routes. 0.14 hectares of land will be temporarily used, but will be subject to permanent rights, which represents 1.4% of the landowners 9.8 hectares of land within the LIA.	Minor- 1.4% of the landowners farmland within the LIA will be subject to permanent rights but used temporarily	N/A	Slight Adverse (not significant)
	Farm 16	High- This land is key agricultural infrastructure (arable land for grazing) on which the farm enterprise is dependent.	Affected land on Farm 16 is located adjacent to the A46 between Cattle Market Junction and Winthorpe Roundabout. One field within Farm 16 will be permanently required to facilitate the widening of the A46. 2.3 hectares will be permanently acquired, which represents 17% of the landowner's 13.4 hectares of farmland within the LIA.	Moderate- 17% of the landowners farmland within the LIA will be permanently required	N/A	Moderate Adverse (significant)

Temporary changes in access

- 12.11.3 Construction of the Scheme would require changes in road layouts, temporary diversions and road closures throughout the construction period. Changes to access, as well as increases in traffic from construction activities, may affect access to a number of receptors within the LIA particularly in terms of increased journey time and associated community severance. Access effects during construction are detailed in Table 12-12.

Table 12-12: Access effects during construction

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
Private property and housing	Residential properties accessed via Fosse Road and Crees Lane	High - Due to daily use	The enlargement of Farndon Roundabout to facilitate an additional lane will temporarily impact 300 metres of Fosse Road for approximately 42 months. This will impact access to local properties which are accessed via Fosse Road and Crees Lane.	Negligible - Access will be maintained and any delays experienced will be minimal.	As outlined in Section 12.10, a TMP would be implemented during the construction phase of the Scheme, to ensure that access is maintained and disruption is minimised as far as possible. As outlined in Section 12.10, local people and businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through road diversions.	Slight Adverse (not significant)
	Residential properties accessed via Kelham Road	High - Due to daily use	The reconfiguration of Cattle Market Roundabout, slip roads, and the A46 to the west of Cattle Market Roundabout will temporarily affect 350 metres of Great North Road up to Kelham Road for approximately 42 months. Kelham Road additionally borders the Main Construction Compound and will be used as a haul route.	Negligible - Access will be maintained and any delays experienced will be minimal.		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
			Consequently, residents using Kelham Road to access their properties may experience some disruption and/or delays.			
	Residential properties accessed via Mather Road, including residential moorings at Kings Road Marina	High - Due to daily use	Mather Road will be used as a haul route for the construction activities at Nether Lock Viaduct. Consequently, residents using Mather Road to access their properties may experience some disruption and/or delays as a result of increased construction traffic.	Negligible - Access will be maintained and any delays experienced will be minimal.		Slight Adverse (not significant)
	Residential properties accessed via Lincoln Road, including Harvest Drive and Wheatsheaf Avenue	High - Due to daily use	Construction activities at Brownhills junction will temporarily affect 100 metres of Lincoln Road and require the use of Harvest Road and Wheatsheaf Avenue as haul routes. Consequently,	Negligible - Access will be maintained and any delays experienced will be minimal.		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
			residents using these roads to access their properties may experience some disruption and/or delays as a result of increased construction traffic.			
	Residential properties accessed via Winthorpe Road: - Bridge House Farm - Old Stable Yard	High - Due to daily use	Construction of Brownhills Junction and associated slip roads will temporarily affect Winthorpe Road for approximately 36 months.	Minor - Winthorpe Road provides the sole access to Bridge House Farm and Old Stable Yard, however access will be maintained throughout the 36-month construction period and delays experienced will be minimal.		Slight Adverse (not significant)
	Residential properties in Winthorpe	High - Due to daily use	The realignment of Winthorpe Roundabout will temporarily affect 400 metres of the A1133, reducing access throughout the construction period.	Minor - The A113 is the primary route between Winthorpe and Newark-on-Trent and the A46, but access will be maintained throughout the construction period. Any delays		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
				experienced will be minimal.		
Community land and assets	Red Rose Care Community, Brockton Avenue	High - The receptors are likely used frequently (weekly) and there are limited local alternative facilities	The enlargement of Farndon Roundabout to facilitate an additional lane will temporarily impact 300 metres of Fosse Road for approximately 42 months. This will impact access to community land and assets which are accessed via Fosse Road such as Red Rose Care Community.	Negligible - Access will be maintained and any delays experienced will be minimal.	As outlined in Section 12.10, a TMP would be implemented during the construction phase of the Scheme, to ensure that access is maintained and disruption is minimised as far as possible. As outlined in Section 12.10, local people and businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through road diversions.	Slight Adverse (not significant)
	Lord Ted Pub and Carvery, Farndon Road	Medium - There are limited alternatives in the vicinity and this receptor is likely used frequently (weekly) as a place to socialise	The enlargement of Farndon Roundabout to facilitate an additional lane will temporarily impact 200 metres of Farndon Road for approximately 42 months. Farndon Road provides access to the Lord Ted Pub and Carvery.	Negligible - Access will be maintained and any delays experienced will be minimal and will not affect the viability of the receptor.		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
	Community assets on Mather Road: - Kings Waterside and Marina	Medium - The level of use is likely to be reasonably frequent (monthly) and there are some limited alternative facilities available locally	Mather Road will be used as a haul route for the construction activities at Nether Lock Viaduct. Consequently, users of community assets located via Mather Road, such as Kings Waterside & Marina, may experience some disruption and/or delays as a result of increased construction traffic.	Negligible - Access will be maintained and any delays experienced will be minimal and will not affect the viability of the receptor.		Neutral (not significant)
	Community assets in Winthorpe- -Winthorpe Primary School -Winthorpe Community Centre	High - The receptors are likely to be accessed every day	The realignment of Winthorpe Roundabout will temporarily affect 400 metres of the A1133, reducing access throughout the construction period.	Minor - While the A1133 is the primary route between Winthorpe and Newark-on-Trent and the A46, access via this route will be maintained throughout the construction period.		Slight Adverse (not significant)
