A46 Newark Bypass

TR010065/APP/7.1

7.1 Case for the Scheme - Track Changed

APFP Regulation 5(2)(q)

Planning Act 2008

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

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

A46 Newark Bypass

Development Consent Order 202[x]

Case for the Scheme - Track Changed

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Rev 1	March 2024	DCO Application
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Contents

1 Introduction

1.1 Purpose of the Document

1.1.1 This Case for the Scheme (this "Case for the Scheme") relates to an application for a Development Consent Order (DCO) made by National Highways (the "Applicant") to the Secretary of State for Transport via the Planning Inspectorate (the "Inspectorate") under section 37 of the Planning Act 2008 (the "2008 Act"). If made, the DCO would grant consent for the A46 Newark Bypass (the "Scheme").

1.1.2 This Case for the Scheme has been prepared in accordance with Regulation 5(2)(q) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 and the Inspectorate's Advice Note Six (Preparation and Submission of Application Documents) (version 11).

1.1.3 This Case for the Scheme aims to provide details of the need and case for the Scheme. It provides key information in support of the Scheme and demonstrates the robustness of the application made, following careful consideration of alternatives. This Case for the Scheme also provides a description of the Scheme and surrounding environment. While the submission of Case for the Scheme is not a mandatory requirement under the 2008 Act, it has been prepared to accompany the application for the DCO to summarise how the Scheme relates to and complies with Government policy and the relevant planning policy context, including national and local planning policy.

1.1.4 It also provides an overview of the traffic assessment and related economic analysis upon which the need and case for the Scheme is based.

1.1.5 The application will be determined in accordance with Section 104 of the 2008 Act, which applies in relation to the decision in cases where a National Policy Statement (NPS) has effect. Section 104(2)(a) of the 2008 Act states that, in deciding an application, the Secretary of State must have regard to *"a relevant national policy statement".* Section 104(3) of the 2008 Act states that the Secretary of State must decide an application in accordance with any relevant NPS. As the NPS is (subject to section 104(4) and (8) of the 2008 Act) the primary policy reference for the Secretary of State in their decision making, it sets the scope of matters for this Case for the Scheme to consider.

1.1.6 For this Scheme, the relevant NPS is the National Policy Statement for National Networks (NPSNN) (Department for Transport (DfT), 2014)[1]. The NPSNN Accordance Tables ~~(TR010065/APP/7.2)~~[AS-090] set out

[1] Department for Transport. (2014) National Policy Statement for National Networks. [Online]. Available at: https://www.gov.uk/Government/uploads/system/uploads/attachment_data/file/387223/NNNPS-web.pdf. (Accessed May 2023).

the important and relevant considerations to the determination of the application in accordance with section 104(2) of the 2008 Act.

1.1.7 This Case for the Scheme will also assess the Scheme against key policy and relevant considerations, drawing on key assessments and environmental information set out in the Environmental Statement (ES) (~~TR010065/APP/6.1~~contained within Volume 6.1) submitted with the application.

1.2 The Applicant

1.2.1 The Applicant is appointed and licensed as the strategic highways company for England by the Secretary of State for Transport, on whose behalf it is responsible for planning, designing, building operating and maintaining the Strategic Road Network (SRN).

1.2.2 The Applicant seeks to provide a modern and reliable road network with fewer delays. In achieving this, it's aims are for a network that:

- Provides fast and reliable journeys (supporting economic growth).
- Improves safety for all.
- Delivers better environmental outcomes.
- Meets the needs of all users.

1.2.3 Achieving the above aims can also support economic growth through creating jobs, helping businesses, and opening new areas for development. The underlying focus is to deliver long-term benefits for the community and road users and be environmentally sustainable.

1.3 Requirement for Development Consent Order

1.3.1 The Scheme is classified as a Nationally Significant Infrastructure Project (NSIP) as defined under sections 14(1)(h) and 22(1)(b) of the 2008 Act as:

- The highway to be altered is wholly within England.
- National Highways Limited is the Strategic Highway Authority for the highway.
- The speed limit will be greater than 50mph and the area of development at 211 hectares exceeds the 12.5 hectares threshold.

1.3.2 Pursuant to the 2008 Act, the Applicant is required to secure a DCO in order to construct, maintain and operate the Scheme.

1.3.3 Section 104 of the 2008 Act requires applications to be decided in accordance with the relevant NPS, in this case the NPSNN (DfT, 2014). The NPSNN sets out principles by which applications for road and rail schemes should be assessed. Paragraph 4.3 of the NPSNN states:

"In considering any proposed development, and in particular, when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State should take into account:

- *Its potential benefits, including the facilitation of economic development, including job creation, housing, and environmental improvement, and any long-term or wider benefits.*
- *Its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts."*

1.4 Requirement for an Environmental Impact Assessment

1.4.1 The Scheme falls within paragraph 10(f) of Schedule 2 to the Infrastructure Planning (Environmental Impact Assessment) (EIA) Regulations 2017 as the potential for significant environmental effects has been identified, and an ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) has been prepared to accompany the DCO application to the Inspectorate. A Regulation 8(1)(b) notice was submitted to the Inspectorate in September 2022 alongside submission of an Environmental Scoping Report.

1.4.2 The Environmental Scoping Report was produced in August 2022, to establish the scope of the EIA. It was prepared in accordance with Regulation 10 of the Infrastructure Planning (EIA) Regulations 2017, LA103 (Scoping projects for environmental assessment) of the Design Manual for Roads and Bridges (DMRB), and the Inspectorate's Advice Note Seven (version 7 republished June 2020), for all environmental factors (topics) set out in the Infrastructure Planning (EIA) Regulations 2017.

1.4.3 The Environmental Scoping Report was submitted to the relevant consultation bodies by the Inspectorate. A response was received from the Inspectorate on 10 October 2022, with a 'Scoping Opinion' (dated 21 October 2022) ~~(**TR010065/APP/6.1**)~~ which provides the Secretary of State's written opinion as to topics to be assessed in the ES [APP-189] ~~(**TR010065/APP/6.1**)~~.

1.4.4 The ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) submitted with the application meets the requirements of Regulation 14 of the Infrastructure Planning (EIA) Regulations 2017 and provides details of the assessments that have been undertaken for the Scheme. The ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) sets out a description of the likely significant effects of the Scheme on the environment in relation to key topics and identifies the measures that are proposed to avoid, prevent or reduce and, if possible, offset likely significant adverse effects. The assessments in the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) have been undertaken in line with the National Highways' DMRB.

1.4.5 The EIA Regulations and the NPSNN also require that DCO applications set out the alternative options considered as part of the Scheme development. Further details of these options can be found in Chapter 3 of this Case for the Scheme and are also set out in the Chapter 3 (Assessment of Alternatives) of the ES [APP-047] ~~(TR010065/APP/6.1)~~.

1.5 Other Consents and Licences

1.5.1 The principal consent for the Scheme will be a DCO. The DCO process provides development consent for the works and enables land acquisition and temporary possession of land, along with other consents and powers to be dealt with at the same time.

1.5.2 The DCO application may be required to be supplemented by other consents, licenses, and agreements.

1.5.3 The Consents and Agreements Position Statement ~~(TR010065/APP/3.3)~~[REP4-007] sets out what permits, licenses and agreements that are expected to be needed for the Scheme, along with the Applicant's intended strategy for obtaining those consents and associated agreements.

1.6 Planning Policy Context

1.6.1 A hierarchy of policy exists in support of a development consent. It is a means through which an application for development consent, designated as a NSIP, within the provisions of NPS can seek approval by the Secretary of State. Section 104 of the 2008 Act states that the Secretary of State must decide an application *"in accordance with"* any relevant, designated NPS and must have regard to any matters they consider as important and relevant. The documents in this hierarchy can be summarised as follows:

- The NPSNN, published in December 2014 and designated in January 2015, is the relevant NPS which sets out the Government's vision and policy for development of the strategic road and rail networks.
- A draft NPSNN was published by the Government for consultation in March 2023 and concluded in June 2023. Whilst this draft NPSNN has not yet been designated it can still be an important and relevant consideration by the Secretary of State when determining the DCO decision for the Scheme. An assessment of the Scheme's compliance with the draft NPSNN is provided in the Draft NPSNN Accordance Tables ~~(TR010065/APP/7.~~[~~3~~REP2-023]~~)~~

- The National Planning Policy Framework (NPPF) ((The Department for Levelling Up, Housing and Communities, December 2023)[2] 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.
- At the local level, every Local Planning Authority (LPA) should have an adopted development plan for the area, which sets out the planning policies and proposals for land use in their area. It is these policies that planning applications for development in the area are determined in accordance with, provided they are not of a scale to qualify as an NSIP. The adopted development plan should align with the NPPF. In addition to the adopted development plan, emerging draft policy may be a material consideration in decision-making. The relevant LPA for the Scheme is Newark and Sherwood District Council. The Scheme is situated within the county boundary of Nottinghamshire County Council and within the administrative boundary of Newark and Sherwood District Council.
- In addition, an LPA may adopt Supplementary Planning Documents (SPDs) which do not form part of the development plan for the area, but which provide additional guidance or detail on policies within the development plan and are a material consideration for an LPA in their decision-making.

1.6.2 In terms of the relationships between documents in the policy hierarchy for the Scheme, the following principles apply:

- A designated NPS provides the principal planning policy to be applied in determining a DCO application. A designated NPS does not form part of the development plan for an area but has primacy over it, reflecting the national interest.
- Under Section 104 of the 2008 Act, the Secretary of State must have regard to any other matters which they think are both important and relevant to their decision, in addition to certain other specified matters.
- The NPPF requires local authorities to take account of the development principles set out in relevant NPSs when preparing their local plans.
- In general terms, there should be no conflict between policies in a designated NPS and the NPPF; however, if this does arise the designated NPS has primacy.

1.6.3 The 'development plan' for an area includes documents defined by Section 38 of the Planning and Compulsory Purchase Act 2004 (the "2004 Act"); these are development plan documents prepared under the provisions of that 2004 Act and adopted by the relevant local authority.

[2] Ministry of Housing, Communities, and Local Government. (2023). National Planning Policy Framework. [Online]. Available at: National Planning Policy Framework (publishing.service.gov.uk). (Accessed December 2023).

1.6.4 SPDs are capable of being important and relevant but are not part of the development plan for an area.

1.7 Structure of the Document

1.7.1 This Case for the Scheme comprises the following Chapters:

- **Chapter 1** - provides an introduction, confirming the details of the Applicant and explains why the Scheme is an NSIP, therefore requiring the submission of a DCO application.
- **Chapter 2** – explains how the Scheme has been developed over time. It details the options considered and explains how these were refined in order to arrive at the Scheme detailed within the DCO application.
- **Chapter 3** – provides a description of the Scheme and considers the need for the Scheme, examining existing issues and considering how these could develop in the future if the Scheme were not implemented. This chapter also sets out the key aims and objectives of the Scheme.
- **Chapter 4** – presents the high-level transport case for the Scheme.
- **Chapter 5** – presents the monetised and non-monetised Scheme benefits and confirms the economic case for the Scheme.
- **Chapter 6** – identifies the main national and local planning policies relevant to the Scheme and provides an analysis of the Scheme's compliance with planning policy.
- **Chapter 7** – presents the overall planning balance of the Scheme.
- **Chapter 8** – presents the overall conclusion and explains why the Scheme should be granted development consent.

2 Scheme Development and Options Considered

2.1 Overview

2.1.1 This chapter will outline the Scheme evolution, as well as the alternative 'options' which were considered in determining the preferred route. The associated benefits and disbenefits of the various route options will be discussed to demonstrate the reason(s) for the preferred route selection.

2.1.2 A detailed description and analysis of the options is also set out in Chapter 3 (Assessment of Alternatives) of the ES ~~**(TR010065/APP/6.1)**~~[APP-047].

2.2 Options identification, assessment and short listing for consultation

2.2.1 The initial corridor sifting exercise identified a total of three potential corridor options: Corridors A, B and C. These corridors were considered and assessed against the Scheme objectives, NPSNN and DfT's Early Assessment and Sifting Tool + (EAST+).

2.2.2 The corridor and route option rationalisation process culminated in two milestones: Design Fix A and Design Fix B:

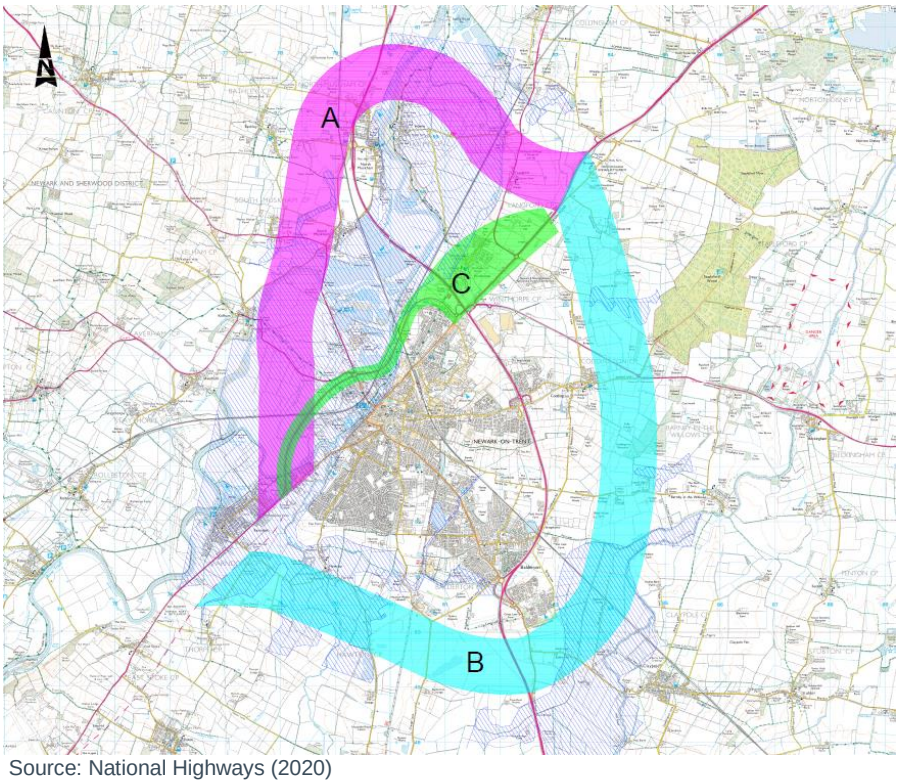
- Design Fix A – represented completion of corridor identification and initial sifting of corridors. This fix marked the end of a high-level sifting exercise to filter out any corridor(s) not suitable for further development.
- Design Fix B – represented completion of further design development, assessment and sifting of individual route and junction options within the corridors that had passed the Design Fix A gateway. This design fix was focused on development options within the remaining corridor(s), with a view to collecting sufficient evidence to differentiate between the costs, benefits and impacts of the options under consideration.

2.2.3 The development of corridors and the subsequent process to assess and sift them, in preparation for the development of route options, is described below.

2.2.4 At the Options Identification stage for the Scheme, a further two corridor options were identified, termed Corridor D and E, in addition to Corridors A, B and C. Therefore, five potential corridor options were identified to ensure a wide range of possibilities were considered.

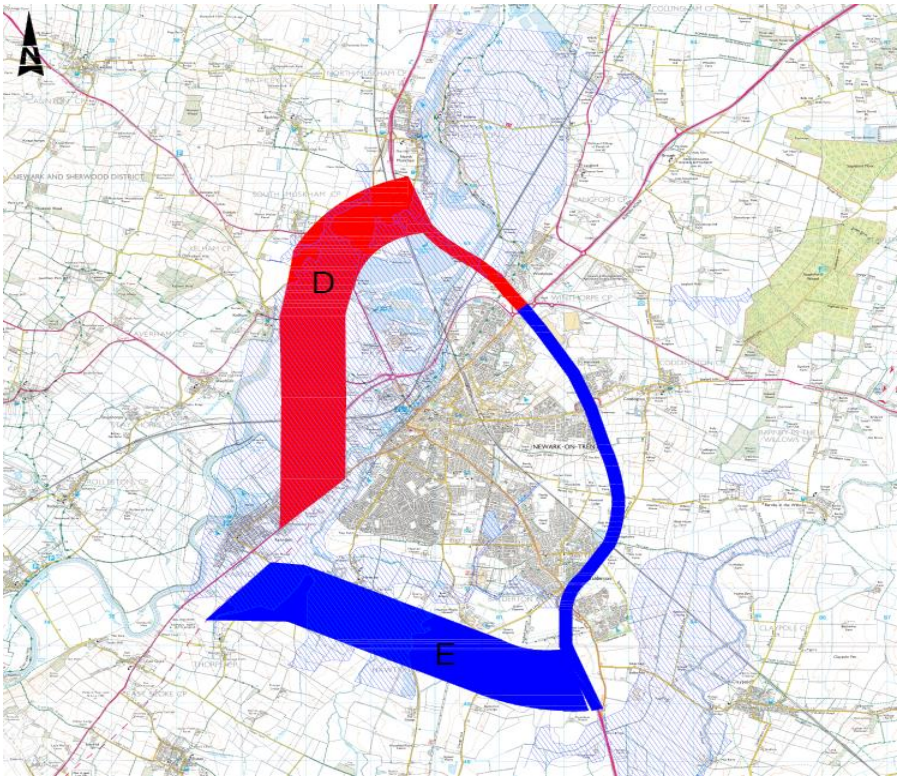
2.2.5 Figure 2-1 below shows the geographical locations of Corridors A, B and C. Figure 2-2 shows the further two corridors, Corridors D and E. Detailed descriptions of Corridors A-E are provided in Table 2-1.

Figure 2-1: Corridors A, B and C



Source: National Highways (2020)

Figure 2-2: Corridors D and E



Source: National Highways (2020)

Table 2-1: Corridor descriptions

Corridor	Description
A	Starts south-west of Newark-on-Trent, diverging towards the west of Newark-on-Trent, cuts across the railway line, crosses the River Trent, bypasses South and North Muskham, crossing the A1, crosses the River Trent again, cuts the railway line and re-joins the existing A46 near Brough.
B	Starts south-west of Newark-on-Trent, diverging near Thorpe on existing A46 avoiding the built-up area towards the east of Newark-on-Trent, crosses the A1, cuts across the railway line, crosses the A17 road and re-joins the existing A46 near Brough.
C	Follows the existing A46 corridor which starts from Farndon junction through to Winthorpe junction. The carriageway would be widened to dual carriageway between Farndon and the A1/A46 junctions. Capacity improvements are proposed for the Cattle Market, the A1/A46 and Winthorpe junctions.
D	Starts south-west of Newark-on-Trent, diverging from the existing A46, avoiding the built-up area towards the west of Newark-on-Trent, cuts across the railway line and the River Trent, bypasses south Muskham, connects and follows the A1 and re-joining the existing A46 at Winthorpe junction.
E	Starts south-west of Newark-on-Trent, diverging near Thorpe on existing A46 avoiding the built-up area towards east of Newark-on-Trent and connects the A1 near Fernwood, further follows the existing A1 and re-joining the existing A46 near Winthorpe junction.

2.2.6 An options workshop was held in January 2018 which included a review of the constraints and opportunities related to traffic, environment and highways for each corridor.

2.2.7 Each corridor was assessed against the Scheme objectives and the NPSNN. Furthermore, the Department for Transport's (DfT) EAST+ was used as an assessment tool in the assessment process.

2.2.8 To summarise, Corridor C was the best scoring with the application of the Scheme objectives, NPSNN and EAST+ assessment methodology. It was recommended that Corridors A, B, D and E would not be considered further. This is because A and D scored poorly against the Scheme objectives for environment and EAST+ appraisal

outcomes. Corridors B and E were eliminated because of their non-compliance with environmental policy. Further details are contained within Chapter 3 (Assessment of Alternatives) of the ES ~~(**TR010065/APP/6.1)**~~[APP-047] and within the Options Summary Report[3].