	Community assets accessed via Drove Lane: -Newark Showground	Medium - The assets at the showground are likely to be accessed	The enlargement and partial signalisation of Winthorpe Roundabout is likely	Negligible - Access will be maintained and any delays experienced will be minimal and will		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
	-Newark Golf Centre -Newark Indoor Bowls	monthly by users	to have a temporary impact on access to community assets to the south of the roundabout, particularly all assets at Newark Showground which is accessed via Drove Lane. The works will temporarily impact 100 metres of Drove Lane.	not affect the viability of the receptor.		
Development land and businesses	Businesses accessed via Lincoln Road	Very high - Lincoln Road provides access to a large area of existing employment land to the south of the A46	Construction activities at Brownhills junction will temporarily affect 100 metres of Lincoln Road, temporarily reducing access to development land and businesses accessed via Lincoln Road – such as McDonalds, Premier Inn, KFC, Toolstation, and Brownhills Motorhomes.	Negligible - Access will be maintained and any delays experienced will be minimal and is unlikely to affect the use (footfall) of receptors.	As outlined in Section 12.10, a TMP would be implemented during the construction phase of the Scheme, to ensure that access is maintained and disruption is minimised as far as possible. As outlined in Section 12.10, local people and businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through road diversions.	Slight Adverse (not significant)
	GXO Currys National Distribution	Very high - The employment	Construction activities at Friendly Farmer Roundabout	Negligible - Access will be maintained and any delays		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
	Centre, Long Hollow Way	area is greater than 5 hectares	are likely to have a temporary impact on access to businesses in the surrounding area, such as those accessed from the A17 including GXO Currys National Distribution Centre. Approximately 200 metres of the A17 will be impacted, and this may lead to a temporary disruption and/or delays in access as a result of increased construction traffic and construction activity.	experienced will be minimal and is unlikely to affect the use (footfall) of receptors.		
	Shell Garage, A17 Winthorpe Roundabout	Medium - the Garage is an existing site of employment of less than one hectare	The realignment of the access route off the A46 to the Shell petrol station will temporarily affect access into the petrol station from the A46. A one-way system will be implemented, with access to the filling station provided via the A17. The	Minor - Severance has been introduced however adequate access has been provided throughout the construction period.		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
			existing A46 exit will be built in stages in order to maintain its use throughout the construction period, with an overnight closure for the final surface course.			
	Esso Garage, Lincoln Road, Winthorpe Roundabout	Medium- the Garage is an existing site of employment of less than one hectare	Construction activities at Friendly Farmer Roundabout at Brownhills junction may have some impact on access to Esso Garage, due to increased construction activity. However, main construction routes to the north east of the roundabout are located behind the Esso Garage which should limit impacts on access.	Negligible - Access will be maintained and any impact on customers as a result of increased traffic is likely to be minimal.		Neutral (not significant)
Agricultural land holdings	Farm 06	Medium - This land is key agricultural infrastructure (arable land) on which the farm enterprise is	An access route running parallel to the A46 provides access to areas of Farm 06 – to the east of Winthorpe Roundabout. Access to Farm 06	Negligible - Access will be maintained.		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		partially dependent.	land via Drove Lane (one of two access routes) will be temporarily severed as a result of construction activities at Winthorpe Roundabout for approximately 36 months. Access to all farmland will be retained via the alternative access route near Danethorpe Lane. As such, while access will be restricted, it will be maintained throughout the construction period.			
	Farm 11	High - The land is key agricultural infrastructure (arable land) on which the farm enterprise is dependent	The sole access route into Farm 11 will be temporarily severed for approximately 36 months due to the presence of the NLRL satellite construction compound.	Minor - Access to Farm 11, will be re-provided via Kelham Road, to the north of the farm for a period of 36 months.		Slight Adverse (not significant)
	A46 Underpass (walking/	Medium - This path is used	The enlargement of Farndon	No change - Access will be	As outlined in Section 12.10, a local people and	Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
Walkers, cyclists and horse-riders	cycleway off Crees Lane)	recreationally and other alternative routes are available. The survey identified 74 users over five days.	Roundabout to facilitate an additional lane will temporarily impact 300 metres of Fosse Road for approximately 42 months. This is unlikely to impact upon the Crees Lane footway, and access will be maintained.	maintained and users will experience minimal delays in their journey.	businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through WCH diversions.	
	Newark BW2	Medium - The location of the Bridle Way 2 suggests the route is primarily used for recreational purposes and therefore, any severance is not likely to affect users of community resources. The route is well used, with 312 users observed during the two day survey.	Construction of Windmill Viaduct will result in the temporary closure and diversion of Newark Bridle Way 2 for 24 months.	Major - The proposed diversions, via Crees Lane and the Newark FP3, would increase walking, cycling, and horse-riding distances by up to 700 metres.		Moderate Adverse (significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
	Newark FP14	Medium – FP14 provides access (via fields, steps and across the A46) between Newark and Kelham Road. 15 users were observed during a two day survey, suggesting that FP14 is used for recreational purposes.	Construction of the Scheme will result in the official permanent closure of FP14.	Minor – Users of the footpath will be permanently diverted via Cattle Market Roundabout. This will increase walking distances by approximately 210 metres.		Slight Adverse (not significant)
	Trent Valley Way (Kelham Road)	Very high - The route is a national route and is likely to be used for commuting and recreation daily – 34 users were observed during the two day survey.	The reconfiguration of Cattle Market Roundabout, slip roads, and the A46 to the west of Cattle Market Roundabout will temporarily affect 350 metres of Great North Road up to Kelham Road for approximately 42 months.	No change - Access will be maintained and users will experience minimal delays in their journey.		Neutral (not significant)
	Footpath/ Cycleway along Great North Road (Cattle Market Roundabout)	Very high - The route is likely to be used for commuting and recreation daily – 118 users	Construction of the new Cattle Market Grade Separated junction will result in the permanent realignment of the	Negligible - The diversions will follow a similar route and are unlikely to add a considerable (<50		Slight Adverse (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		were observed during the five day survey	footpath/cycleway along Great North Road. Temporary, signalised crossings will be in place, in the same vicinity, throughout the 30-month construction period. These crossings will segregate active travel users from the construction operations.	metre) increase to journey lengths.		
	Footpath at end of Newark BW5	Medium - The path at the end of Newark BW5 leads to a dead end at the Nottingham to Lincoln Railway Line and is not an official public right of way. However, the survey data does indicate that this path is used frequently by recreational users. The survey results observed 48 users over two	Construction activities at the Nether Lock Viaduct will temporarily restrict access to the path for the duration of the construction period. During this time, the path will be closed and inaccessible for all users, except those authorised to operate and maintain the hydroelectric power station at Nether Weir.	Negligible - While the path will be inaccessible throughout the construction period, there is an alternative walking route (namely BW5) in the vicinity offering walking routes for recreational users.		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		days, with 41 users on the weekend.				
	Newark BW6	Medium - The location of the BW6 suggests the route is primarily used for recreational purposes and walking long distances. 61 users were observed during the two day survey, 48 of which were observed on the weekend	Construction activities at the Nether Lock Viaduct will temporarily restrict access to Newark BW6 for a period of 10 weeks for the installation of a temporary bridge crossing at Nether Lock. During this time, BW6 will be marshal controlled. As such access will be retained, with users escorted along BW6 throughout the 10-week construction period.	No change - Access will be maintained and users will experience minimal delays in their journey.		Neutral (not significant)
	Newark FP48#1	Medium - The location of the footpath suggests the route is primarily used for recreational purposes. 50 users were observed over	Construction of the Crankley Point Sewage Treatment Works underpass extension and the earthworks operations associated with the embankment widening will result in the temporary	Major - The proposed diversions would increase walking distances by up to two kilometres for a period of 24 months.		Moderate Adverse (significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		the two day survey period.	closure and diversion of Newark FP48#1 for a period of 24 months.			
	National Cycle Network 64 and Trent Valley Way along Winthorpe Road	Very high - The paths are national routes and likely to be used daily for recreation and commuting. 421 users were observed over the 7-day survey period, of which 93 were observed over the weekend.	Construction of the Brownhills junction will lead to temporary changes in access to National Cycle Network 64 and the Trent Valley Way along Winthorpe Road. Access will be maintained throughout the construction phase, with diversions phased over 24-months.	Negligible - Access will be maintained throughout the construction period.		Slight Adverse (not significant)
	Footway off Lincoln Road	High - This route records frequent daily use, with 462 users over the two day survey period.	Construction activities at Brownhills junction will temporarily affect 100 metres of Lincoln Road, which may temporarily impact access to this footway. However, access will be maintained.	No change - Access will be maintained and users will experience minimal delays in their journey.		Neutral (not significant)
	Footway located south- west of Mint Leaf	Low - The usage of this route is low,	This footpath is located at Friendly Farmer roundabout,	No change - Access will be maintained and		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		with 11 users observed over the two day survey period. This footpath provides at-grade pedestrian access across the A46	and therefore users may experience higher flows of traffic during the construction period.	users will experience minimal delays in their journey.		
	Footbridge at Friendly Farmer roundabout	High - This footbridge provides a direct and convenient WCH route across the Friendly Farmer roundabout, linking Newark with the employment centre at GXO Currys. The survey identified 424 users over two days.	Access to the footbridge may be slightly impacted by the construction works on Friendly Farmer roundabout, however access will be maintained throughout.	No change - Access will be maintained and users will experience minimal delays in their journey.		Neutral (not significant)
	Winthorpe FP2	Low - The route is a dead end and does not offer a meaningful route for users.	Winthorpe FP2 spans from Winthorpe down to the A46, where it is severed from Winthorpe FP3 on	No change - As FP2 currently leads to a dead end, the reduction in length of approximately 100		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
			the eastern side of the A46. During construction, FP2 will be permanently stopped up approximately 100 metres before the A46.	metres provides no real change.		
	Winthorpe FP3	Low - At present there is no link between Winthorpe FP2 and 3 and therefore this does not present a meaningful crossing for users. Indeed, only 7 users were identified over two days of surveys.	FP3 currently joins the footway/cycleway along the southbound carriageway of the A46, and for a period of 18 months during construction will link with a temporary diversion of the A46/ Drove Lane and Friendly Farmer footpath.	Negligible - The diversions will follow a similar route and are unlikely to add a considerable (<50 metre) increase to journey lengths.		Neutral (not significant)
	Hargon Lane	Medium - The route provides a WCH path into Winthorpe and is well used for recreation purposes. The two day survey identified 66 users, of which	Access to Hargon Lane will not be impacted by the construction period of the Scheme.	No change - Access will be maintained.		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Additional mitigation/enhancement	Significance of residual effect
		52 were dog walkers.				
	Footway along the A46 between Drove Lane and Friendly Farmer Roundabout	Medium- The location of the footway suggests it is mainly used for leisure purposes	The footpath would be diverted to a parallel route the south of its existing alignment for 18 months prior to the start of the construction of the new Friendly Farmer Link, which will realign the route on a permanent basis	Minor- The diversion, and then realignment, will follow a similar route to the present footway and are unlikely to add a considerable (<250 metre) increase to journey lengths.		Slight adverse (not significant)