2.2.9 Completion of corridor identification and initial sifting of corridors represented completion of the Design Fix A stage.

2.3 Option Identification – Route and Options Sifting stage

2.3.1 This stage of the process included the development of route and junction options within Corridor C, including the assessment and sifting process applied to the route and junction options and recommendations for options that should be taken forward for further assessment.

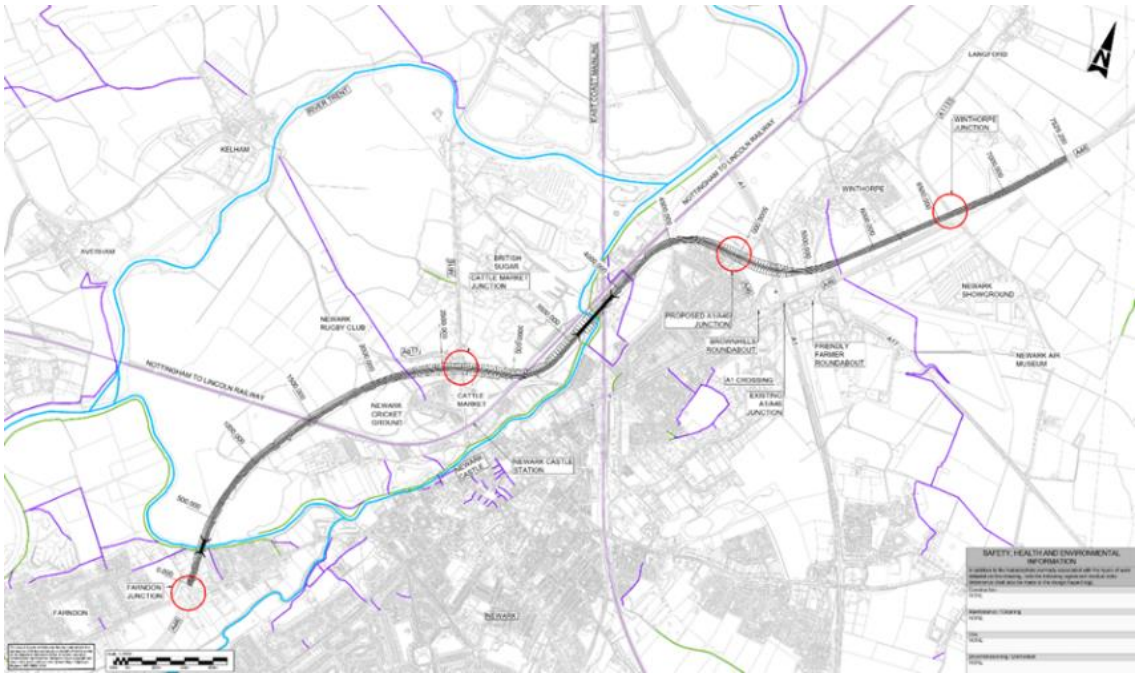
2.3.2 Following corridor identification and sifting, two route options were developed within Corridor C that broadly followed the existing A46 between Farndon roundabout and the A1/A46 junction. The routes bypassed the existing A1/A46 junction, leaving the A46 north of the River Trent viaduct, crossing the A1 and re-joining the A46 to the north of Winthorpe.

2.3.3 The routes differed in layout along the bypassing section:

- Route Option 1 (the Southern route): bypassed south of Winthorpe. There were two variations:
    - Route Option 1A – the route followed the existing A46 mainline from Farndon roundabout to the north of the existing Trent River Viaduct. The route then diverged away from the existing mainline, bypassing the existing A1/A46 junction, and crossed over the A1 via a new structure. The route then ran parallel to the existing A46's northbound carriageway and south of Winthorpe, before re-joining the existing A46 approximately 700 metres north of the existing Winthorpe roundabout (see Figure 2-3 below).

[3] National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: PW Integrated Template (citizenspace.com) (last accessed November 2023).

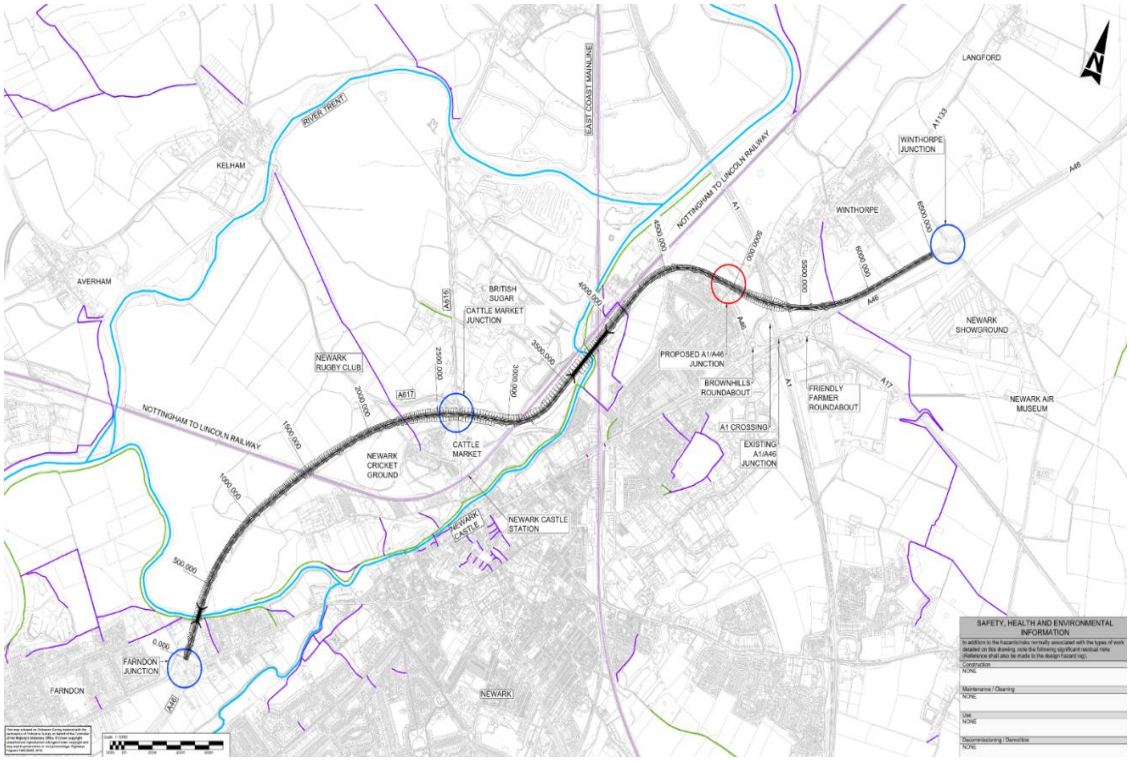
Figure 2-3: Route Option 1A Layout Plan



Source: National Highways (2021)

- Route Option 1B – the route followed the existing A46 mainline from Farndon roundabout to the north of the existing Trent River viaduct. The route then diverged away from the existing mainline, bypassing the existing A1/A46 Junction, and crossed over the A1 via a new structure. The route then followed the existing A46 mainline closely, south of Winthorpe, and re-joined the existing A46 at the existing Winthorpe roundabout (see Figure 2-4 below). Route Option 1B was approximately 1 kilometre shorter in construction length than Route Option 1A.

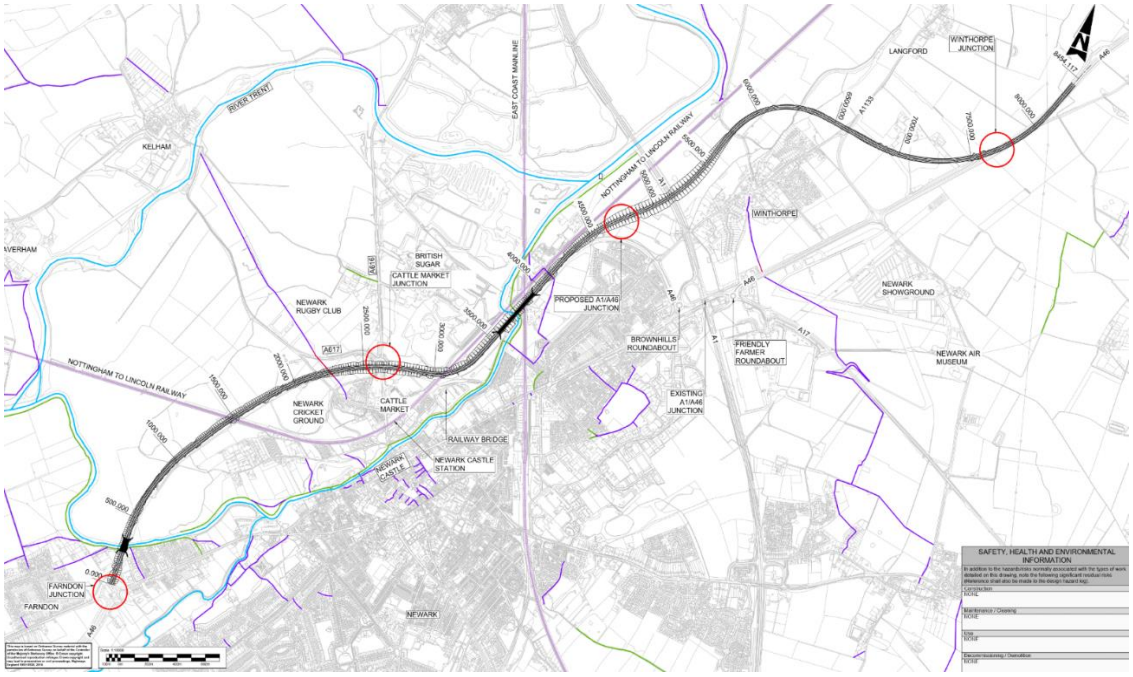
Figure 2-4: Route Option 1B Layout Plan



Source: National Highways (2021)

- Route Option 2 (the Northern route): the route followed the existing A46 mainline from Farndon Roundabout to the north of the existing Trent River viaduct. Route Option 2 left the existing A46 mainline and bypassed to the north of Winthorpe, crossing the A1 via a new structure. The route then re-joined the existing A46 mainline at a new junction located approximately 1600 metres north of Winthorpe roundabout (see Figure 2.5 below). Route Option 2 was approximately 1 km longer in construction length than Route Option 1A.

Figure 2-5: Route Option 2 Layout Plan



Source: National Highways (2021)

2.3.4 The route options underwent a sifting process which concluded that Route Option 2 would incur a significantly higher construction cost compared to Route Options 1A and 1B. This is because Option 2 has a greater construction length and associated land take requirements but would provide no further benefit in terms of improving journey times.

2.3.5 Regarding environmental considerations, while the impacts of all route options are similar, Route Option 1 variants were preferred over Route Option 2. The Route 1 variants were preferred in relation to the water environment and, geology and soils along the whole route, and cultural heritage, noise, and landscape and visual receptors along the stretch of the route near Winthorpe. Additionally, the Route 1 variants would have a lesser adverse economic impact on businesses and development.

2.3.6 To conclude, it was recommended that Route Options 1A and 1B were taken forward for further assessment.

2.4 Option Identification – Junction Sifting

2.4.1 Additional sifting of junction options was carried out following an appraisal of operation performance which was led by preliminary traffic modelling. Route Options 1A, 1B and 2 all include each of the four

junctions which were sifted: Farndon junction, Cattle Market junction, A1/A46 junction and Winthorpe junction.

2.4.2 The improvements to the junctions would seek to, amongst other things increase capacity and reduce congestion in order to meet the criteria set out in the Scheme objectives. Traffic modelling and economic assessments were used to determine which junction options would be the most beneficial, allowing the less beneficial options to be sifted out.

2.4.3 Completion of route and junction option sifting represented reaching the Design Fix B milestone.

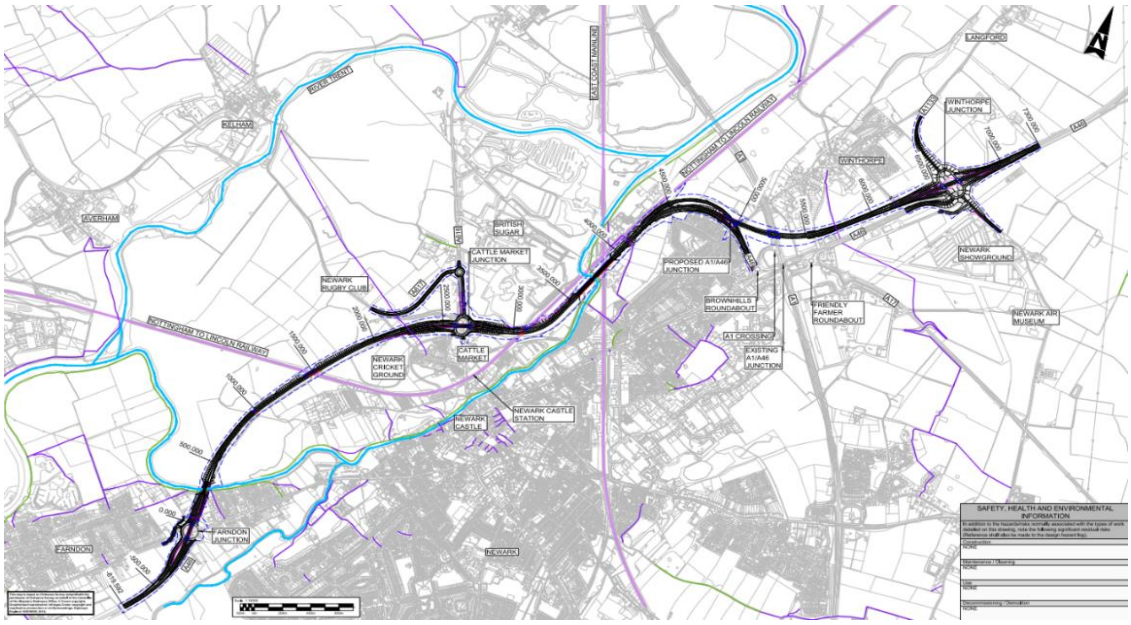
2.5 Option Identification – Scheme Option Appraisal

2.5.1 The remaining route and junction options which were identified in the sifting process above were combined into Scheme options for further assessment. This process is described below.

2.5.2 Following previous assessment, three Scheme options were identified for further assessment:

- Option A – The new A46 would follow the existing A46 mainline from Farndon roundabout to the north of the existing Trent River viaduct. From here, the route would diverge away from the existing mainline, bypassing the existing A1/A46 Junction, and cross over the A1 via a new structure. It would then run parallel to the northbound carriageway of the existing A46, to the south of Winthorpe, before tying in to the existing A46 approximately 700 metres north of the existing Winthorpe junction. The four main junctions along the route would all be grade separated (as shown in Figure 2.6 below).

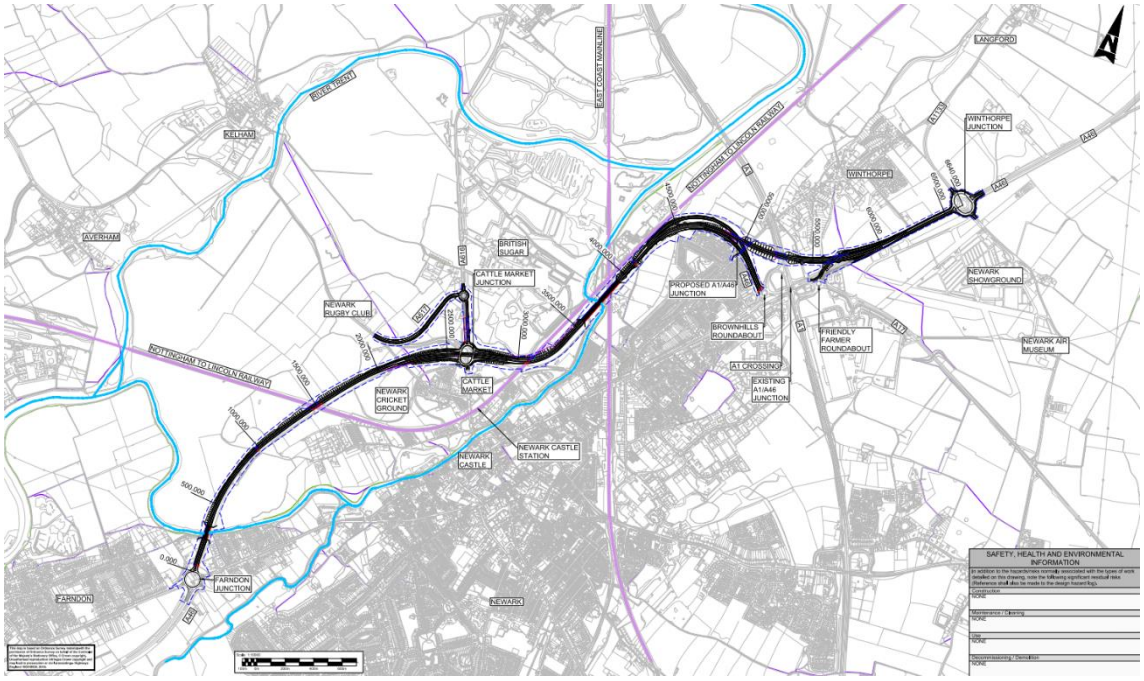
Figure 2-6: Option A



Source: National Highways (2021)

- Option B – The new A46 would follow the existing A46 mainline from Farndon roundabout to the north of the existing Trent River viaduct. The route would then diverge away from the existing mainline, bypassing the existing A1/A46 junction, and cross over the A1 via a new structure. The route would follow the existing A46 mainline closely, south of Winthorpe, and tie in to the existing A46 at the existing Winthorpe junction. The main junctions along the route will be at existing ground level junctions, except for the A1/A46 Junction, which would be grade separated (as shown in Figure 2.7 below).

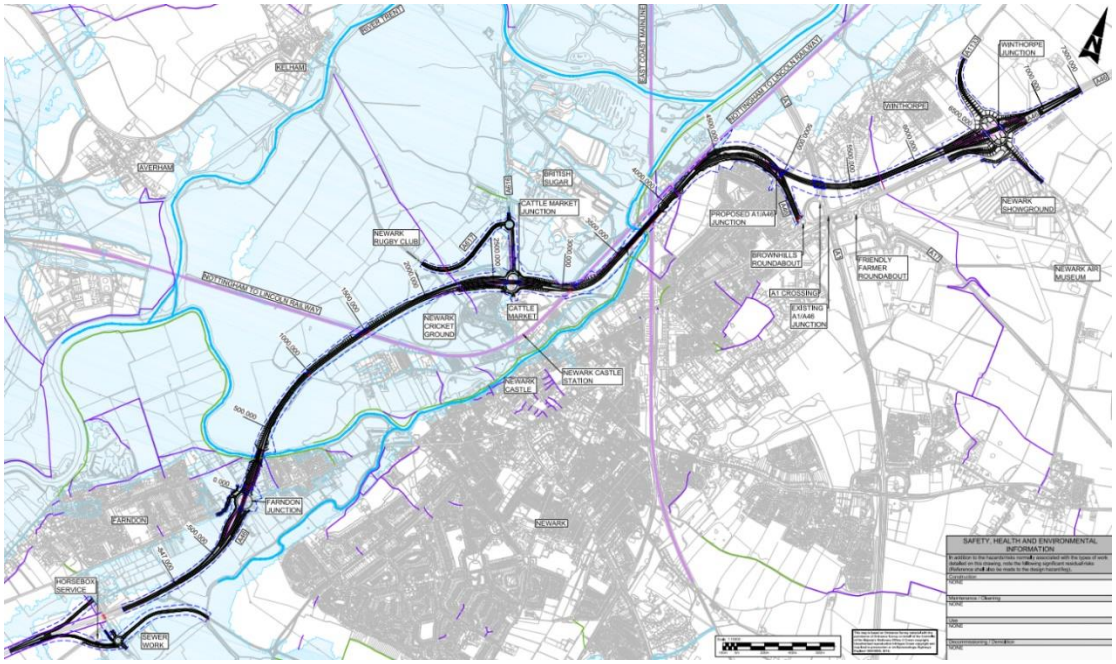
Figure 2-7: Option B



Source: National Highways (2021)

- Option C – Route Option 1A with all grade separated junctions as per Option A, but with an additional grade separated junction at Hawton Lane. It should be noted that Option C was developed as a sensitivity test to understand the impact of the southern link road junction on the Scheme. The southern link road is being delivered by Newark and Sherwood District Council to connect the A1 to the A46 to ease congestion on existing routes through Newark, with an expected completion by Spring 2025. This option would upgrade the southern link road roundabout, tying the A46 Scheme in with the southern link road, and provide grade separated links (see Figure 2-8 below).