Temporary changes in amenity

- 12.11.4 Construction of the Scheme would result in a range of activities which will adversely alter the amenity of the local community. Influencing factors include an increase in HGV and other construction traffic on local roads, the diversion of local traffic, the establishment of construction sites, the installation and use of construction equipment, as well as the presence of construction workers in the LIA.
- 12.11.5 Receptors located in close proximity to temporary work areas are likely to experience changes in amenity during the construction period.
- 12.11.6 Amenity effects are identified where at least two significant residual (post-mitigation) effects stemming from changes in noise, air quality and/or landscape and visual amenity combine at the same location/receptor.
- 12.11.7 As no significant residual noise or air quality impacts were reported there is no effect on amenity during construction.

Construction impacts on human health

Temporary changes in access to local services

- 12.11.8 Routes required for the construction of the Scheme may lead to temporary changes in access to local services (such as health, social care and education facilities) due to changes in travel routes and/or journey delays.
- 12.11.9 Evidence indicates that access to healthcare services can have a considerable impact on health and wellbeing, with the use of and access to these services dependent on proximity, transport facilities and the supply of trained staff. Similarly, educational attainment is strongly linked with health outcomes.
- 12.11.10 Changes to road layouts, temporary diversions and road closures are likely, throughout the LIA, during the construction period. There is therefore the potential for delays in access for users of local services. Changes in access to local services during construction are detailed in Table 12-13.

Table 12-13: Changes in access to local services during construction

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Local services	Farndon Roundabout Fosse Road, including: -Red Rose Care Community -Country Kids Day Nursery - Lemon Tots -St Peters Cross Keys C of E Academy	Medium - There are higher levels of deprivation but some other alternatives to these resources exist in the wider area.	The enlargement of Farndon Roundabout to facilitate an additional lane will temporarily impact 300 metres of Fosse Road for approximately 42 months. This will impact access to local services which are accessed via Fosse Road and Crees Lane, including Red Rose Care Community, Country Kids Day Nursery, and St Peters Cross Keys C of E Academy.	Moderate - Construction will likely be a medium-term duration (42 months) and will affect a large minority of the population.	As outlined in Section 12.10, a TMP would be implemented during the construction phase of the Scheme, to ensure that access is maintained and disruption is minimised as far as possible. As outlined in Section 12.10, local people and businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through road diversions.	Slight adverse (not significant)
	Cattle Market Roundabout - Great North Road	Medium - The area has moderate levels of deprivation and a lack of alternate similar local resource.	The enlargement of Cattle Market Roundabout and the construction of two new slip roads will temporarily impact 0.35km of Great North Road to the south reducing access throughout the construction period for 42 months. The affected assets include Newark Job centre and Citizens Advice. This is due to increased construction activity, particularly increased HGV on construction routes.	Negligible - Only a small minority of the population are likely to be affected with slight service quality implications.		Neutral (not significant)
	Services at Great North Road including	Medium - The area has moderate levels of deprivation	The enlargement of Cattle Market Roundabout and the construction of two new slip roads will temporarily impact	Negligible - Very few people are likely to be affected with slight service quality		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
	Children 1 st Nursery	and a lack of alternate similar local resources.	0.25km of Great North Road to the north, reducing access throughout the construction period. The affected assets include Children 1 st Nursery.	implications.		
	Local services in Winthorpe, including: Winthorpe Primary School	Medium - The school is located in an area of lower deprivation and there are few alternative resources in the neighboring town.	The realignment of Winthorpe Roundabout will temporarily affect 400 metres of the A1133, reducing access throughout the construction period. The affected assets include Winthorpe Primary School.	Minor - While the A1133 is the primary route between Winthorpe and Newark-on-Trent and the A46, access via this route will be maintained throughout the construction period.		Slight Adverse (not significant)

Temporary changes in social capital

- 12.11.11 Construction of the Scheme may impact on social capital.³² Within the LIA, the introduction of a temporary construction workforce into established communities has the potential to adversely alter people's perceptions of, and interactions with their communities – modifying behaviour and the value they place on social capital. The connections between individuals within communities, and the increased likelihood that arises through these networks for individuals to feel valued, to feel a sense of belonging, to have companionship and to support each other, is important for health and wellbeing. Adverse effects on health from changes in social capital could be experienced as a reduction in wellbeing or as physiological effects on the body's hormonal and immune systems, with increased susceptibility to mental and physical illness.
- 12.11.12 Construction of the Scheme may impact upon employment and income across the WIA. There is a strong correlation between employment status and health and wellbeing outcomes. Being employed increases a household's income, which can improve physical and psychological wellbeing, providing people with the financial means to access the goods and services which they need. There is also evidence to suggest that employment status may also be a consequence of physical and mental health, rather than the direct cause. Temporary changes in social capital during construction are detailed in Table 12-14.

³² Social capital refers to the networks of relationships among people who live and work in a particular society, enabling that society to function effectively. Social capital requires trust and participation among individuals

Table 12-14: Changes in social capital during construction

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Social capital	Social cohesion	Medium - The sensitivity of the LIA is medium due to experiencing relatively higher levels of deprivation than other areas. The proportion of women is also in line with regional and national averages.	During the day, the workforce will be present on construction sites and compounds. Although the number of construction workers for each element of the construction is not yet confirmed, the presence of construction workers is likely to be noticeable for those living in the area, particularly for people living in the town of Newark, and the villages of Farndon and Winthorpe. Additionally, as construction workforces are, in general, predominantly male, perceptions of personal safety for women may decrease due to the presence of sizable construction workforce in the local vicinity of the new development.	Minor - Construction workers are likely to be spread out throughout the LIA. The severity predominantly relates to a moderate change in quality of life and the impact will be rapidly reversed.	N/A	Slight Adverse (not significant)
	Employment and income	Low - The sensitivity of the WIA is low due to having lower than national average levels of deprivation and unemployment.	During construction, there is likely to be a beneficial impact on the economy through both new and existing contracts entered into with local companies across the WIA. This is likely to be beneficial for employment opportunities associated with direct employment from the construction activity, as well as for local businesses through indirect spend, during the four-year construction period.	Moderate - A large minority of the population could be affected for a medium-term duration.	N/A	Slight Beneficial (not significant)

Temporary changes in access to green space, recreation and physical activity

12.11.13 Routes required for the construction of the Scheme may lead to temporary changes in access to green space, recreation and physical activity due to changes in travel routes and/or journey delays. Changes to road layouts, temporary diversions and road closures are likely, throughout the LIA, during the construction period. There is therefore the potential for delays in access for users of green space, recreation and physical activity. Temporary changes in access to green space, recreation and physical activity are detailed in Table 12-15.