Figure 2-8: Option C



Source**: National Highways (2021)**

2.5.3 Consideration was given to removing the new roundabout and instead realigning the southern link road to tie into the improved Farndon junction, thus removing congestion that would occur further south on the A46. However, adding a new link to the junction from the east would have been impractical due to the limited space, nearby private properties, the River Devon and other environmental constraints.

2.5.4 An alternative layout was developed to remove the at-grade roundabout, diverting the southern link road south to a new half junction at Hawton Lane with south-west-facing slips. At this point the Scheme was paused by the Applicant due to the Scheme not yet being announced as part of the Roads Investment Strategy 2 (RIS2).

2.5.5 Once the Scheme was remobilised in February 2020 following the RIS2 announcement, the assessment and consequent options identified were challenged to ensure a best value solution. Consequently, a new Scheme option (Option D) was identified which was based on Option B and incorporated new junction options at Cattle Market and Winthorpe.

2.5.6 Option D consisted of the following:

- The A46 would follow the existing A46 mainline from Farndon roundabout to the north of the existing Trent River viaduct. The route would then diverge away from the existing mainline, bypassing the existing A1/A46 junction, and cross over the A1 via a new structure. It would then run parallel to the northbound carriageway of the existing A46, to the south of Winthorpe, and tie into the existing Winthorpe junction. The junctions at

Farndon and Winthorpe would remain at grade, and the junctions at Cattle Market and the A1 would be grade separated.

All four options were evaluated against the engineering, traffic and economic, environmental, social and safety, operation, technology and maintenance assessments.

2.5.7 All options (Options A to D) resulted in the potential for likely significant adverse effects on noise receptors, heritage assets, landscape and visual, biodiversity, material assets and waste. However, of the four options, Option D had the marginally highest value for money when comparing benefits to costs.

2.5.8 Overall, Option B and Option D would have resulted in fewer likely significant adverse effects with mitigation, in comparison with Option A and Option C. Option B and Option D would have resulted in less habitat fragmentation, would have affected fewer heritage assets and had a smaller impact on affected listed structures along the A616; and would have had the least likely significant adverse effects predicted for noise. Option B and Option D would have also resulted in fewer likely significant adverse effects on landscape, townscape and visual receptors, water, mineral resources, waste generation and materials asset use. This was due to the extent of land take, new sections of road and elevated junctions, area of permeability and associated area of flood compensation in comparison to Option A and Option C. In addition, Option B would have had the lowest number of properties potentially affected in terms of air quality.

2.5.9 Option A would have provided greater benefits in terms of accidents, physical activity, severance and journey quality in comparison with the other options; however, Option A would have still resulted in adverse impacts on both security[4] and personal affordability[5].

2.5.10 All options were predicted to have a positive impact upon road safety and contribute to the National Highways target of reducing the number of people killed or seriously injured on the trunk road network.

2.5.11 Whilst all four options would have provided benefit to this section of the A46, the forecast outturn estimates for Option A and Option C were substantially more expensive than Options B and D due to the additional construction but do not provide enough additional benefits to justify the increased cost.

[4] "Security" considers the vulnerability of transport users to crime which is measured by site perimeters, entrances and exits, formal surveillance, landscaping, lighting and visibility and access to making an emergency call, as per the WebTag guidance (Department for Transport (2022) TAG Unit A4.1 Social Impact Appraisal [online] available at: TAG Unit A4.1 - Social-impact-appraisal 2022_Accessible_v1.0 (publishing.service.gov.uk) (last accessed July 2023)).

[5] "Personal affordability" considers the monetary costs of travel which can create a major barrier to mobility for certain groups of people, with particularly acute effects on their ability to access key destinations, as per the WebTAG guidance (Department for Transport (2022) TAG Unit A4.1 Social Impact Appraisal [online] available at: TAG Unit A4.1 - Social-impact-appraisal 2022_Accessible_v1.0 (publishing.service.gov.uk) (last accessed July 2023)).

2.5.12 Option A and Option C would also have greater environmental impacts.

2.5.13 Following the Option Identification – Scheme Option Appraisal process, it was recommended that Options B and D were to be taken forward to Options Selection for the reasons identified above and Options A and C were not to be taken forward. The options taken forward were renamed for options consultation – Option 1 was the route previously referred to as Option B, and Option 2 was the route previously referred to as Option D. Further details are set out in Chapter 3 (Assessment of Alternatives) of the ES ~~(**TR010065/APP/6.1**)~~[APP-047].

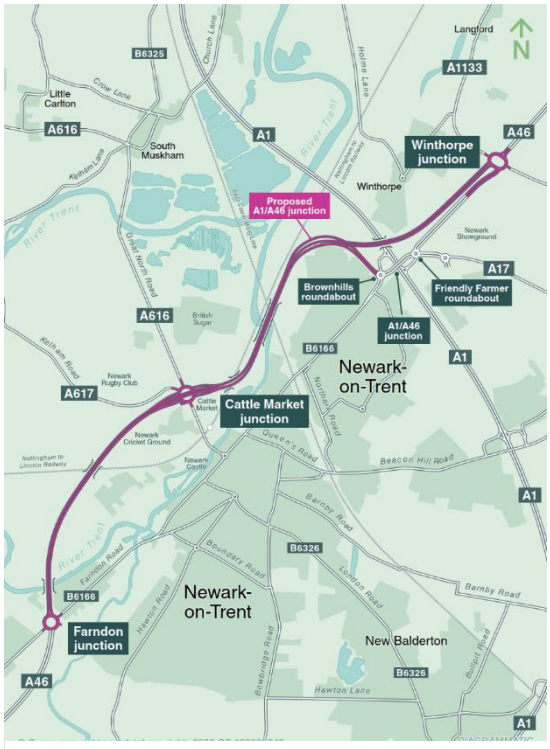
2.6 Option Selection – options public consultation

2.6.1 Two options were taken forwards into the Options Selection stage (Figures 2.9 and 2.10 below). An options consultation that took place (December 2020 to February 2021) on the two options formed a crucial part of the stakeholder engagement and development of the Scheme. It was the first formal opportunity for all stakeholders and the general public to contribute their views to provide the Applicant with an understanding of the local area and any potential impacts the Scheme may have on users and the community. The views and feedback gained from the options consultation helped to inform Scheme development and fed into the decision on a preferred option.

Figure 2-9: Option 1

Source: National Highways (2020)

Figure 2-10: Option 2



Source: National Highways (2020)

2.6.2 A total of 852 respondents, out of 1,584 responses, gave feedback in relation to the Scheme during the options consultation; further details are contained within the Report on Public Consultation within Annex A of the Consultation Report Annexes ~~(**TR010065/APP/5.2**)~~[APP-029]. The most cited concerns across both options were as follows:

- Need to grade separate all junctions.
- Need to resolve issues caused by roundabouts.
- Prefer a hybrid of the two options presented.
- Consideration of Newark-on-Trent Flat Crossing (rail).
- Scheme options not addressing safety concerns at the A1/A46 junction.
- Noise pollution as a result of the Scheme and associated noise mitigation.
- Negative impact on local residents, including visual and setting impacts of residential properties, risk of flooding and water drainage capacity and associated mitigation.
- Environmental/ecological impact and the associated mitigation required.
- Air pollution and carbon emissions.
- Safety and access for cyclists and pedestrians.
- Negative impact of, and disruption during, construction.

2.6.3 At this option selection stage, a proportionate environmental assessment of the likely significant effects of the two options took place. This assessment took into consideration available traffic data and design information including embedded mitigation measures, and potential mitigation and enhancement measures that could form part of the Scheme, and the existing environmental conditions of the local area. The conclusions from the environmental assessment for both options fed into the Options consultation material.

2.6.4 An Options Selection stage environmental assessment was undertaken in line with requirements of the Infrastructure Planning EIA Regulations 2017, and relevant environmental standards within the Design Manual for Roads and Bridges (DMRB), in particular, DMRB LA 104 Environmental assessment and monitoring[6] and DMRB LA 103 Scoping projects for environmental assessment[7].

2.6.5 Option 2 was selected on the basis of a number of factors, including safety, improved journey time reliability, and the level of overall support from the local community. Creating a flyover for the A46 to pass over Cattle Market junction and adding traffic lights at Farndon roundabout meant that Option 2 would provide additional capacity and the greatest travel time savings on the road. Furthermore, Option 2 would have the most potential going forward to incorporate further embedded design and essential measures to help mitigate any

[6] Design Manual for Roads and Bridges (2020) LA 104 – Environmental assessment and monitoring [online] available at: 0f6e0b6a-d08e-4673-8691-cab564d4a60a (standardsforhighways.co.uk) (last accessed March 2023).

[7] Design Manual for Roads and Bridges (2020) LA 103 – Scoping projects for environmental assessment [online] available: fb43a062-65ad-48d3-8c06-374cfd3b8c23 (standardsforhighways.co.uk) (last accessed March 2023).

potential significant effects, especially around Winthorpe and Cattle Market junction.

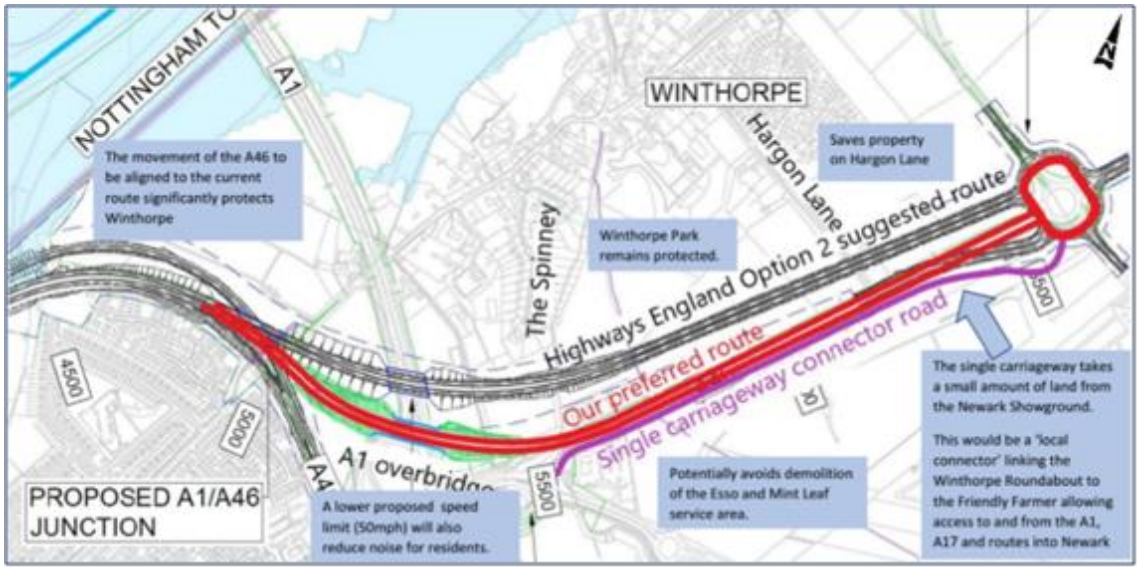
2.6.6 Following the Options Consultation, the 'Think Again' Action Group proposed an alternative solution (named Option 3) for the section of the A46 between the A1 and Winthorpe junction (Figure 2.11 below). Drawings produced by the Think Again Action Group were submitted to the Applicant in April 2021. The Applicant reviewed their proposals which also included a dedicated meeting to discuss Option 3 on 7 July 2021. The key features of the proposal which contrasted from Options 1 and 2 included:

- The road was routed further from Winthorpe on a tighter curve across the A1.
- The new road was routed back on to the existing A46 in the vicinity of the service stations.
- Traffic to and from Lincoln bound for the A1/A17 connected via a two lane link road situated on the south-eastern verge of the existing A46 and in part of the Newark Showground land.
- Both service stations were retained and still serviced the main through route.
- The 510 metre radius curve around the Winthorpe Road Estate and south Winthorpe would likely have required a 50 mph speed limit.

2.6.7 A qualitative assessment was carried out to evaluate this option. It was identified that the 70 mph design speed and 510 metre radius would be significantly below standard and would have required a very wide central reserve to provide sightlines around the bends. Whilst the Applicant could not progress with their suggested option, certain aspects suggested were implemented into the design including:

- A single carriageway link road connecting Friendly Farmer and Winthorpe roundabouts.
- A 70 mph design speed at the bridge across the A1 and the very wide median strip allowance for sightlines at the Cattle Market and Robert Dukeson Avenue.
- The utilisation of the south west bound existing A46 carriageway for the new Link Road and the construction of the new north east bound carriageway on the Winthorpe side of the existing A46.

Figure 2-11: Think Again preferred option



Source: Think Again Group (2021)

2.6.8 Option 2 Modified was developed in response to these concerns, with the route of the new A46 link crossing the A1 moved approximately 75 metres further south from Winthorpe than Option 2, more in line with the Think Again proposal.

2.7 Preliminary design – preferred option.

2.7.1 The Applicant made the preferred route announcement (PRA) (Option 2 Modified) in February 2022 (Figure 2.12 below). It is this route which forms the basis for the Scheme assessed within the Environmental Statement (~~**TR010065/APP/6.1**~~contained within Volume 6.1). Since that time the development of the Scheme design has been undertaken in accordance with the criteria for 'good design', outlined in the NPSNN. Further details can be found in the Scheme Design Report ~~(**TR010065/APP/7.6**)~~[APP-194]**.**

2.7.2 As set out at paragraph 1.4.2 an Environmental Scoping Report[8] was prepared and submitted to the Planning Inspectorate in September 2022. A Preliminary Environmental Information Report[9], was then prepared which supported the statutory consultation that took place between October and December 2022 see Annex J of the Consultation Report ~~(**TR010065/APP/5.1**)~~[APP-039 and APP-040].

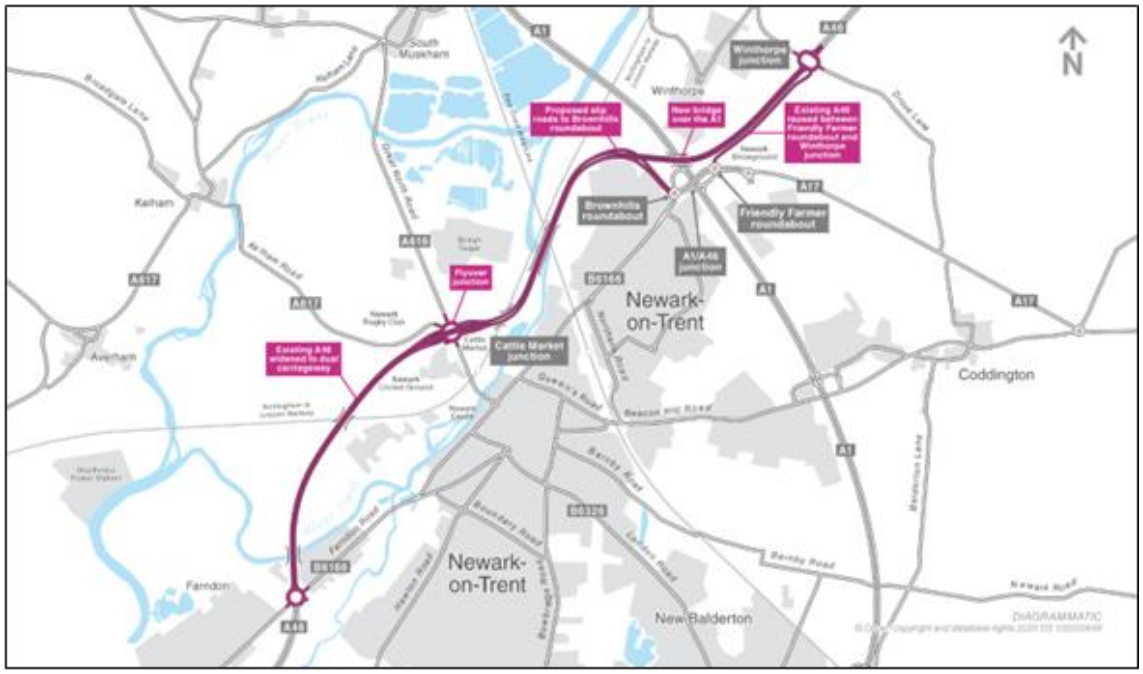
2.7.3 Amendments to the design, reflective of the design evolution in response to consultation, engagement and outcomes of the

[8] National Highways (2022) A46 Newark Bypass Environmental Scoping Report [online] available at: TR010065-000002-A46N - Scoping Report.pdf (planninginspectorate.gov.uk) (last accessed May 2023).

environmental impact assessment, are reported in Table 3-11 and Table 3-12 Chapter 3 (Assessment of Alternatives) of the ES ~~(TR010065/APP/6.1)~~[APP-047]. Further details regarding changes made to the design as a result of feedback received at statutory consultation are also available in the Consultation Report ~~(TR010065/APP/5.1)~~[APP-028].

2.7.4 The preferred option has subsequently been subject to environmental assessment for all those topics scoped into the assessment, with the full assessment being reported within the ES (~~TR010065/APP/6.1~~contained within Volume 6.1), as well as consultation with environmental bodies to further inform the assessments. Full details of these assessments are presented within Chapters 5 to 15 of the ES (~~TR010065/APP/6.1~~contained within Volume 6.1).

Figure 2-12: Option 2 Modified



Source: National Highways (2022)

2.8 Design development following the preferred route announcement

2.8.1 Design developments that have taken place since PRA and up to the time of statutory consultation are set out in Chapter 3 (Assessment of Alternatives) of the ES ~~(TR010065/APP/6.1~~[APP-047].

2.8.2 These design developments were assessed against compliance with design standards, including National Highways' ten principles of good

design[10] and further consultation with key stakeholders, including the Think Again Group at Winthorpe. The design amendments have been reviewed by the multi-disciplinary project team who considered wider impacts of the options on the Scheme benefits, road safety, traffic, stakeholders and the environment.

2.8.3 During this further assessment of the design post-PRA, aspects of Think Again Action Group's Option 3 proposal were reassessed. In collaboration with the Think Again Group and other stakeholders during summer 2022, further amendments were made incorporating more of the principles of the Option 3 proposal, to deliver a more robust design for the statutory consultation (October – December 2022), including:

- Retention of the interchange service station on the northbound A46
- Movement of the new link road further east to move more of the development onto the Newark Showground and reduce environmental impacts on the Winthorpe Conservation Area
- Movement of the A1 crossing further south away from the village

2.8.4 The design developments that have taken place between the PRA and statutory consultation, for each design change, are discussed in Table 3-10 of the ES ~~(**TR010065/APP/6.1**contained within Volume 6.1)~~[APP-047]. Further details on the design changes made as a result of feedback received from the statutory consultation are also available in the Consultation Report ~~(**TR010065/APP/5.1**)~~[APP-028].