Table 12-15: Changes in access to green space, recreation and physical activity

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Access to green space, recreation and physical activity	Receptors on Fosse Road: - Farndon Recreation Ground	Low - The population of the local area have levels of poor health and long-term health conditions in line with regional and national figures.	The enlargement of Farndon Roundabout to facilitate an additional lane will temporarily impact 300 metres of Fosse Road for approximately 42 months. This will impact access to green space, recreation and physical activity assets accessed via Fosse Lane, such as the Farndon Recreation Ground.	Negligible - Access will be maintained and there would be no quality implications to the use of recreational open spaces.	As outlined in Section 12.10, a TMP would be implemented during the construction phase of the Scheme, to ensure that access is maintained and disruption is minimised as far as possible.	Neutral (not significant)
	Receptors on Mather Road: -Kings Waterside and Marina - Mather Road Play Area	Low - The population of the local area have levels of poor health and long-term health conditions in line with regional and national figures.	Mather Road will be used as a haul route for the construction activities at Nether Lock Viaduct. Consequently, users of community assets located via Mather Road, such as Kings Waterside and Marina, may experience some disruption and/or delays as a result of increased construction traffic.	Negligible - Access will be maintained and there would be no quality implications to the use of receptors.	As outlined in Section 12.10, local people and businesses will be engaged with through the use of the Construction Communications Management Plan about how construction may impact them, for example through road diversions.	Neutral (not significant)
	Newark Ransome and Marles Cricket Club	Low - The population of the local area have levels of poor health and long-term health conditions in line with regional and national figures.	The enlargement of Cattle Market Roundabout and the construction of two new slip roads will temporarily impact 350 metres of Great North Road, and Kelham Road which leads off it, reducing access throughout the construction period. The affected assets include Newark Ransome and Marles Cricket Club.	Negligible - Access will be maintained and there would be no quality implications to the use of the receptor.		Neutral (not significant)
	Receptors on	Low - The	The enlargement and partial	Negligible - Access		Neutral (not

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
	Drove Lane: -Newark Showground -Newark Golf Centre -Newark Indoor Bowls and Boccia -Elk Motorsports	population of the local area have levels of poor health and long-term health conditions in line with regional and national figures.	signalisation of Winthorpe Roundabout is likely to have a temporary impact on access to the green space and recreational assets to the south of the roundabout, particularly all assets at Newark Showground which is accessed via Drove Lane. The works will temporarily impact 100 metres of Drove Lane.	will be maintained and there would be no quality implications to the use of receptors.		significant)
	Receptors on Winthorpe Road: -National Cycle Network Route 64 -Trent Valley Way	Low - The population of the local area have average health when compared with regional and national figures.	Construction of the Brownhills junction will lead to temporary changes in access to National Cycle Network Route 64 and the Trent Valley Way along Winthorpe Road. Access will be maintained throughout the construction phase, with diversions phased over the 24-month period.	Minor - It is intended that an alternative route is made available prior to significant access issues occurring, so any impact is likely to be short-term.		Neutral (not significant)
	Navigation along the River Trent	Low - The population of the local area have comparable to regional and national levels of good or poor health.	Construction activities at the Nether Lock Viaduct will restrict navigation along the River Trent during the night (for one week) for the installation of a temporary bridge crossing at Nether Lock. Additional night-time closures will also be required for the bridge beam installation at Netherlock Viaduct and Windmill Viaduct. Navigation activities will not be possible during this time.	Negligible - Access restrictions are limited to one week for the temporary bridge installation with additional night time closures for the bridge beam installation. The height of the temporary bridge will allow for full navigation use of the		Neutral (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
				river to resume following the overnight closures.		
	<p>Angling infrastructure along the River Trent:</p> <ul style="list-style-type: none"> -Fishing pegs on the west bank, between Fiddlers Elbow Bridge BR25 and Nether Rail BR 27 - fishing pegs on the east bank between Fiddlers Elbow Bridge BR25 and BR26 - fishing pegs on the east bank between BR26 and Nether Rail BR27 	<p>Low - The population of the local area have comparable to regional and national levels of good or poor health.</p>	<p>Construction activities at the Nether Lock Viaduct will temporarily restrict access to fishing pegs along the River Trent near Nether Lock. The installation of a temporary bridge crossing at Nether Lock will temporarily disrupt access on the eastern bank, between Fiddlers Elbow Bridge BR25 and Nether Rail BR27 for a period of ten weeks. During this time, BW6 (which provided access to the fishing pegs) will be marshal controlled, allowing controlled access to the fishing pegs. The use of the fishing pegs will need to be closed during night time bridge beam lift operations. Fishing pegs on the west bank of the River Trent, between Fiddlers Elbow Bridge and Nether Rail BR27 will be inaccessible for a 30 month period as a result of bridge deck construction works.</p>	<p>Minor - Access will be maintained to all fishing pegs on the eastern bank of the River Trent, with medium-term disruption to a limited number of fishing pegs between on the western bank near Nether Lock.</p>		Neutral (not significant)

Operational impacts on land use and accessibility

Permanent changes in access to community receptors

12.11.14 The operation of the Scheme has the potential to alter access to community receptors in the LIA. Improved junctions and new motorised and WCH routes have the potential to change the volume and flow of traffic along the A46 and merging roads. The Scheme has the potential to decrease congestion along the A46, between Winthorpe and Farndon, consequently improving journey times and reducing severance to local services for all users. Improvements to WCH routes may also improve access for walkers, cyclists and horse riders in the local area. Changes in access to community receptors during operation are detailed in Table 12-16.