2.8.5 The environmental effects of each design development helped inform the decision on those to be taken forward from Option 2 Modified Design to the developed design of the Scheme following the PRA to statutory consultation. Regarding the evolution since the Option 2 Modified design, the Scheme presented fewer adverse effects to heritage, archaeology, biodiversity, noise, air quality, flood risk and drainage. This has been achieved by reducing the Order Limits and slight movement of the Scheme away from nearby receptors, therefore affecting smaller areas of existing landscape and moving vehicle emissions further away from receptors in the vicinity of the Scheme.

2.9 Design development following statutory consultation and targeted consultation

2.9.1 Table 3-11 of Chapter 3 (Assessment of Alternatives) of the ES ~~(TR010065/APP/6.1)~~[APP-047] summarises the design developments that have taken place following the statutory consultation and the targeted consultation to produce the design which forms the application for development consent. The table summarises the design

[10] National Highways (2022) People Places and Processes: A guide to good design at National Highways [online] available at: People, places and processes (nationalhighways.co.uk) (last accessed October 2022).

presented at statutory consultation, the revised design following statutory consultation and the overall benefits or disbenefits of the amendments. These design developments have been integrated into the current Scheme presented and therefore the design that has been assessed within the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1).

2.10 Development of temporary construction works

2.10.1 Table 3-12 of Chapter 3 (Assessment of Alternatives) of the ES [APP-047](~~**TR010065/APP/6.1**~~) summarises the development of temporary construction works. These design developments have been integrated into the current Scheme presented and therefore the design that has been assessed within the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1).

3 The Need for the Scheme

3.1 Overview

3.1.1 This Section sets out the Scheme location, existing land use, historic character and aims and objectives of the Scheme, as well as the sub-regional economic, development planning and transport context that provides the strategic case for the Scheme.

3.2 Scheme Context

3.2.1 The A46 forms part of the strategic Trans-Midlands Trade Corridor between the M5 in the southwest and the Humber Ports in the northeast. The improvements to the A46 corridor are detailed within the DfT's RIS2 as a mechanism for underpinning the wider economic transformation of the country. RIS2 makes a commitment to create a continuous dual carriageway from Lincoln to Warwick.

3.2.2 The stretch of A46 between the Farndon Junction, to the west of Newark-on-Trent and the A1 to the east of Newark-on-Trent, is the last remaining stretch of single carriageway between the M1 and A1 and consequently queuing traffic is a regular occurrence, often impacting journey time reliability. The R1S2 in relation to the A46 Newark Bypass states:

"A46 Newark Bypass –improve the capacity of the single carriageway and junctions of the A46 at Newark and provide better links to the A1.

Midlands Connect has highlighted the role of the A46 in connecting the Midlands, running from Lincoln to Gloucestershire via Leicester and Coventry. Much of this road is already high-quality dual carriageway, and by filling in key sections it would be possible to create a coast-to coast highway without the need for major new roadbuilding across open countryside.

The single greatest gap in this route is the A46 at Newark. An upgraded dual carriageway opened in 2012, but which stopped three miles short of the A1. We now propose to fill in this gap, eliminating regular traffic jams and creating a consistently good connection from the A1 at Newark to the M1 at Leicester. Coupled with the upgrades committed in RIS1, this means that the A46 dual carriageway will run unimpeded from Lincoln to Warwick".

3.3 Need for the Scheme

3.3.1 The Scheme covers part of the A46 corridor, which plays a critical role within the SRN, connecting major manufacturing clusters and key ports. Stretching for 155 miles across the Midlands, the A46 corridor is home to 5.5 million people and 2.9 million jobs, with an economic output of £115 million; 9% of the English economy as evidenced by Midlands Connect, the local Sub-National Transport Body. The importance of the A46 is reflected in the strategic freight flows that use the route and underpinning key industries and economic sectors in the wider Newark area.

3.3.2 The operational performance of the A46 single carriageway around Newark is at odds with other sections, where the road is a dual carriageway. This manifests itself in a bottleneck with higher levels of congestion and lower average speeds (typically between 22 and 45 mph in contrast to 60 mph elsewhere). The key issues are:

- Poor time reliability – with variances expected to increase in the future.
- High level of low-speed shunts – which impact on turning lanes at junctions.
- High traffic flows, which exceed the design capacity.
- Congestion on the key A1/A46 Winthorpe junction which results in mainline queuing on the A1.
- The lack of a grade separated junction at Cattle Market junction in Newark, which is being compounded by queuing on the main B-road because of frequent rail level crossing downtimes.
- It forms part of a major freight route, and an alternative to the M1 corridor particularly to / from the Humber ports.

3.3.3 The existing network performance issues are further set out in Chapter 4 of this Case for the Scheme.

3.3.4 As such, the Scheme will address the above identified issues by:

- Improving the performance of the A46 around Newark and addressing the delays and congestion. Following the completion of the Newark to Widmerpool and Newark to Lincoln schemes, the underperformance of the A46 around Newark is now even more pronounced. This includes poor journey times and reliability; lower and unpredictable speeds; lack of resilience, especially during incidents; and other adverse impacts, such as queuing on the A1 off-slip. Further details are set out in Chapter 4 of this Case for the Scheme.
- Improving journey time reliability. Poor journey time reliability is a key characteristic, with the section ranked as the third least reliable in the North and East Midlands. This is essentially a consequence of this being the last remaining section of single carriageway of A46 and the presence of at-grade junctions. Further details are set out in Chapter 4 and 5 of this Case for the Scheme.

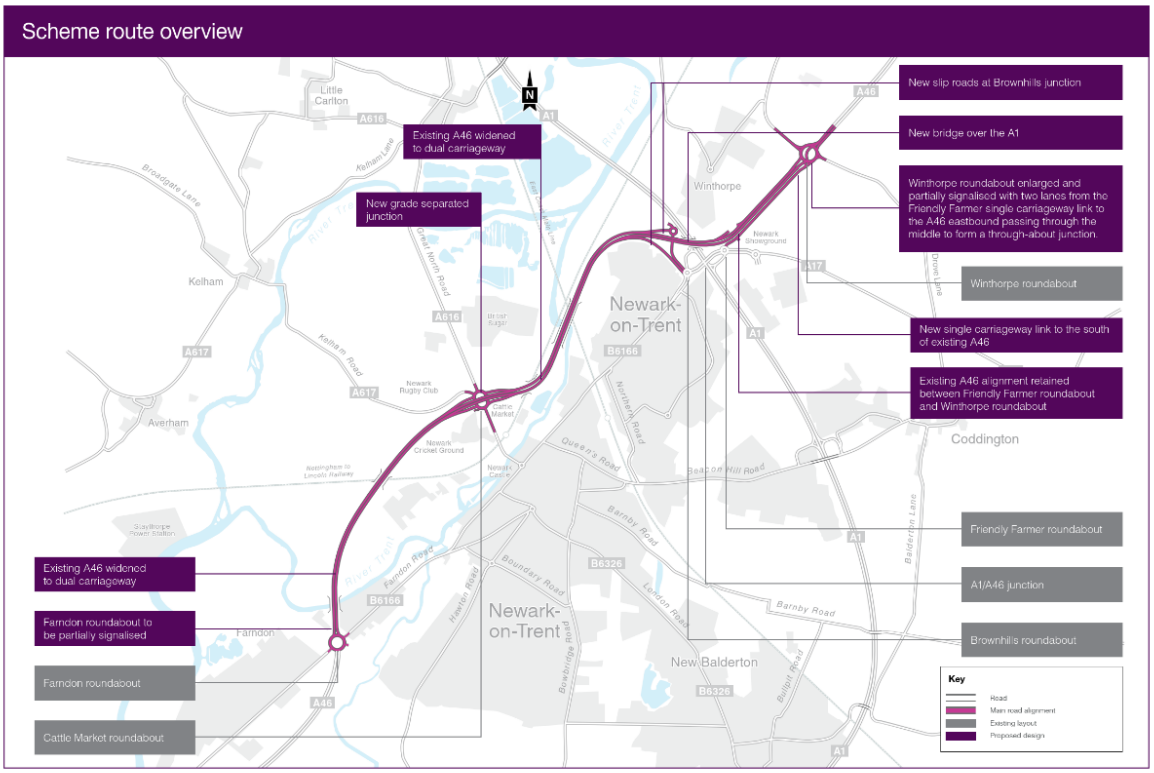
- Improving safety through compliance with layout and design standards. There are concerns about current compliance with design standards and observed collision and injury rates. There are a high number of low-speed shunts and accidents which impact on the resilience of the route. Further details are set out in Chapters 4 and 5 of this Case for the Scheme.
- Supporting and helping to unlock local economic aspirations. Newark is categorised as a Levelling Up Category 1 area by the Government, meaning Newark is deemed to be one of the places most in need of investment through the Levelling Up Fund, with major development proposed which will create new employment and housing, with resulting social benefits. Developments within and around Newark will be aided by the progression of the Scheme. Further details are set out in Section 3.12 of this Case for the Scheme.
- Boosting strategic connectivity. The Scheme will reinforce wider strategic connectivity. In particular, providing access to and from the Humber Ports to the Midlands, providing an alternative to the M1, as well as better supporting certain economic sectors, such as distribution and food which have stronger need for route reliability. Further details are set out in Section 3.11 of this Case for the Scheme.
- Achieving better environmental outcomes. The Scheme will help improve the local environment in and around Newark. Further details are set out in Chapter 6 of this Case for the Scheme.
- Supporting local transport networks. The Scheme will support the operation of existing local transport networks and will boost walking, cycling and horse-riding (WCH) links, with new enhanced routes. Further details are set in Chapter 4 of this Case for the Scheme.

3.4 Scheme Location

3.4.1 The Scheme would provide a dual carriageway on the A46 between Farndon and Winthorpe. The Farndon roundabout is located at the western extent of the Scheme where the B6166 Farndon Road joins the A46. The Winthorpe junction is located at the eastern extent where the A1133 joins the A46. Along its route, it crosses A617 and B6326, at the Cattle Market junction, and the A1 between the Friendly Farmer and Brownhills roundabouts. Figure 3.1 below shows the location of the Scheme and the location of the principal elements.

3.4.2 Further details on the location of the Scheme can be found on the Location Plan ~~(**TR010065/APP/2.1**)~~[AS-024] which shows the Scheme in its wider geographical context.

Figure 3-1 Scheme Location



3.4.3 The Scheme is situated within the county boundary of Nottinghamshire County Council and within the administrative boundary of Newark and Sherwood District Council.

3.4.4 The Scheme crosses the River Trent twice, the Nottingham to Lincoln railway line twice, and the East Coast Main Line once.

3.5 Existing land uses and character

3.5.1 The existing A46 between Farndon and Winthorpe is currently a single carriageway in both directions and, is generally elevated on embankment due to the low-lying floodplain of the River Trent. This floodplain is located to the west of the A46 for much of the affected length, along with a section at the southern end on the eastern side of the A46. Several roundabouts form key junctions along the route, linking with several local A roads. Road infrastructure is softened by roadside vegetation in places and the River Trent is a strong natural influence within an otherwise manmade landscape. To the north of the A46, farmland dominates, interspersed with small-scale settlements.

To the south of the road, the town of Newark-on-Trent forms a notable urban settlement.

3.6 Historic environment

3.6.1 The route of the Scheme crosses through a landscape dense in cultural heritage assets. Within the Scheme study area, the National Heritage List for England (NHLE), alongside the Nottinghamshire Historic Environment Record (HER), records 432 designated cultural heritage assets. These assets include:

- 17 scheduled monuments,
- 409 listed buildings,
- five conservation areas, and
- one registered park and garden.

3.6.2 No world heritage sites, protected wrecks, or registered historic battlefields are recorded within the study area. Chapter 6 (Cultural Heritage) of the ES ~~(**TR010065/APP/6.1**contained within Volume 6.1)~~[APP-050] considers any likely significant effects of the Scheme upon cultural heritage assets. The assessment considers both construction and operational phase effects.

3.6.3 The NHLE, maintained by Historic England, records 17 scheduled monuments of high heritage value within the Scheme study area. These cultural heritage assets range in date from the Roman through to post-medieval periods and predominantly relate to the English Civil War activity. These monuments comprise:

- The ruined and buried remains of the 12th century Newark Castle (MM001).
- Crococalana Roman town (MM002).
- Remains of Newark Town wall on Lombard Street (MM003).
- Hawton moated site, fishpond, Civil War redoubt and ridge and furrow (MM004).
- Standing cross known as Beaumond Cross (MM005).
- Civil War town defences within the Friary Garden (MM006).
- Civil War redoubt 550m southeast of Valley Farm (MM007).
- Gun platform 440m southeast of Muskham Bridge (MM008).
- Civil War redoubt 680m northwest of Dairy Farm (MM009).
- Civil War fieldwork on Crankley Point (MM010).
- Civil War redoubt on Crankley Point (MM011).
- Moated site 750m northwest of Dairy Farm (MM012).
- Queen's Sconce (MM013).
- Civil War redoubt 580m ENE of sugar refinery (MM014).
- Civil War sconce 650m northwest of Devon Bridge (MM015).
- Averham moat and enclosure (MM016).

- Langford medieval village, including moat and open field system, 450m northwest of Elmtree Farm (MM017).

3.6.4 The NHLE records 409 listed buildings of high heritage value within the Scheme study area. These buildings date to the medieval, post-medieval and modern periods and comprise:

- Seven grade I listed buildings.
- 15 grade II* listed buildings.
- 387 grade II listed buildings.

3.6.5 The NHLE records one registered park and garden within the Scheme study area, the 19th century designed parkland at Newark Castle Gardens (MM427).

3.6.6 The Nottinghamshire HER alongside the results of research and archaeological survey undertaken as part of the Preliminary Design for the Scheme, records 424 non-designated cultural heritage assets. These assets include:

- 267 archaeological remains.
- 138 historic buildings. and
- five historic landscapes.

3.7 Landscape Character

3.7.1 At a national level the Scheme and study area are located within National Character Area (NCA) 48 Trent and Belvoir Vales.

3.7.2 At a county level, the study area includes parts of four regional character areas (RCA) defined by the Newark & Sherwood Landscape Character Assessment SPD.

- Trent Washlands RCA which covers the River Meadowlands and Village Farmlands Landscape Character Types (LCT)
- East Nottinghamshire Sandlands RCA, which covers the Village Farmlands LCT
- South Nottinghamshire Farmlands RCA, which covers the Meadowlands and Village Farmlands LCT
- Mid-Nottinghamshire Farmlands RCA, which covers the Village Farmlands with Ancient Woodlands LCT

3.7.3 The study area also includes areas of urban development identified in the Newark & Sherwood Landscape Character Assessment SPD:

- Newark-on-Trent
- Farndon

3.7.4 Further details on these designations are set out in Chapter 7 (Landscape and Visual Effects) of the ES ~~(**TR010065/APP/6.1**contained within Volume 6.1)~~[APP-051]. The

Chapter considers any likely significant effects of the Scheme upon landscape features. The assessment considers both construction and operational phase effects.

3.8 Biodiversity

3.8.1 There are no designated sites of international importance (National Site Network or Ramsar sites) within 2 kilometres of the Scheme or within 200 metres of the affected road network (ARN). There are no sites within the National Site Network where bats are a qualifying feature within 30 kilometres of the Scheme.

3.8.2 Humber Estuary Ramsar, SAC and SPA are hydrologically connected to the Scheme, downstream of the River Trent. The Humber Estuary Ramsar and SAC are located approximately 53 kilometres directly from the Order Limits and 75 kilometres via the River Trent. The Humber Estuary SPA is located approximately 63 kilometres directly from the Order Limits and 75 kilometres via the River Trent. Given the distance of the SPA from the Order Limits and the nature of the qualifying feature for this designation (various bird species and the non-breeding waterfowl assemblage), the Scheme will not impact this designated site and so it has been scoped out of further assessment.

3.8.3 There are no sites of national importance located within 2 kilometres of the Scheme, none have hydrological links to the Scheme, and none are within 200 metres of the ARN.

3.8.4 There are two statutory designations of county importance (Local nature recovery (LNR) designated in the county context, with limited potential for substitution) located within 2 kilometres of the Scheme (Farndon Ponds LNR and Devon Park Pastures LNR).

3.8.5 Forty non-statutory designated sites of county importance are located within 2 kilometres of the Scheme and/or within 200 metres of the ARN.

3.8.6 Further details on these designations are set out in Chapter 8 (Biodiversity) of the ES ~~(**TR010065/APP/6.1**contained within Volume 6.1)~~[APP-052]. The Chapter considers any likely significant effects of the Scheme upon biodiversity features. The assessment considers both construction and operational phase effects.

3.9 Scheme aims and objectives

3.9.1 The main aims of the Scheme are to increase capacity and reduce traffic congestion on the A46 around Newark. This will directly contribute to the UK, regional and local government's transport and economic growth plans by improving connectivity from Lincolnshire to the national motorway network, and improving route standard

consistency for the A46, providing a consistent high standard dual carriageway between the Midlands and Lincoln.

3.9.2 Scheme-specific objectives have been used to develop the Design. Table 3-1 provides detail of how the Scheme meets each of the objectives.

Table 3-1 National Highways Scheme Objectives

Objective	Description	Detail of how the Scheme meets the objectives
Safety	Improving safety through Scheme design to reduce collisions for all users of the Scheme.	A COBALT assessment has been undertaken to assess the impact of the Scheme in terms of accidents over a 5-year period against a baseline of data obtained between 2015 and 2019. This shows overall that the Scheme would provide safety benefits equivalent to £29.3m over the 60-year appraisal period; translated into 8.6 fewer fatalities, 81.6 fewer serious accidents and 594.3 fewer accidents resulting in slight injuries. The overall impact is therefore positive, with a reduction in accidents and a reduction in casualties across all levels of severity. The results of this assessment are set out in the Transport Assessment (TA) ~~**(TR010065/APP/7.4)**~~[APP-193] which concludes the Scheme would overall have a positive impact on road safety and is not expected to result in any safety issues. Further details on safety are also set out in Chapter 5 of this Case for the Scheme.
Congestion	Improve journey time and journey time reliability along the A46 and its junctions between Farndon and Winthorpe, including all approaches and A1 slip	Chapter 4 of this Case for the Scheme and the TA ~~**(TR010065/APP/7.4)**~~[APP-193] forecast an improvement in journey times along the A46. This is due to the grade separation of the Cattle Market roundabout,

Objective	Description	Detail of how the Scheme meets the objectives
	roads.	allowing the mainline traffic to bypass the roundabout and giving traffic from the minor roads a lower opposing flow on the circulatory. There are forecast to be significant improvements to journey times on the A46 in both directions between Lodge Lane (south of Farndon roundabout) and Brough Lane (north of Winthorpe roundabout) as the result of the Scheme in both 2028 (opening year) and 2043 (15 years post opening). In 2028 the largest reductions in journey times are forecast to be in the PM peak, with journey times in the northbound direction reducing from approximately16 minutes down to 11 minutes, a saving of almost five minutes, or approximately 29%. The Scheme would increase capacity and reduce congestion on the existing A46 around Newark-on-Trent and would support future traffic growth.
Connectivity	Accommodate economic growth in Newark-on-Trent and the wider area by improving its strategic and local connectivity.	The Scheme would help support the delivery of planned new housing and employment growth within Newark-On-Trent. For example, the Newark Business Park represents a significant part of Newark's planned growth but is currently limited in its development by the lack of capacity at Brownhills roundabout. The TA [APP-193]~~(TR010065/APP/7.4)~~ outlines that delays at Brownhills roundabout are notably reduced in the AM and PM peaks due to the new layout of the A46 mainline

Objective	Description	Detail of how the Scheme meets the objectives
		which bypasses this section of the network. There are also a number of housing development sites identified within the Newark and Sherwood District Allocations and Development Management Development Plan Document, which rely on the Scheme to achieve their full completion as detailed within Section 3.12 of the Case for the Scheme. For example, Land East of Newark (as set out in Policy NAP 2B) is located between the A1, the East Coast Mainline and Beacon Hill Road. Traffic flows are, therefore, likely to be directed to the town center and its access to the A46 and the A1 through Beacon Hill Road. The Scheme would also help support the delivery of planned growth within the wider Midlands area. As detailed in Section 3.11 of the Case for the Scheme, the Scheme would ease traffic flows on key junctions of the A46, thereby unlocking investment listed in Table 3-2.
Environment	Deliver better environmental outcomes by achieving a net gain in biodiversity and improve noise levels at Noise Important Areas along the A46 between Farndon and Winthorpe junctions.	The Applicant has submitted a Biodiversity Net Gain (BNG) Technical Report in Appendix 8.14 of the ES Appendices [APP-159]~~(TR010065/APP/6.3)~~ which reports that the Scheme would result in a predicted net gain in biodiversity. Chapter 2 (The Scheme) of the ES [APP-047]~~(TR010065/APP/6.1~~contained within Volume 6.1~~)~~ outlines the provision of embedded mitigation

Objective	Description	Detail of how the Scheme meets the objectives
		for the Scheme including the provision of noise bunds and barriers integrated as part of the landscape design to reduce adverse effects to noise receptors where required. The locations are shown on Figure 2.3 Environmental Masterplan of the ES Figures [AS-026]~~(TR010065/APP/6.2)~~. Chapter 11 (Noise and Vibration) of the ES [APP-055]~~(TR010065/APP/6.1~~contained within Volume 6.1~~)~~ outlines the operational noise effects of the Scheme following the incorporation of mitigation measures. Table 11-37 of Chapter 11 (Noise and Vibration) of the ES [APP-055]~~(TR010065/APP/6.1~~contained within Volume 6.1) ~~~~provides a summary of the short-term noise impact at relevant Noise Important Areas, including a minor beneficial impact in 6 of the 11 relevant Noise Important Areas.
Customer	Build an inclusive Scheme which improves facilities for cyclists, walkers and other vulnerable users where existing routes are affected.	As set out in Section 4.14 of this Case for the Scheme, the Scheme seeks to provide facilities for cyclists, walkers and horse-riders (WCH) where existing routes are affected and seeks to improve facilities for all users where practical, including addressing historical severance issues. For example, historically there was a PRoW that ran north to south between Winthorpe and the Newark Showground. This has been severed by the existing A46 with FP2 ending at the northern boundary of the A46 and FP3 ending at the southern boundary. The Scheme would reconnect

Objective	Description	Detail of how the Scheme meets the objectives
		these two PRoWs via a new footway/cycleway that links with FP2 to the north and runs parallel to the new dual carriageway before crossing beneath it alongside the A1. On the south side of the new dual carriageway, it would cross the existing A46 via a new signalised crossing and join the existing PRoW network that provides a connection with FP3. A Walking, Cycling and Horse Riding Assessment and Review (WCHAR) was completed in June 2023 on the basis of the preliminary design and is available at Appendix C of TA [APP-193](~~**TR010065/APP/7.4**~~). A further WCHAR would follow at the detailed design stage to ensure that the needs of WCH users continue to be considered as the design progresses.

3.10 Scheme Description

3.10.1 The section of the A46 that is to be upgraded between Farndon and Winthorpe is approximately 6.5 kilometres in length. The Scheme comprises on-line widening for the majority of its length between Farndon roundabout and the A1. A new section of offline dual carriageway would be provided between the western and eastern sides of the A1 before the new dual carriageway ties into the existing A46 to the west of Winthorpe roundabout. The widening works include earthwork widening along the existing embankments, and new structures where the route crosses the railway lines, River Trent, the A1 and local roads.

3.10.2 The Scheme consists of the following principal elements:

- Widening of the existing A46 to a dual carriageway for a distance of approximately 6.5 kilometres to provide two traffic lanes in both directions.
- Partial signalisation of Farndon roundabout at the southern extents of the Scheme.

- A new grade separated junction at Cattle Market junction with the A46 elevated to pass over the roundabout. A larger roundabout beneath the A46 to provide increased capacity.
- A new off-line section to bypass the existing Brownhills roundabout and Friendly Farmer roundabout.
- A new grade separated northbound off slip to a new roundabout providing local access, with a two-way link road on the southern arm to connect with the existing Brownhills roundabout.
- A two-way parallel link road from Friendly Farmer to Winthorpe roundabout to the southern side of the existing dual carriageway.
- A new bridge structure across the existing A1, located to the north of the existing bridge.
- An upgraded roundabout with partial signal controls at Winthorpe roundabout.
- Improvements to WCH facilities through safer, enhanced routes.
- Three areas have been identified for floodplain compensation which are being referred to as the Kelham and Averham Floodplain Compensation Area (FCA), Farndon West FCA and Farndon East FCA. In addition, the Farndon East FCA and Farndon West FCA will also be used as a borrow pit to support the creation of embankments required for the Scheme.
- Drainage features including attenuation ponds.
- Environmental mitigation including landscape planting.
- Associated accommodation works and maintenance access tracks.

3.11 National Need for the Scheme

3.11.1 The DfT's Road Investment Strategy 2: 2020-2025 (RIS 2) sets out a long-term strategic vision for network investment for the second road period (RP2) between 2020 and 2025.

3.11.2 The Scheme aligns significantly with the RIS 2 objective of improving network provisions along the 'Trans-Midlands Trade Corridor' between the M5 and the Humber Ports, removing the bottleneck at the single-carriage section at Newark. RIS 2 commits to the development of the Newark Bypass between Farndon and the A1 junction with the aim to *'improve the capacity of the single carriageway and junctions of the A46 at Newark and provide better links to the A1'*.

3.11.3 RIS 2 is informed by the Route Strategies as a part of a rolling programme that sets out a plan for investment into the SRN. The North and East Midlands Route Strategy gathers wide-ranging evidence on the state of the network within the study area, including potential areas for investment opportunity, which in turn ensures that the development of RIS 2 makes the best use of taxpayer's money and that investments have the maximum impact.

3.11.4 National Highways' Strategic Business Plan responds to the publication of RIS 2 with a high-level direction for National Highways. It

outlines six key performance indicators (KPIs) and outcome areas to respond to and align with RIS 2 priorities.

3.11.5 The Scheme is designed to support the RIS 2 framework by meeting these priorities. The Scheme objectives have been aligned to meet National Highways' outcome areas, alongside the RIS 2 strategic outcomes, by reducing delays and congestion on the network and improving the journey time reliability of the A46.

3.11.6 The Scheme is well-placed to make a positive contribution towards a range of relevant strategies and policy, as summarised in Table 3-2.

Table 3-2 Scheme contribution and fit towards national strategy and policies

Policy/Strategy	Summary
DfT's Roads Investment Strategy 2: 2020-2025 (RIS 2)	The Scheme is aligned with the RIS 2 focus of making the SRN efficient and reliable for everyone, with the aim to *'improve the capacity of the single carriageway and junctions of the A46 at Newark and provide better links to the A1'*.
National Highways Route Strategy – North and East Midlands	The Scheme is explicitly referenced as a RIS 2 commitment.
National Highways Strategic Business Plan 2020 - 2025	The Scheme supports National Highways' commitment to meeting RIS 2 outcomes.
HM Treasury National Infrastructure Strategy (2020)	The Scheme is explicitly referenced within the National Infrastructure Strategy within reference to *'connecting nations and regions'*. This was included as a part of funding commitments referenced in the Spring 2020 budget.
HM Treasury National Infrastructure Delivery Plan 2016 - 2021	The Scheme is explicitly referenced under 'Midlands Roads' improvements.
DfT Transport Investment Strategy	The Scheme is supported by the function of the Sub-national Transport Bodies (STBs), particularly Midlands Connect, to highlight and address regional transport issues.
Levelling Up Fund (LUF)	The Scheme is not receiving LUF investment, however there is an interface with the

Policy/Strategy	Summary
	southern link road scheme, promoted by NSDC which has received £20 million in LUF funding and will link with the A46 south of Farndon.

3.11.7 Stretching for 155 miles from Gloucestershire to Lincolnshire, the A46 corridor is home to 5.5 million people and 2.9 million jobs, with an economic output of £115 million, 9% of the English economy as evidenced by Midlands Connect, the local Sub-National Transport Body. As evidenced by the Midlands Engine Partnership's Independent Economic Review (2020)11, the regional economy is dominated by road-reliant industries such as advanced manufacturing, automotive, aerospace, agriculture, distribution and textiles with manufacturing and engineering sectors alone accounting for 16.2% of regional Gross Value Added (GVA). With ports at either end of the corridor and East Midlands Airport (the UK's largest dedicated cargo airport) close by, the A46 is a nationally significant trade and export route. The regional freight sector accounts for export of £43 billion worth of goods to 178 countries (Midlands Connect, 2022).

3.11.8 D2N2 (Derby, Derbyshire, Nottingham, Nottinghamshire), which covers a significant part of the East Midlands region, is the sixth largest Local Enterprise Partnership (LEP) economy in the UK outside of London and the Southeast across 36 LEPs and combined authorities. D2N2, produces £48.4bn in GVA and has several industrial specialisms, such as manufacturing, generating £8.9bn in GVA, the second highest in the UK, in addition to transportation and storage, yielding £1.9bn GVA. Translated into the labour market, the D2N2 area has employment participation rate of 77.1% compared to the England average of 78.8%.

3.11.9 A key feature of the A46 is the reliance on journey time reliability and an efficient network. In its study Midlands Connect highlights that speed is frequently below 20 mph around Newark resulting in unreliable journey planning. This makes it difficult for export-reliant local businesses to effectively plan transport costs. Due to the just-in-time nature of modern deliveries, reliability is often considered to be more important than reduced journey times.

3.11.10 Nevertheless, some significant statistics (according to the Midlands Connect Business Corridor Survey in 2016 among 250 businesses) are:

- Half of the industries in the Midlands rely on the SRN for both international and national supply chains and connections to customers – 22% of goods

[11] https://www.midlandsengine.org/wp-content/uploads/2021/12/Midlands-Engine-IER-Full-Report.pdf

produced in the Corridor are exported and 85% of businesses use the A46 for long-distance journeys.

- An improvement in the A46 Corridor will raise overall business productivity – according to the survey with 65% believing it would allow them to recruit more staff.

3.11.11 In terms of growth, the wider East Midlands economy has seen a 30% growth rate between 2011 and 2020 with recorded higher growth rates in sectors such as food and supply and logistics. The corridor is expected to see further substantial growth and economic change in the period up to 2041, as outlined in Table 3-2. Midlands Connect, in its' A46 Vision, estimates the corridor as a whole is likely to see an additional 600,000 residents, 150,000 jobs, and 250,000 new homes.

3.11.12 The Scheme itself looks to strengthen a number of sectoral developments that are taking place across the wider Midlands area as outlined within Table 3-3.

Table 3-3 Sectoral developments within the wider Midlands area

Level	Development	Impacts
Regional	Humber Freeport	• Major opportunities for export-reliant businesses in the Midlands. • Improved connection between the coastline and inland areas, relying on the A46. • Catalyst for the development of the clean energy industry, particularly for wind farms.
	Automotive industry	• Mainly located between Coventry and Birmingham and benefiting from proximity to the A46. • Major industry for regional employment.
	Net Zero industry	• Strong public commitment to investing in the Net Zero industries. • Future private investments in the sector, e.g. ABLE Marine Energy Park. • The supply chain for the clean energy industry

Level	Development	Impacts
		particularly stretches along the A46.
	Enterprise Zones (EZs) • Nottingham and Derby EZ • Humber EZ • Loughborough and Leicester EZ • South Lincolnshire Food EZ	• Four EZs were identified within the wider influence area of the Scheme. There is strong potential for growth in all of them and more recently committed private investments.
	Food Valley (East Midlands)	• The area is key to supporting the UK food policy aiming to reduce food importation.

3.11.13 However, despite this there are some challenges. The economic performance and productivity of the Midlands lags behind the rest of England, particularly the Southeast. While key regional industries are dependent on the A46, their productivity is weakened by unreliable journey times and major bottlenecks along the A46.

3.11.14 D2N2, through its Strategic Economic Plan, has identified productivity improvement as a priority, as regional output is below the expected amount for the number of hours that are worked. This gap is due to a disproportionately high number of businesses with average level productivity, with a GVA per hour worked of £27.60, 12% below the UK average of £32.60. This is also slightly below surrounding regions of Leicester & Leicestershire (£28.80), Greater Manchester (£29.30) and Greater Birmingham & Solihull (£28.90) as of 2016.

3.11.15 Improvements to the SRN could contribute towards improved productivity in two key ways, strengthening a strategic road within the identified D2N2 high growth areas, and boosting the local economy within Newark-on-Trent.

3.11.16 A key need for the Scheme is improving safety through better layout and design standards. There are concerns about current compliance with design standards and observed accident and injury rates.

3.11.17 Personal Injury Accident (PIA) data has been obtained for an eight-year period from 01 January 2015 to 31 December 2022. PIA data includes data on road accidents reported to the police where at least one person is injured. Several people can be injured in one accident, resulting in multiple casualties being recorded.

3.11.18 Table 3-4 shows the overall number of PIAs and casualties at these key junctions. This analysis indicates that there were 131 PIAs that took place at one of the key junctions along the A46 over the eight-year period between 2015 and 2022, resulting in 163 casualties. Of the 131 PIAs, the highest number of incidents occurred at the Cattle Market roundabout, with 46 PIAs resulting in 60 casualties. Given that this stretch of the A46 is currently a single carriageway, incidents that lead to lane closures contribute to increased delay and poor journey time reliability through the network

Table 3-4 Total number of personal injury accidents and casualties at key junctions (2015-2022)

Junction	Total PIAs	Total Casualties
Farndon roundabout	23	25
Cattle Market roundabout	46	60
Brownhills roundabout	24	30
Friendly Farmer roundabout	28	36
Winthorpe roundabout	10	12
Total	**131**	**163**

3.11.19 An assessment has been made of the number of accidents, and their associated costs, using COBALT. COBALT assesses the safety aspects of road schemes using detailed inputs of either separate road links and road junctions that would be impacted by the Scheme, or combined links and junctions. The assessment is based on a comparison of accidents by severity and associated costs across an identified network in 'without Scheme' and 'with' Scheme forecasts, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction.

3.11.20 Full details of the COBALT assessment can be found in Appendix C Combined Modelling and Appraisal (ComMA) of the TA [APP-193](~~**TR010065/APP/7.4**~~). This assessment indicates that there are forecast to be around 494 fewer accidents and 685 fewer casualties as a result of the scheme over the 60-year appraisal period. the reduction of almost 500 accidents provides a monetised benefit of over £29m Further details on safety and the safety assessments undertaken can also be found in the TA [APP-193](~~**TR010065/APP/7.4**~~).

3.12 Local Need for the Scheme

3.12.1 The Newark and Sherwood district has a population of over 123,000, just under 15% of the population of Nottinghamshire making it the second largest of seven districts. The district demonstrates below average economic participation when compared to the UK. Economic activity rate is 72%, approximately six percentage points below the UK average. This is set out in Chapter 12 (Population and Human Health of the ES [REP3-011](~~**TR010065/APP/6.1**contained within Volume 6.1~~).

3.12.2 Newark and Sherwood are significantly less economically active compared to its neighbouring districts and the region it sits within. GVA per capita for Newark and Sherwood falls short of the East Midlands average and is significantly lower than England and UK averages.

3.12.3 Newark and Sherwood also has a lower concentration of skilled labour than regional and national averages, meaning industries are generally low skilled in nature. This is reflected in the Index of Multiple Deprivation (IMD)[12], which are produced by the Department for Levelling Up, Housing & Communities (DLUHC), and provides a ranking of the deprivation levels. The built-up area of Newark is formed of the Beacon Bridge, Castle and Devon wards and within each ward are a number of Lower Super Output Areas (LSOAs). IMD data (2019) shows that the wards with a higher proportion of deprived areas are Castle and Bridge and are amongst the 10% most deprived neighbourhoods in England.

3.12.4 As a result, as a part of the Levelling Up agenda, the Government has identified Newark as an area with the most significant need (economic recovery and growth; improved transport connectivity; regeneration) of investment and has been categorised in the highest Levelling Up tier. The overall categorisation is taken from the DLUHC index[13].

3.12.5 Recent strategic frameworks produced by Newark and Sherwood Council highlighted the key role of Newark in fostering future local growth. The strategy plans for a minimum of 9,080 new dwellings between 2013 and 2033. As of April 2016, 8,806 dwellings were still to be built and the Newark Urban Area is anticipated to absorb 60% of this housing growth. To ensure sustainable development in the area, the Core Strategy defines, in its Spatial Policy 5, five strategic sites, of which three are in Newark – land south of Newark, land east of Newark and land around Fernwood. These developments will provide 4,735 homes, concentrating most of Newark's growth. While Newark

[12] IMD Rankings English indices of deprivation 2019 - GOV.UK (www.gov.uk)

[13] Levelling Up Fund Round 2: updates to the Index of Priority Places - GOV.UK (www.gov.uk).

has two railway stations, the strategic approach also acknowledges the heavy reliance of the local economy on car use.

3.12.6 To support this population increase, additional 51.9 hectares (ha) of employment land will be provided in Newark Urban Area – 83.1 ha for the whole Newark and Sherwood district. Business developments are planned to be conducted around current industrial and commercial hubs. They will help diversify the local economy by promoting the service industry and increasing the number of 'knowledge-rich' businesses. To meet the area's targets the Newark & Sherwood Infrastructure Delivery Plan (IDP) has been developed. The purpose of the IDP is to identify the new/improved infrastructure required to facilitate planned growth within the District to the end of the plan period (2033). The Scheme is identified within the IDP, which states *"The Newark-on-Trent bypass is therefore now the only remaining section of single carriageway road on the A46(T) between Lincoln and Leicester. The bypass and the junctions along it experience frequent traffic congestion and in the Autumn statement of 2014 the Department for Transport announced its intention to improve this section of the A46(T) as part of its Roads Investment Strategy (RIS)."*

3.12.7 As a result, the Scheme is a key condition to unlocking growth in Newark-On-Trent, thus reaching the district's objectives: The IDP aims to strengthen growth in:

- Newark Business Park – The site concentrates a significant part of Newark's growth but is currently considered to be limited ~~in its development~~ by the available capacity at Brownhills roundabout bottleneck.
- Housing development sites, which ~~rely on~~would benefit from the Scheme to achieve their full completion – Land east of Newark is located between the A1, the East Coast Mainline and Beacon Hill Road. Traffic flows are, therefore, likely to be directed to the town centre and its access to the A46 and the A1 through Beacon Hill Road. Land south of Newark and land around Fernwood will directly benefit from the southern link road which will connect the A1 and the A46.

3.12.8 In this context, the Scheme is critical to ease traffic flows in

- The Newark Business Park area – The dualling of the slip road to Brownhills roundabout, as well as the addition of a new bridge over the A1, will considerably ease flows in and out of the Business Park and facilitate access to the A1.
- Major junctions – The IDP prioritises the Scheme to reduce congestion observed at the Cattle Market, Brownhills and Winthorpe junctions.