Table 12-16: Changes in access to community receptors during operation

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Private property and housing	Private property and housing in LIA	High - The sensitivity of the receptor is high, due to the size of the LIA and large number of homes within the area. As these are residential properties they will be accessed daily.	There are likely to be beneficial impacts on access to private property and housing as a result of the Scheme. The aims of the Scheme are to provide improved journey times and reliability in the local area and it is likely that this would improve access to private property and housing in the LIA.	Negligible - There will be a very minor improvement in journey reliability.	N/A	Slight Beneficial (not significant)
	Langford Hall	High - the sensitivity of the receptor is high due to the daily use of the residential property.	Existing access to Langford Hall via the A46 will be closed and access provided via a new route via the A1133. This will reduce interactions between slower turning traffic and faster moving traffic along the A46.	Minor - there will be a minor positive amendment to access to this residential property as there is already existing access via the A1133.		Slight Beneficial (not significant)
Development land and business	Development land and businesses in LIA	High - The sensitivity of the receptor is high, as existing land within the LIA allocated for development land and existing business exceeds 5 hectares	There are likely to be beneficial impacts on access to development land and businesses as a result of the Scheme. The aims of the Scheme are to provide improved journey time and reliability in the local area and it is likely that this would improve access to development land and businesses in the LIA during the operation period.	Negligible - There will be a very minor improvement in journey reliability.		Slight Beneficial (not significant)
WCH	New shared access and WCH route across the	Low - FP2 is currently a dead end and does not offer a meaningful	A new WCH route will be created, linking the existing Winthorpe FP2 and FP3 footpaths. This will	Minor - The magnitude will be minor as the route		Slight Beneficial (not significant)

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
	A46 at present Winthorpe FP2 and FP3 locations	route for any users.	provide a new walking/cycling route between the community of Winthorpe with locations to the south of the A46, such as the Newark Showground.	results in the removal of severance.		
	National Cycle Network 64 and Trent Valley Way along Winthorpe Road	Very high - The paths are national routes and likely to be used daily for recreation and commuting.	The new Brownhills junction will result in the permanent realignment of National Cycle Route 64 and the Trent Valley Way along Winthorpe Road. While the realignment will increase walking distance along the WCH route by 105 metres, it will be on an upgraded and segregated WCH route. The new alignment will require users to cross the A46 slip road at grade. This crossing will be signalised to further slow the traffic coming off the 50 mile per hour A46. As vehicles will already be slowing down for the Brownhills junction roundabout, the inclusion of a signalised crossing point at the site will further improve safety for WCH users.	Minor - There will be an increase in journey length of 105 metres.		Moderate Adverse (significant)

Permanent changes in amenity

- 12.11.15 Changes in amenity result from a combination of significant residual (post-mitigation) effects reported in other topics, specifically noise, vibration, air quality and visual effects. For an amenity effect to be identified, at least two residual effects must combine at the same location.
- 12.11.16 Amenity effects are identified in this chapter where at least two significant residual (post-mitigation) effects stemming from changes in noise, air quality and/or landscape and visual amenity combine at the same location/receptor.
- 12.11.17 As no significant residual noise or air quality impacts were reported with mitigation in place there are no amenity impacts during operation.

Operation impacts on human health

Permanent changes in access to local services

- 12.11.18 The operation of the Scheme has the potential to improve access to local services in the LIA. Improved junctions and new motorised and WCH routes have the potential to change the volume and flow of traffic along the A46 and merging roads. The Scheme has the potential to decrease congestion along the A46, between Winthorpe and Farndon, consequently improving journey times and reducing severance to local services for all users. This may reduce feelings of isolation and encourage the use of WCH routes, resulting in positive impacts on physical and mental health. Changes in access to local services during operation are detailed in Table 12-17.

Table 12-17: Changes in access to local services during operation

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Access to services, health, and social care	Access to services, health, and social care	Low - Even though there are higher levels of deprivation, the health profile of the WIA is good when compared with regional and national figures.	There are likely to be beneficial impacts on access to services, health, and social care as a result of the Scheme. The Scheme will provide improved journey time and reliability in the local area, thus improving access to services, health, and social care in the LIA during the operation period.	Moderate - Improvements to access will likely impact a large minority of the population.	N/A	Slight Beneficial (not significant)

Permanent change in the provision of green space, recreation and physical activity

12.11.19 The operation of the Scheme has the potential to improve access to the provision of green space, recreation, and physical activity in the LIA. Improved junctions and new motorised and WCH routes have the potential to change the volume and flow of traffic along the A46 and merging roads. The Scheme has the potential to decrease congestion along the A46, between Winthorpe and Farndon, consequently improving journey times and reducing severance to the provision of green space, recreation, and physical activity for all users. This may reduce feelings of isolation and encourage the use of WCH routes, resulting in positive impacts on physical and mental health. Permanent changes in the provision of green space, recreation and physical activity during operation are detailed in Table 12-18.