Table 3-5 Major development sites ~~within~~ in and around Newark-~~up~~on-Trent

Development	Summary of impacts on the network
Newark Showground	~~Catering for up to 3,000 people, the~~ Newark Showground is a major conference, exhibition and hospitality venue located to the north-east ~~infrastructure~~ of Newark-~~On~~on-Trent, ~~bringing important~~ generating significant traffic flows during its 500 annual events. It provides 8,000 free parking spaces and connects to the A46 and the A17. Most of the major events are held when traffic ~~counts~~ flows are at their lowest, i.e. during the weekend and during summer.
International Air and Space Training Institute (IASTI)	This £10.6m new development will be situated on the land vacated by the former Cattle Market, demolished in 2021. It will provide education and training to future pilots, engineers and ground crew, for up to 350 students, supported by 40 staff. The site will gain better access from the Scheme since it is located near the new planned flyover junction.
Newark Lorry Park	The current lorry park is situated between the Cattle Market and the A46. It occupies most of the Newark Gateway, which will be redeveloped (see below) and has spaces for 167 HGVs. The current proposal is to move it to the Showground site, which should provide better access both off the A46 and the A1.
Newark Gateway	While the redevelopment of the Newark Gateway area includes the International Air & Space Training Institute (IASTI), it also plans to build student accommodation for up to 300 students, a 100-bedroom hotel, a 2,100 sqm. Commercial unit, 2,706 sqm. Of high-tech offices and a public car park with 72 car spaces and two coach spaces.
Southern Link Road	This new 4-mile road in Newark-On-Trent will connect the A46 to the A1 near Fernwood. This project is an integral part of the Middlebeck scheme, which consists of 278 hectares of houses and retail units. It is estimated that up to 5,000 jobs could be created thanks to this development.
~~William~~ Witham St Hughs Development	Located in the North Kesteven district, between Lincoln and Newark-On-Trent and close to the A46, this neighbourhood is currently under development. 1,100 new homes and 150 retirement homes are planned on a 68.45-hectare site, alongside an improvement to the A46 Halfway House roundabout.

Development	Summary of impacts on the network
	The area is also receiving industrial development in the St Modwen Business Park, which expanded in recent years, increasing flows in the AM/PM peak periods.
North Hykeham Relief Road	This scheme will link the A46 (Lincoln Western Bypass) to the Lincoln Eastern Bypass, creating a dual carriageway ring-road around Lincoln. The scheme has received £110m in DfT funding and is scheduled for construction 2025-2028. This could potentially increase traffic flows on the A46 towards Newark which would not be addressed unless the Scheme is constructed.

4 Transport Case for the Scheme

4.1 Overview of transport modelling and appraisal

4.1.1 In order to assess the potential benefits of the Scheme, a suite of transport models has been used to forecast the expected travel demand, both with and without the Scheme in place.

4.2 Model suite

4.2.1 The Scheme has been assessed using the A46 Newark Bypass Model, which comprises three primary modelling components:

- The Highway Assignment Model (HAM) using SATURN (Simulation and Assignment of Traffic to Urban Road Networks) software to predict traffic flows, speeds, delays, routing and journey costs on the network, taking into account congestion. This is also referred to as the strategic model.
- The Variable Demand Model (VDM) which is used to predict the future levels of demand for private vehicle travel, taking into account trip generation, distribution and mode split.
- A microsimulation model, using VISSIM software, covering the Scheme corridor to enable detailed operational assessments of the Scheme junctions. Hereafter this is referred to as the operational model.

4.2.2 There is no public transport model assignment model, although a representation of rail costs and demands is included in the VDM so that impacts on modal split can be assessed.

4.3 Strategic highway assignment model

4.3.1 A number of existing regional transport models (RTM) were adapted to create the A46 Newark Bypass Model. The second generation of the Midland Regional Transport Model (MRTM2) has been used as the main starting point in the development of a base year for the A46 Newark Bypass Model, together with elements from the Trans-Pennine South Regional Transport Model (TPSRTM2) and the Enhanced A46 Regional Transport Model (MRTM).

4.3.2 The base year for the A46 Newark Bypass Model represents an average weekday (Monday to Friday) in March 2019. The base year model is based on mobile phone data collected in March 2019 from the National Highways Trip Information System (TIS) dataset. The data represents pre COVID-19 travel patterns. The HAM covers a single hour across the following three time-periods on a March weekday:

- AM peak hour (07:30 to 08:30)
- Inter peak (IP) average hour (10:00 to 16:00)
- PM peak hour (16:30 to 17:30)

4.3.3 The base year A46 Newark Bypass model is calibrated and validated against link flows, turning movements and journey times in accordance with TAG Unit M3.1, Highway Assignment Modelling.

4.3.4 The three modelled years have been defined based on information provided for the Scheme's construction and data availability for predicting future demand:

- 2028 (the year the Scheme is open to traffic).
- 2043 (an intermediate year, representing fifteen years after Scheme opening).
- 2061 (a horizon year – the last year for which National Trip End Model data is available, which forecasts the growth in traffic).

4.3.5 The following scenarios have been produced for each forecast year:

- Do Minimum (DM) scenario – this uses forecast future year trip matrices and future transport networks that excludes the Scheme.
- Do Something (DS) scenario – this replicates the Do Minimum forecasts, but also includes the Scheme.

4.3.6 Full details of the model development process are included in Chapter 3 of the TA [APP-193](~~**TR010065/APP/7.4**~~).

4.4 Existing network performance

4.4.1 The existing A46 forms part of England's SRN, forming part of the Trans-Midlands Trade Corridor between the M5 in the south-west and the Humber Ports in the north-east. The majority of the route is built to dual carriageway standard between Leicester and Lincoln, with the exception being the single carriageway section around Newark-on-Trent.

4.4.2 The section of the existing A46 between Farndon roundabout and Brownhills roundabout (A1/A46 Junction) is a wide single carriageway road, with one lane in each direction and a hatched central road markings to discourage overtaking. The section of the existing A46 between Friendly Farmer roundabout (A1/A46 Junction) and Winthorpe roundabout is a two-lane dual carriageway. The single and dual carriageway sections have a national speed limit of 60mph and 70mph, respectively.

4.5 Base year traffic flows

Strategic highway network

4.5.1 Traffic flows have been extracted from the base year (2019) strategic model for a number of sections of road along the A1, A46, A17, A617, A616 and A1133 corridors. Table 4-1~~Table 4-1~~ below summarises the annual average daily traffic (AADT) flows on each section of road.

4.5.2 This analysis indicates that in the base year (2019), the A46 between Farndon and Winthorpe roundabout carries between 28,300 and 41,800 vehicles per day, with around 15% of the traffic consisting of HGVs. The strategic model indicates that the busiest section of the A46 is currently between Brownhills roundabout and the A17.

Table 4-1: Two-way AADT forecasts on major routes in base year (2019)

Road	Section	Total vehicles	HGVs	% HGVs
A1	B6326 and Beacon Hill Rd	44,400	6,500	15%
A1	Beacon Hill Rd and A46	47,700	7,100	15%
A1	A46 and Great North Road	48,900	7,900	16%
A1	Great North Rd and Cromwell	46,600	7,900	17%
A46	Lodge Ln and Hawton Ln	36,600	4,700	13%
A46	Hawton Lane and B6166	36,600	4,700	13%
A46	B6166 and A617	28,300	4,200	15%
A46	A617 and A1	29,600	4,800	16%
A46	A1 and A17	48,100	7,300	15%
A46	A17 and A1133	41,800	6,000	14%
A46	A1133 and Brough Lane	36,200	5,300	15%
A17	Beckingham and Coddington	18,200	2,300	13%
A17	Coddington and A46	11,800	2,100	18%
A617	Hockerton and Averham	7,200	1,600	22%
A617	Averham and A46	16,900	2,500	15%
A616	A46 and South Muskham	12,600	1,200	10%
A616	South Muskham and Caunton	5,100	600	12%
A1133	West of Winthorpe	7,600	900	12%

Note: Total daily traffic in vehicles, all values rounded to nearest 100
Source: Analysis of A46 Strategic Model

A46 Junctions

4.5.3 Table 4-2~~Table 4-2~~ summarises the volume of traffic passing through each junction in the weekday AM and PM peak hours, as extracted from the operational model, providing an indication of the relative importance of each junction.

4.5.4 This analysis shows that the Friendly Farmer roundabout currently carries the highest volume of traffic across this section of the route, with around 4,500-4,700 vehicles in the weekday AM and PM peak hours.

Table 4-2: Summary of weekday peak hour traffic flows on A46 junctions in 2019

Junction	AM Peak	PM Peak
Farndon	3,399	3,400
Cattle Market	4,124	3,919
Brownhills	4,375	4,331
Friendly Farmer	4,692	4,541
Winthorpe	3,628	3,484

Source: Analysis of A46 Strategic Model

4.6 Overarching network performance

4.6.1 The operational model has been used to assess the performance of the Scheme and compares the 2019 base year network performance statistics across the whole network without the Scheme.

4.6.2 The analysis indicates that there are around 1,300 vehicles remaining in the network in both the weekday AM and PM peak hours, which is an indicator that there is a level of congestion in the base network.

Table 4-3: Base year network performance

Measure	Weekday AM Peak	Weekday PM Peak
Average delay (s)	103	92
Average number of stops	8	6
Average network speed (mph)	36	36
Average stopped delay (s)	25	23
Total distance travelled (mi)	68,755	65,575
Total travel time (h)	1,204	1,128
Total delay (h)	346	310
Total number of stops	100,371	77,425
Total stopped delay (h)	84	77
Remaining vehicles in network	1,355	1,249
Processed vehicles	10,725	10,882
Latent demand delay (m)	35	84
Latent Demand (vehs)	0	3

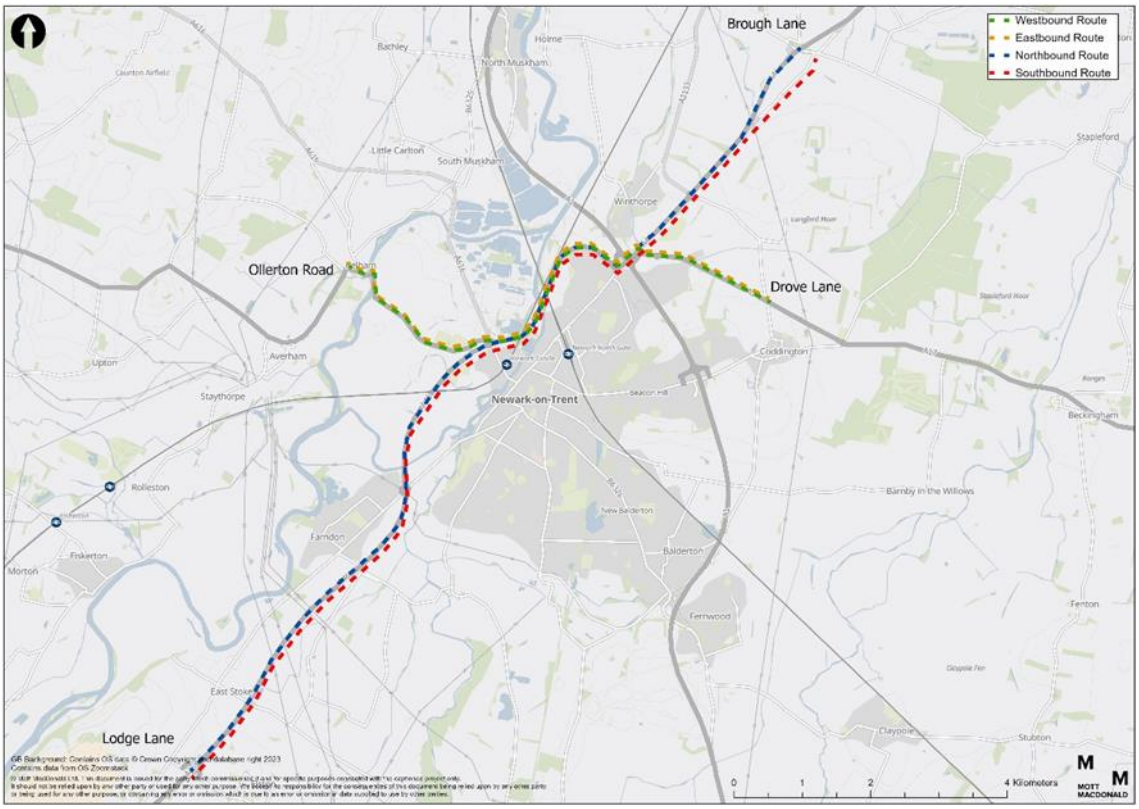
Source Combined Modelling and Appraisal Report, Appendix A of TA

Journey times

4.6.3 Base year journey times have been extracted from the operational model for the two routes shown in Figure 4-1. These routes include:

- A46 between Lodge Lane (south of Farndon roundabout) and Brough Lane (north of Winthorpe roundabout)
- A617 between Ollerton Road and Drove Lane

Figure 4-1 Operational model journey time routes



4.6.4 Table 4-4 summarises the weekday peak hour journey times in the base year. On this section of the A46, peak hour journey times are between 12 and 19 minutes in each direction, while on the A617, peak hour journey times are between eight and 12 minutes in each direction.

Table 4-4: Base year journey times (hh:mm:ss)

	AM Peak	PM peak
A46 NB	00:13:02	00:19:28
A46 SB	00:16:47	00:12:11
A617 EB	00:09:00	00:12:04
A617 WB	00:09:03	00:08:20

Source: Analysis of operational model

Junction performance

4.6.5 The operational model has been used to assess junction performance in the weekday peak hours. A summary of the performance of the key junctions on the A46 corridor in the 2019 base year is provided in Table 4-5. Further details of this analysis can be found in Chapter 5 of the TA [APP-193](~~**TR010065/APP/7.4**~~).

4.6.6 A junction operating with a Level of Service (LOS) of E is considered to be at capacity, while a junction operating with a LOS of F is considered to be over capacity. The LOS has been colour-coded with the lightest green as A through to a dark green as D, orange for E and red for F. This analysis indicates that the majority of junctions on this section of the A46 currently operate within capacity. The only exception is the Cattle Market roundabout which operates with a LOS of E, indicating that that the junction is operating at capacity.

Table 4-5: Summary of Overall Level of Service in base year assessments

Junction	AM Peak	PM Peak
Farndon	A	A
Cattle Market	E	E
Brownhills	B	C
Friendly Farmer	C	A
Winthorpe	A	A

Source: Analysis of operational model

4.7 Future network performance

Traffic flows

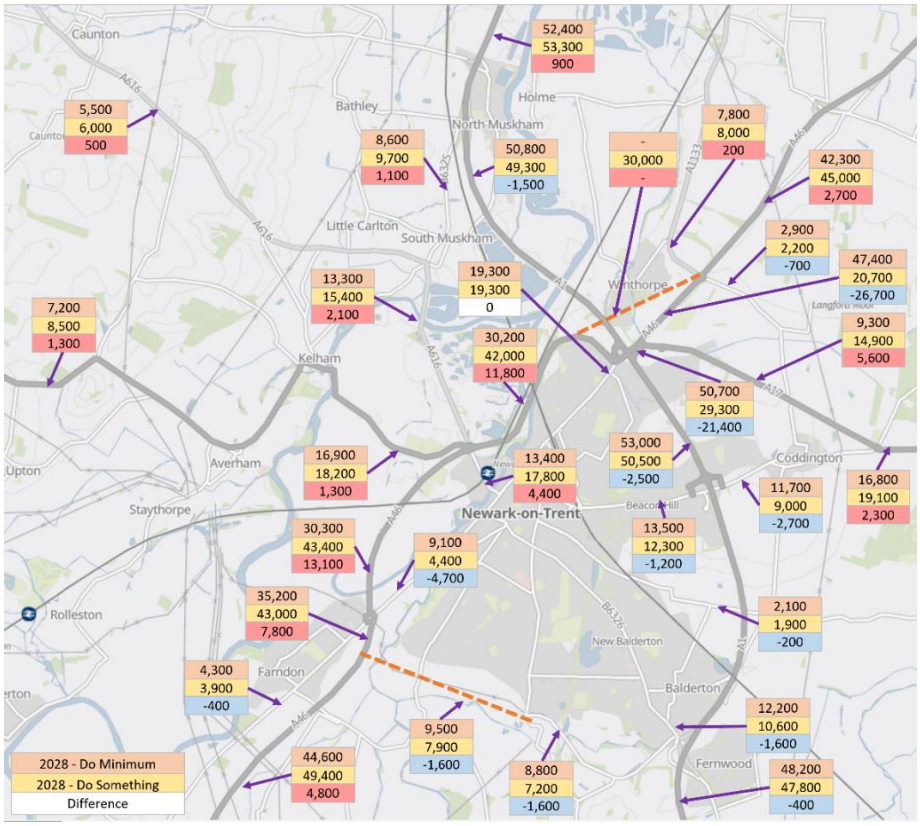
4.7.1 Forecasts with and without the Scheme have been prepared for each of the key sections of the A46, and for a range of other strategic routes that are likely to experience a change in traffic levels as a result of the Scheme.

4.7.2 Forecasts of Annual Average Daily Traffic (AADT) flows have been prepared for 2028 and 2043, which are shown in Figure 4-2 and Figure 4-3. All traffic flows are rounded to the nearest 100 vehicles.

4.7.3 The figures contain two dashed orange lines, which represent new sections of road that have been considered within the traffic modelling. The northern line represents the new bypass section of the Scheme, and the southern line represents the southern link road. The southern link road provides a new eastbound-westbound connection off the A46; and is being delivered by NSDC and is separate to this Scheme.

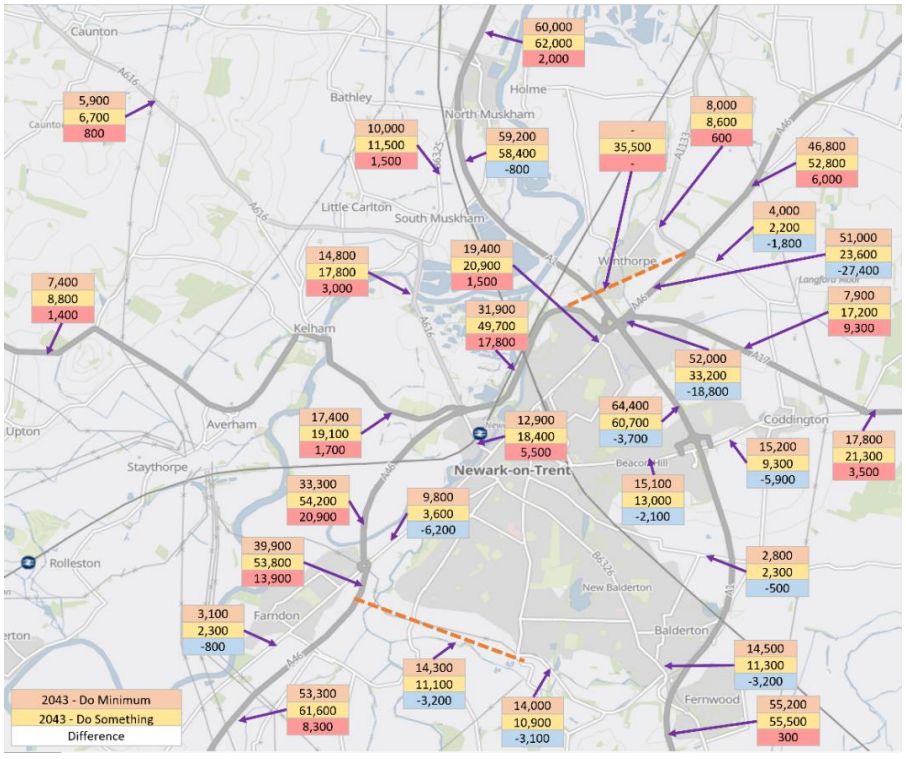
4.7.4 Overall, these figures indicate that there is forecast to be an increase in traffic on the A46 corridor because of the Scheme. Due to the increased capacity and reduced delay on the A46, there is forecast to be an overall reduction in the volume of traffic using the A1 corridor as traffic switches to the A46.