Table 12-18: Permanent changes in the provision of green space, recreation and physical activity

Receptor	Sub-receptor	Sensitivity	Description of impact	Magnitude	Mitigation	Significance of residual effect
Access to green space, recreation and physical activity	New shared access and WCH route across A46 at present Winthorpe FP2 and FP3 locations	Low - The population of the local area have comparable to regional and national levels of good or poor health.	A new WCH route will be created, linking the existing Winthorpe FP2 and FP3 footpaths. This will provide a new walking/cycling route between the community of Winthorpe with locations to the south of the A46, such as the Newark Showground.	Negligible - The route is likely to be used on a one-off basis and by a very small proportion of the population.	N/A	Neutral (not significant)
	National Cycle Network 64 and Trent Valley Way along Winthorpe Road	Low - Even though there are higher levels of deprivation, the health profile of the local area is good when compared with regional and national figures.	The new Brownhills junction will result in the permanent realignment of National Cycle Route 64 and the Trent Valley Way along Winthorpe Road.	Minor - The route will affect a small proportion of the population.		Neutral (not significant)

12.12 Monitoring

- 12.12.1 Monitoring will be undertaken in accordance with the requirements of the First Iteration EMP [~~REP4-010~~REP6-012]. During the construction phase of works, and in accordance with Requirement 3 of the draft DCO [~~REP4-003~~REP6-004] a Second Iteration EMP will secure the monitoring requirements and procedures to reduce or eliminate impacts on the environment.
- 12.12.2 To maximise potential benefits from changes to temporary employment, the First Iteration EMP [~~REP4-010~~REP6-012] states that the Applicant will be responsible for:
- Monitoring the number of employees from the local (Newark and Sherwood District) area
 - Recording the monetary value of contracts which have been entered into with local (Newark and Sherwood District) companies
 - Monitoring what apprenticeship and training opportunities have been provided where people of Newark and Sherwood District have benefited
- 12.12.3 This monitoring is required for the duration of the construction period.
- 12.12.4 Regular engagement should be undertaken with the Newark Showground and other recreational activities to ensure that construction activity is planned around key events.

12.13 Conclusions

- 12.13.1 This assessment of the effects, and their significance, of the Scheme as it applies to population and human health has been carried out based on the information currently available.
- 12.13.2 The assessment considers the potential impact of the construction and operation of the Scheme on population, employment, residential properties, businesses, community facilities, open spaces and recreational areas and human health outcomes.
- 12.13.3 The assessment has drawn upon guidance and requirements presented within DMRB LA 112 Population and Human Health, IEMA-Health in Environmental Impact Assessment, and IEMA- Determining significance for human health in Environmental Impact Assessment, and professional judgement, as well as national and local policy.
- 12.13.4 The construction of the Scheme is likely to have an overall adverse impact on agricultural land and WCH provision as a result of both permanent and temporary land take and reduced access during construction. Compensation will be provided to land and business owners if considered due under the Compensation Code.

12.13.5 The operation of the Scheme is expected to have a beneficial impact on access to private property and housing; development land and businesses; community land and assets; green space, recreation and physical activity due to the reduced congestion and improved journey times that the Scheme will deliver.

12.13.6 In summary, the predicted significant effects during construction and operation are listed in Table 12-19.

Table 12-19: Summary of significant effects

Receptor	Sub- receptor	Description	Overall effect
Construction - Land use and accessibility			
Agricultural land holdings	Farm 01	Land take- Permanent land take affecting 36% of the farm land within the LIA	Permanent Large Adverse (significant)
	Farm 02	Land take- Permanent land take affecting 12% of the farm land within the LIA	Permanent Moderate Adverse (significant)
	Farm 07	Land take- Permanent land take requiring 15% of the farm land within the LIA	Permanent Moderate Adverse (significant)
	Farm 09	Land take- Permanent land take requiring 61% of the farm land within the LIA	Permanent Large Adverse (significant)
	Farm 10	Land take- Permanent land take requiring 31% of the farm land within the LIA	Permanent Large Adverse (significant)
	Farm 14	Land take- Temporary land take requiring 13% of the farm land within the LIA	Temporary Moderate Adverse (significant)
		Land take- Permanent land take requiring 15% of the farm land within the LIA	Permanent Moderate Adverse (significant)
	Farm 15	Land take- Temporary land take requiring 24% of the farm land within the LIA	Temporary Large Adverse (significant)
	Farm 16	Land take- Permanent land take requiring 17% of the farm land within the LIA	Permanent Moderate Adverse (significant)
Walkers, cyclists, and horse riders (WCH)	Newark BW2	Access- Temporary closure of up to 24 months with planned diversions of 700 metres	Temporary Moderate Adverse (significant)
	Newark FP48#1	Access- Temporary closure of up to 24 months with planned diversions of 2 kilometres	Temporary Moderate Adverse (significant)
Construction - Human health			
No significant human health effects have been identified			

Receptor	Sub- receptor	Description	Overall effect
Operation - Land use and accessibility			
Walkers, cyclists, and horse riders (WCH)	National Cycle Network 64 and Trent Valley Way along Winthorpe Road	Access- New Brownhills junction will lead to 105 metre diversion	Permanent Moderate Adverse (significant)
Operation - Human health			
No significant human health effects have been identified			

12.14 References

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