Figure 4-2: Forecast AADT 2028



Source: Combined Modelling and Appraisal Report, Appendix A of the TA

Figure 4-3: Forecast AADT 2043



Source: Source: Combined Modelling and Appraisal Report, Appendix A of the TA

4.8 Network performance

Strategic network performance – journey times

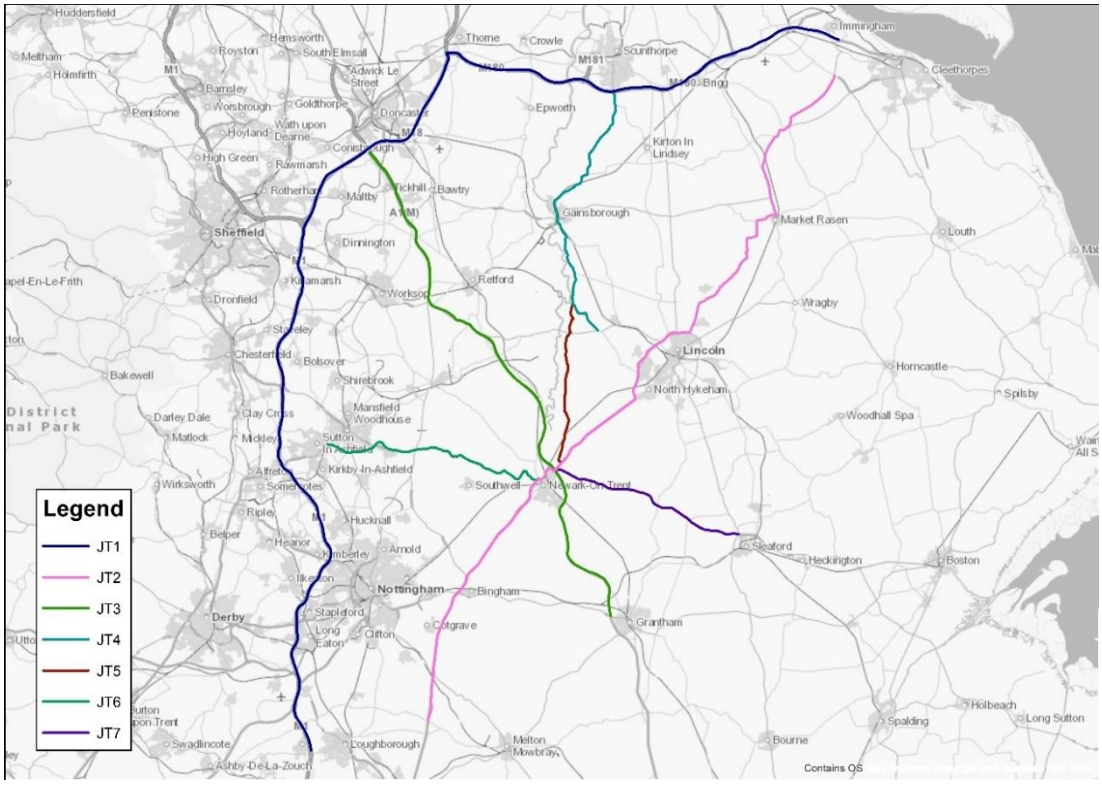
4.8.1 Forecast journey times have been extracted from the strategic model for the DM and DS scenarios to show how journey times are forecast to change across the region as a result of the Scheme.

4.8.2 As part of the strategic model validation process, journey time data was obtained by National Highways for nine routes in and around Newark-on-Trent. It should be noted that two of the routes, JT8 and JT9, represent shorter sections of routes JT2 and JT3 that are also covered by the operational model. Therefore, the analysis in this section focuses on journey time routes 1-7, which are shown in Figure 4-4.

4.8.3 The seven routes presented in this section include:

- JT1 – M1/M180/A1 from M1/A512 to A1173
- JT2 – A46/A1173 from Dalby Interchange to Riby
- JT3 – A1 from Grantham to Wadworth Interchange
- JT4 – A46/A1173 from Drinsey Nook to M180
- JT5 – A1133 from A46 to Torksey Lock
- JT6 – A617 from A38 to A46
- JT7 – A17 from A46 to A15

Figure 4-4 Strategic journey time routes



Source: Combined Modelling and Appraisal Report, Appendix A of the TA

4.8.4 Table 4-6 and Table 4-7 below compare the journey times across the network in 2028 and 2043 with and without the Scheme.

4.8.5 There are forecast to be improvements to journey times on the A46 (JT2) in both directions as result of the Scheme in both 2028 and 2043, with a reduction of around 3-5% in the weekday AM and PM peak hours. This equates to savings of around 3-5 minutes on journeys that take around 1 hour 30 minutes.

4.8.6 There are also forecast to be reductions in journey times on the A617 (JT6) and A17 (JT7) corridors as a result of the Scheme. Journey times savings are broadly comparable between 2028 and 2043, with the journey times on the A617 forecast to reduce in the AM peak by around 6% in the eastbound direction. Journey times on the A17 are forecast to reduce in the PM peak by around 7% in the westbound direction.

4.8.7 Journey times on all other routes are forecast to remain largely unchanged as a result of the Scheme.

Table 4-6 Comparison of journey times in 2028 with and without the Scheme (hh:mm:ss)

		Weekday AM Peak				Weekday PM Peak			
Route		DM	DS	Change	%	DM	DS	Change	%
JT1	NB	01:42:24	01:42:11	-00:00:13	0%	01:41:11	01:40:57	-00:00:14	0%
	SB	01:38:52	01:38:46	-00:00:06	0%	01:36:17	01:36:14	-00:00:03	0%
JT2	NB	01:27:28	01:25:02	-00:02:26	-3%	01:31:29	01:27:37	-00:03:52	-4%
	SB	01:34:02	01:31:17	-00:02:45	-3%	01:29:16	01:26:42	-00:02:34	-3%
JT3	NB	00:44:03	00:44:06	00:00:03	0%	00:46:07	00:46:11	00:00:04	0%
	SB	00:44:52	00:44:48	-00:00:04	0%	00:44:11	00:44:15	00:00:04	0%
JT4	NB	00:37:51	00:37:55	00:00:04	0%	00:38:06	00:38:13	00:00:07	0%
	SB	00:37:53	00:37:53	00:00:00	0%	00:37:40	00:37:42	00:00:02	0%
JT5	NB	00:19:42	00:19:47	00:00:05	0%	00:19:59	00:20:12	00:00:13	1%
	SB	00:19:48	00:19:44	-00:00:04	0%	00:19:44	00:19:42	-00:00:02	0%
JT6	EB	00:33:42	00:32:11	-00:01:31	-5%	00:31:14	00:30:45	-00:00:29	-2%
	WB	00:31:35	00:31:54	00:00:19	1%	00:31:33	00:31:46	00:00:13	1%
JT7	EB	00:22:26	00:22:42	00:00:16	1%	00:21:57	00:22:10	00:00:13	1%
	WB	00:24:06	00:23:02	-00:01:04	-4%	00:23:08	00:22:01	-00:01:07	-5%

Source: Analysis of A46 Strategic Model

Table 4-7 Comparison of journey times in 2043 with and without the Scheme (hh:mm:ss)

		Weekday AM Peak				Weekday PM Peak			
Route		DM	DS	Change	%	DM	DS	Change	%
JT1	NB	01:48:21	01:47:57	-00:00:24	0%	01:48:31	01:48:07	-00:00:24	0%
	SB	01:44:45	01:44:28	-00:00:17	0%	01:41:49	01:42:22	00:00:33	1%
JT2	NB	01:32:43	01:29:41	-00:03:02	-3%	01:36:06	01:31:45	-00:04:21	-5%
	SB	01:38:02	01:34:06	-00:03:56	-4%	01:33:11	01:30:43	-00:02:28	-3%

		Weekday AM Peak				Weekday PM Peak			
Route		DM	DS	Change	%	DM	DS	Change	%
JT3	NB	00:46:25	00:46:33	00:00:08	0%	00:48:59	00:49:13	00:00:14	0%
	SB	00:46:34	00:46:31	-00:00:03	0%	00:45:33	00:45:53	00:00:20	1%
JT4	NB	00:38:11	00:38:15	00:00:04	0%	00:38:36	00:38:47	00:00:11	0%
	SB	00:38:10	00:38:11	00:00:01	0%	00:38:01	00:38:03	00:00:02	0%
JT5	NB	00:19:55	00:19:58	00:00:03	0%	00:20:18	00:20:54	00:00:36	3%
	SB	00:19:55	00:19:53	-00:00:02	0%	00:19:55	00:19:53	-00:00:02	0%
JT6	EB	00:35:42	00:33:44	-00:01:58	-6%	00:31:56	00:31:22	-00:00:34	-2%
	WB	00:31:59	00:32:24	00:00:25	1%	00:32:10	00:32:53	00:00:43	2%
JT7	EB	00:23:32	00:24:01	00:00:29	2%	00:23:02	00:23:17	00:00:15	1%
	WB	00:24:59	00:24:18	-00:00:41	-3%	00:24:59	00:23:18	-00:01:41	-7%

Source: Analysis of A46 Strategic Model

4.8.8 In summary, this journey time analysis demonstrates that there are forecast to be improvements to weekday peak hour journey times on the A46 in both directions between Dalby Interchange and Riby (JT2) as result of the Scheme. Improving journey times and journey time reliability along the A46 and its junctions between Farndon and Winthorpe is one of the key objectives of the Scheme. The information presented in this section demonstrates how the Scheme is forecast to meet this objective.

4.9 Local network performance

Overarching network performance

4.9.1 The operational model has been used to assess the performance of the Scheme. Table 4-8 and Table 4-9 compare network performance across the whole network with (DS) and without (DM) the Scheme in 2028 and 2043 respectively.

4.9.2 This analysis broadly indicates that the Scheme is likely to result in additional traffic using the network in both the weekday AM and PM peak hours in 2028 and 2043. However, despite the increase in the number of vehicles using the network, average delay is forecast to reduce substantially as a result of the Scheme.

4.9.3 Further details are included in Chapter 6 of the TA [APP-193](~~**TR010065/APP/7.4**~~).

Table 4-8: Comparison of network performance in 2028 with (DS) and without (DM) the Scheme

	Weekday AM Peak			Weekday PM Peak		
Measure	**DM**	**DS**	**% Change**	**DM**	**DS**	**% Change**
Average delay (s)	60	55	-8%	76	53	-30%
Average number of stops	3	2	-33%	4	1	-75%
Average network speed (mph)	40	41	+2%	38	42	+11%
Average stopped delay (s)	16	19	+19%	22	20	-9%

Total distance travelled (mi)	45,383	54,223	+19%	44,389	54,030	+22%
Total travel time (h)	1,125	1,308	+16%	1,171	1,299	+11%
Total delay (h)	216	213	-1%	281	211	-25%
Total number of stops	34,457	23,647	-31%	52,903	21,213	-60%
Total stopped delay (h)	57	72	+27%	80	82	+2%
Remaining vehicles in network	1,201	1,347	+12%	1,251	1,343	+7%
Processed vehicles	11,726	12,621	+8%	12,130	13,115	+8%
Latent demand delay (m)	28	46	+68%	174	132	-24%
Latent Demand (vehs)	1	0	-100%	4	6	50%

Source Analysis of operational model

Table 4-9: Comparison of network performance in 2043 with (DS) and without (DM) the Scheme

	Weekday AM Peak			Weekday PM Peak		
Measure	**DM**	**DS**	**% Change**	**DM**	**DS**	**% Change**
Average delay (s)	92	81	-12%	111	70	-37%
Average number of stops	7	3	-57%	7	3	-57%
Average network speed (mph)	37	39	+5%	35	40	+14%
Average stopped delay (s)	23	26	+13%	25	25	0%
Total distance travelled (mi)	52,586	64,935	+23%	51,425	65,313	+27%
Total travel time (h)	1,429	1,671	+17%	1,492	1,632	+9%
Total delay (h)	387	371	-4%	475	329	-31%
Total number of stops	109,440	53,810	-51%	108,247	42,697	-61%
Total stopped delay (h)	95	121	+27%	108	120	+12%
Remaining vehicles in network	1,596	1,789	+12%	1,713	1,700	-1%
Processed vehicles	13,488	14,701	+9%	13,717	15,288	11%
Latent demand delay (m)	60	60	+1%	189	150	-21%
Latent Demand (vehs)	4	1	-75%	11	10	-9%

Source: Analysis of operational model

Journey times

4.9.4 Forecast journey times in the weekday peak hours have been extracted from the operational model for the DM and DS scenarios to show how journey times are forecast to change as a result of the Scheme extends as result of the Scheme.

4.9.5 Journey times have been extracted for the A46 between Lodge Lane (south of Farndon roundabout) and Brough Lane (north of Winthorpe roundabout), and the A617 between Ollerton Road and Drive Lane. Table 4-10 and Table 4-11 below compare the journey times in 2028 and 2043 in the DM and DS scenarios.

4.9.6 This analysis broadly indicates that there are forecast to be substantial improvements to journey times on the A46 in both directions between Lodge Lane (south of Farndon roundabout) and Brough Lane (north of Winthorpe roundabout), as result of the Scheme in both 2028 and 2043. In 2043 there are forecast to be journey time savings of around seven minutes in each direction in the PM peak as a result of the Scheme.

Table 4-10: Comparison of journey times in 2028 with and without the Scheme (hh:mm:ss)

	Weekday AM Peak				Weekday PM Peak			
	DM	DS	Change	% Change	DM	DS	Change	% Change
A46 NB	00:12:57	00:11:21	-00:01:36	-12%	00:16:12	00:11:26	-00:04:46	-29%
A46 SB	00:13:06	00:11:17	-00:01:49	-14%	00:12:37	00:11:06	-00:01:31	-12%
A617 EB	00:08:39	00:08:51	00:00:12	+2%	00:09:21	00:09:08	-00:00:13	-2%
A617 WB	00:08:44	00:08:52	00:00:08	+2%	00:08:27	00:08:17	-00:00:10	-2%

Source: Analysis of operational model

Table 4-11: Comparison of journey times in 2043 with and without the Scheme (hh:mm:ss)

	Weekday AM Peak				Weekday PM Peak			
	DM	DS	Change	% Change	DM	DS	Change	% Change
A46 NB	00:14:25	00:11:43	-00:02:42	-19%	00:18:36	00:11:41	-00:06:55	-37%
A46 SB	00:13:30	00:11:28	-00:02:02	-15%	00:14:59	00:07:58	-00:07:01	-47%
A617 EB	00:10:04	00:09:45	-00:00:19	-3%	00:10:17	00:11:46	00:01:29	+14%
A617 WB	00:09:06	00:09:53	00:00:47	+9%	00:10:40	00:08:55	-00:01:45	-16%

Source: Analysis of operational model

Delays from strategic model

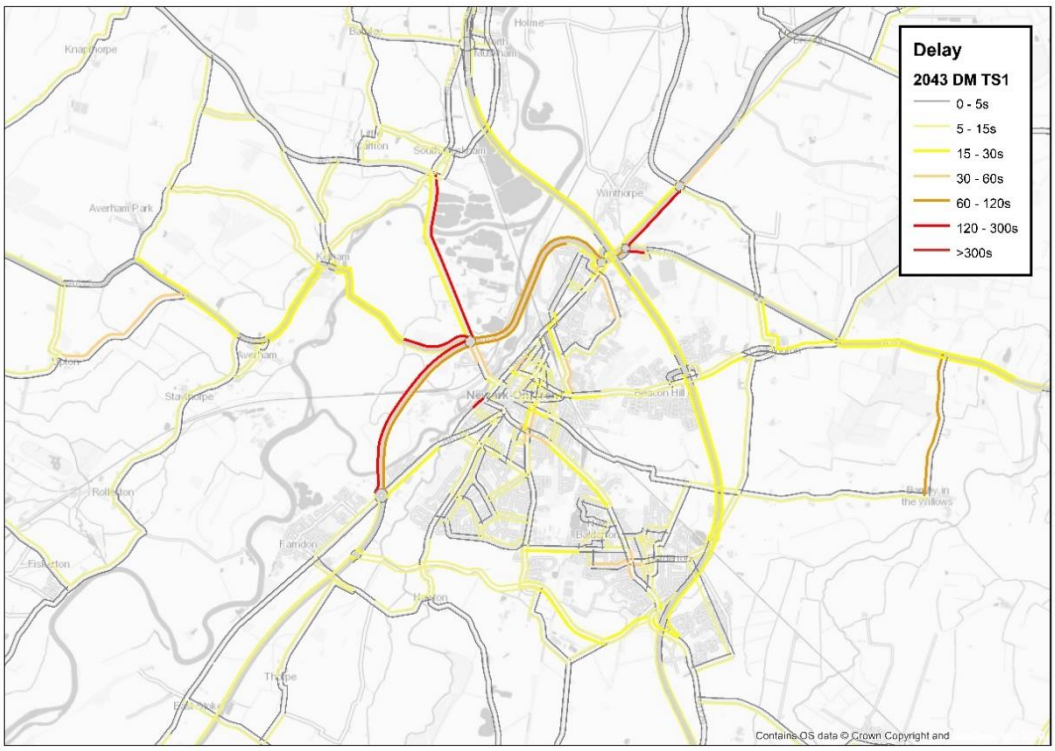
4.9.7 Vehicle delay has been extracted from the strategic model to show how delay is forecast to change as a result of the Scheme.

4.9.8 Figure 4-5 to Figure 4-8 present peak weekday hour link delays for the DM and DS scenario in 2043. (15 years post opening). The analysis focuses on 2043 as traffic flows are forecast to be higher than in 2028 (opening year).

4.9.9 The figures show a reduction in link delay along the A46 mainline with the introduction of the scheme. Delays on the approaches to the Cattle Market roundabout reduce in the DS scenario. This is due to the introduction of grade separation at the junction which allows mainline traffic to bypass the roundabout, leading to the minor arms having to give-way to less traffic on the circulatory. Delays at the Brownhills and Friendly Farmer roundabouts are notably reduced in the weekday AM and PM peaks due to the new layout of the A46 mainline which bypasses this section of the network.

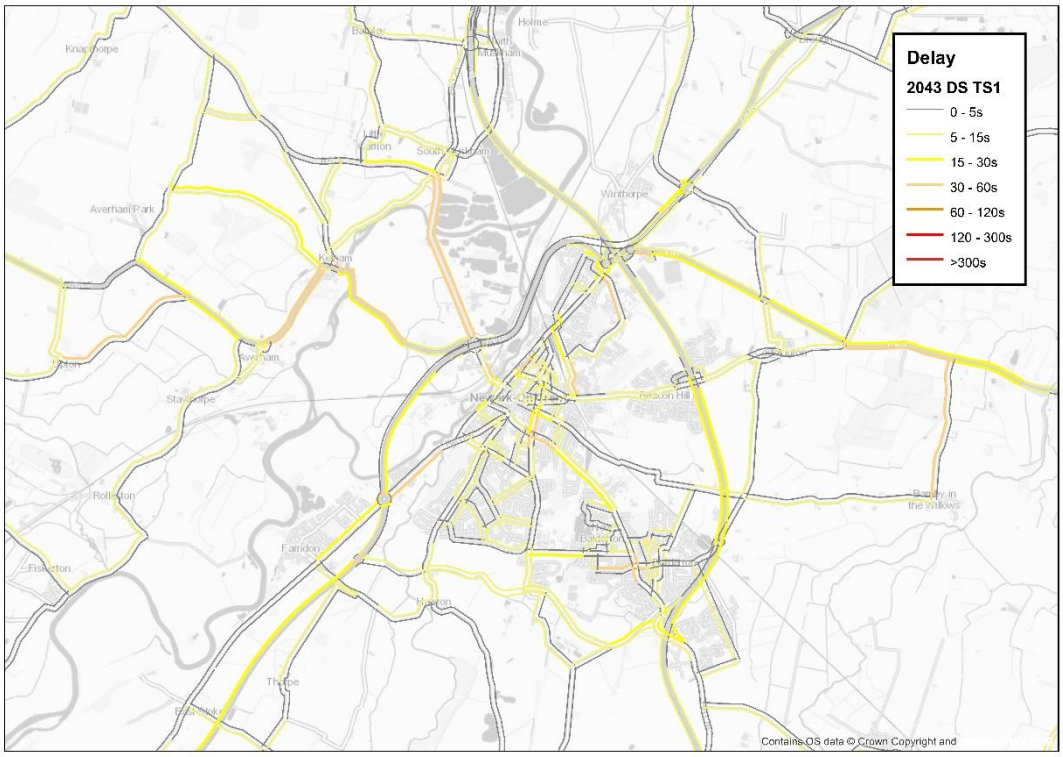
4.9.10 This analysis indicates that despite the network being used by substantially more traffic as a result of the Scheme, delays across the network are forecast to be reduced.

Figure 4-5: 2043 DM link delays (AM peak)



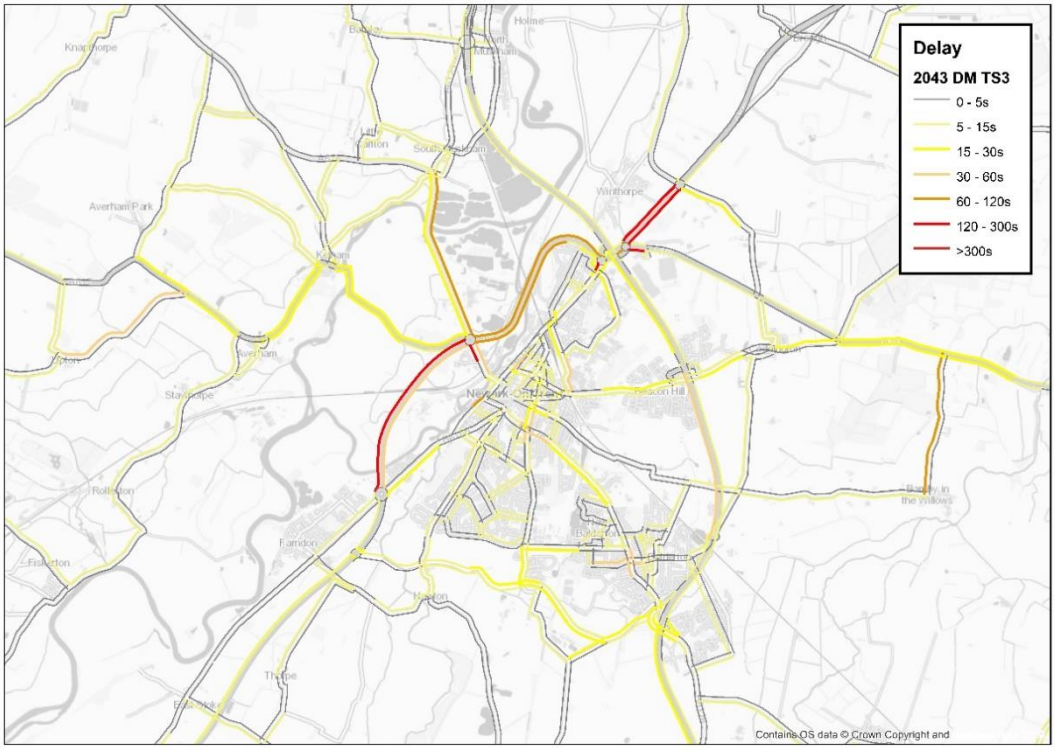
Source: Combined Modelling and Appraisal Report, Appendix A of the TA

Figure 4-6: 2043 DS link delays (AM peak)



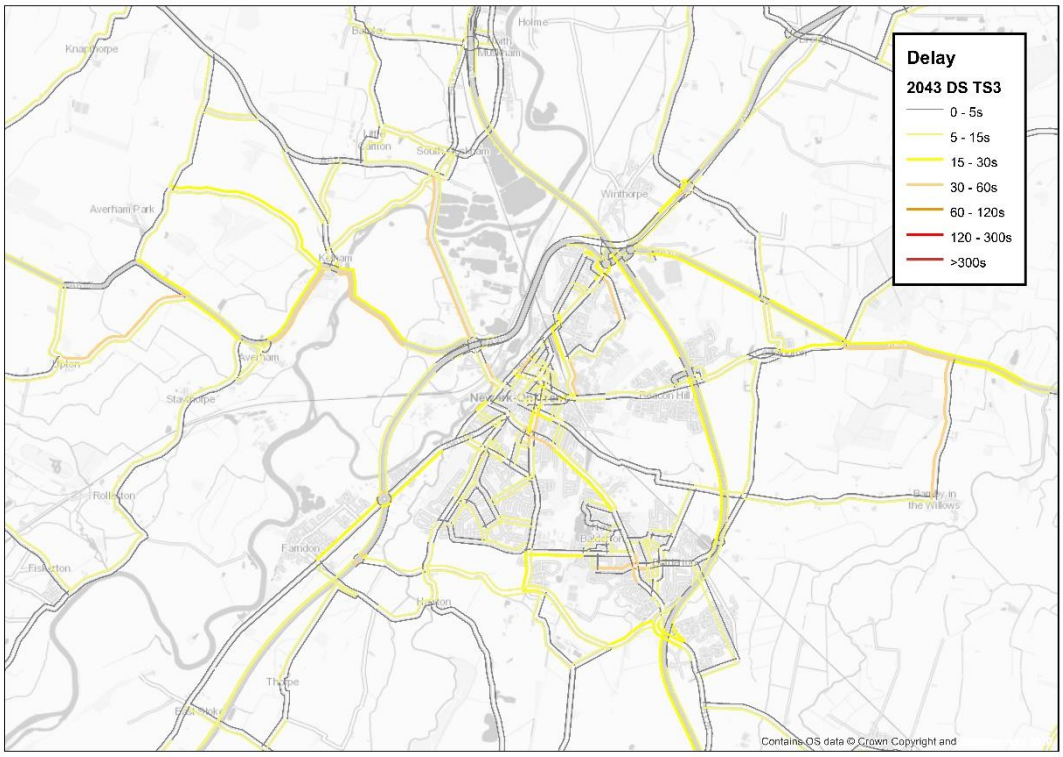
Source: Combined Modelling and Appraisal Report, Appendix A of the TA

Figure 4-7: 2043 DM link delays (PM peak)



Source: Combined Modelling and Appraisal Report, Appendix A of the TA

Figure 4-8: 2043 DS link delays (PM peak)



Source: Combined Modelling and Appraisal Report, Appendix A of the TA

4.10 Summary

4.10.1 In summary, the operational model indicates that that whilst the Scheme is likely to result in additional traffic using the network, average delay and journey times between Lodge Lane (south of Farndon roundabout) and Brough Lane (north of Winthorpe roundabout) are forecast to reduce substantially as a result of the Scheme. In 2043 there are forecast to be journey time savings of around seven minutes in each direction in the PM peak as a result of the Scheme.

4.10.2 Improving journey times and journey time reliability along the A46 and its junctions between Farndon and Winthorpe is one of the key objectives of the Scheme. Information presented in this section demonstrates how the Scheme is forecast to meet this objective.

4.11 Junction performance

4.11.1 A summary of the operational modelling undertaken in this section is provided in Table 4-12 and Table 4-13. Full details of the operational assessments are included in Chapter 6 of the TA [APP-193](~~TR010065/APP/7.4~~).

4.11.2 This analysis indicates that the Cattle Market roundabout is forecast to experience a substantial improvement in performance as a result of the Scheme in both 2028 (opening year) and 2043 (15 years post opening). All other junctions are forecast to continue to operate well within capacity with the Scheme.

Table 4-12: Summary of Level of Service in operational assessments (2028)

Junction	Peak Hour	Overall LoS		Summary of assessment
		DM	DS	
Farndon	**AM**	**A**	**A**	**Junction operating well within capacity**
	PM	**A**	**A**	
Cattle Market	**AM**	**D**	**A**	**Substantial improvement in performance**
	PM	**E**	**A**	
Brownhills	**AM**	**B**	**A**	**Junction operating well within capacity**
	PM	**C**	**B**	
New roundabout north of Brownhills	**AM**	**-**	**A**	**Junction operating well within capacity**
	PM	**-**	**A**	
Friendly Farmer	**AM**	**B**	**B**	**Junction operating well within capacity**
	PM	**A**	**B**	
Winthorpe	**AM**	**A**	**B**	**Junction operating well within capacity**
	PM	**A**	**B**	

Source: Mott MacDonald Analysis of operational model

Table 4-13: Summary of Level of Service in operational assessments (2043)

Junction	Peak Hour	Overall LoS		Summary of assessment
		DM	DS	
Farndon	**AM**	**A**	**A**	**Junction operating well within capacity**
	PM	**A**	**A**	
Cattle Market	**AM**	**E**	**B**	**Substantial improvement in performance**
	PM	**F**	**B**	
Brownhills	**AM**	**C**	**B**	**Junction operating well within capacity**
	PM	**C**	**C**	
New roundabout	**AM**	**-**	**A**	**Junction operating well within**

Junction	Peak Hour	Overall LoS		Summary of assessment
		DM	DS	
north of Brownhills	**PM**	**-**	**A**	**capacity**
Friendly Farmer	**AM**	**B**	**C**	**Junction operating well within capacity**
	PM	**A**	**B**	
Winthorpe	**AM**	**A**	**B**	**Junction operating well within capacity**
	PM	**A**	**B**	

Source: Mott Macdonald Analysis of operational model

4.12 Road safety

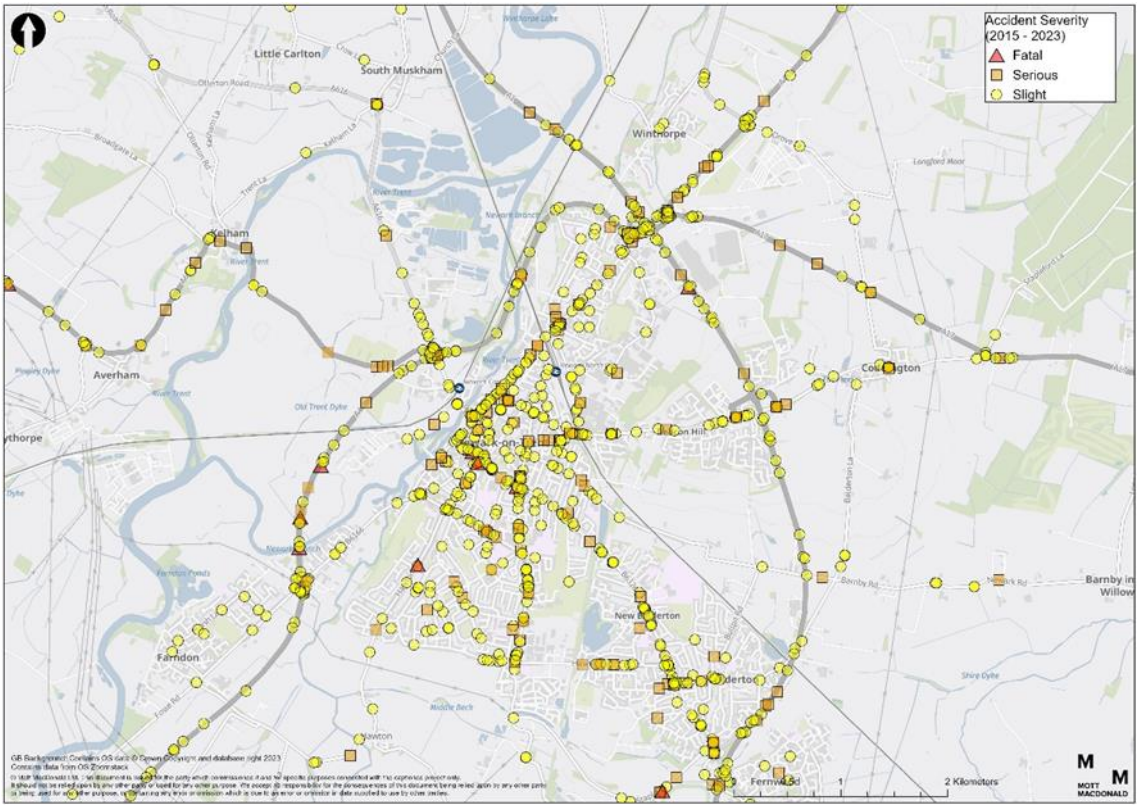
Existing accident analysis

4.12.1 The economic appraisal for the Scheme includes monetised benefits associated with improved road safety. This assessment was based on Personal Injury Accident (PIA) data obtained from the DfT's Road Safety Data website (Stats19) for the full five-year period from 2015 to 2019 (pre-Covid). Accident data was collated for the whole of the Newark-on-Trent area.

4.12.2 For the purposes of the Transport Assessment, up-to-date PIA data has been obtained for the study area from Via in Nottinghamshire, who maintain the Stats19 database within the area covered by Nottinghamshire Police. This data covers an eight-year period from 01 January 2015 to 31 December 2022.

4.12.3 Figure 4-9 shows the location of the PIAs in the study area by severity. This indicates that the vast majority of accidents are clustered around key junctions along the A46 corridor.

Figure 4-9: Accidents by severity in Newark-on-Trent



Source: Analysis of *STATS19 Data*

4.12.4 Table 4-14 below summarises the number of PIAs and resulting casualties by severity that have occurred between 2015 and 2022.

4.12.5 This analysis indicates that there have been 1,024 PIAs over the eight-year period, resulting in 1,358 casualties, of which 13 were fatal (1%), 179 were serious (13%) and 1,166 were slight (86%).

Table 4-14: Personal injury accidents and casualties by severity

	Accidents				Casualties			
Year	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total
2015	**1**	**28**	**131**	160	**1**	**31**	**183**	215
2016	**3**	**18**	**122**	143	**3**	**18**	**179**	200
2017	**3**	**22**	**141**	166	**3**	**25**	**194**	222
2018	**3**	**21**	**117**	141	**3**	**22**	**168**	193
2019	**0**	**20**	**112**	132	**0**	**22**	**139**	161
2020	**1**	**13**	**66**	80	**1**	**13**	**84**	98
2021	**1**	**24**	**78**	103	**1**	**26**	**114**	141
2022	**1**	**19**	**79**	99	**1**	**22**	**105**	128

	Accidents				Casualties			
Year	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total
Total	13	165	846	1,024	13	179	1,166	1,358

Source: Analysis of *STATS19 Data*

Road Safety Audit 1 and Designer's Response

4.12.6 The Stage One Road Safety Audit (RSA1) has been undertaken during the preliminary design of the Scheme in line with the National Highways standard, DMRB GG 119 'Road safety audit' revision two.

4.12.7 The findings of the RSA1 have been fully reviewed by qualified Highway Designers, and audit recommendations have been accepted where appropriate. Further details on the Road Safety Audit can be found in Chapter 4 (Road Safety) of the TA [APP-193](~~**TR010065/APP/7.4)**~~.

4.13 Scheme benefits

4.13.1 An assessment has been made of the number of accidents, and their associated costs, using COBALT. COBALT assesses the safety aspects of road schemes using detailed inputs of either separate road links and road junctions that would be impacted by the Scheme, or combined links and junctions. The assessment is based on a comparison of accidents by severity and associated costs across an identified network in 'without scheme' and 'with' Scheme forecasts, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction.

4.13.2 Table 4-15 shows the decrease in the predicted number of accidents and casualties over the 60-year assessment period for the wider study area. This indicates that there are forecast to be around 494 fewer accidents and 685 fewer casualties as a result of the Scheme over the 60-year appraisal period.

Table 4-15: Predicted accident reductions (60-year period)

Impact		Do Minimum (without scheme)	Do Something (with scheme)	Savings due to Scheme
Accident costs (2010 prices discounted to 2010, £m)		8,191.4	8,162.1	29.3
Number of Personal Injury Accidents (PIAs)		191,688.0	191,194.5	493.5
Number of casualties	Fatal	2,983.4	2,974.8	8.6
	Serious	26,699.4	26,617.8	81.6
	Slight	240,327.6	239,733.3	594.3

	Total	**270,010.4**	**269,325.9**	**684.5**

Source: Combined Modelling and Appraisal Report, Appendix A of the TA

4.13.3 Table 4-16 shows the forecast monetary benefits due to the Scheme. This indicates that the reduction of almost 500 accidents provides a monetised benefit of over £29m.

Table 4-16 Forecast accident impacts by COBALT element

COBALT Element	**Accident reduction**	**Benefits due to Scheme** (2010 prices, discounted to 2010)
Links	210.1	£15.3
Junctions	338.7	£10.1
Combined	-55.3	£3.9
Total	**493.5**	**£29.3**

Source: Combined Modelling and Appraisal Report, Appendix A of the TA

4.13.4 Further details on the analysis undertaken into the impacts of the Scheme on road safety in the local area and further afield including the COBALT (cost and benefit to accidents – light touch) assessment can be found in Chapter 4 (Road Safety) of the TA [APP-193](~~**TR010065/APP/7.4**~~).

4.14 Sustainable transport

4.14.1 An overview for travel in the vicinity of the Scheme by sustainable modes of transport, including WCH and public transport is provided in Chapter 7 (Sustainable Transport) of the TA [APP-193](~~**TR010065/APP/7.4**~~). This chapter also identifies the improvements and enhancements delivered as part of the Scheme.

Walking, cycling and horse-riding

4.14.2 There are likely to be both beneficial and adverse impacts upon people's journey patterns and amenity resulting from the Scheme. These impacts will include some diversions of some routes, but there are also opportunities to improve conditions for WCH's through new routes and improved crossings.

4.14.3 The General Arrangement Plans [AS-007](~~**TR010065/APP/2.5**~~) and the Streets Rights of Way and Access Plans [REP4-002](~~**TR010065/APP/2.4**~~) illustrate the locations of:

- The existing PRoW network within and surrounding the Order Limits.
- The PRoW route that would be permanently closed (referred to as being 'stopped up').
- New and improved walking and cycling routes that would be delivered as part of the Scheme.

4.14.4 The routes impacted/proposed by the Scheme are listed below and detailed in full in Chapter 2 (The Scheme) of the ES [APP-046](~~**TR010065/APP/6.1**~~contained within Volume 6.1~~)~~:

- **Footpath FP14** – This footpath crosses the existing A46 from north to south via an uncontrolled crossing. The Scheme would stop up the footpath where it crosses the A46 for safety reasons and provide new and improved facilities around the east side of Cattle Market Roundabout which would be available as an alternative route.
- **Footway/Cycle track at Cattle Market** – The existing footway/cycle track around Cattle Market provides a link between the walking and cycling facilities present on the A617, A616 and Great North Road. An uncontrolled crossing is provided for users to cross the northern A616 arm of Cattle Market and two signalised crossings provided for them to cross the eastern A46 arm. This route forms part of the 'Trent Valley Way' long distance walking route. Signalised crossings would be provided as part of the Scheme around the enlarged Cattle Market junction circulatory to maintain/improve these links.
- **Footway/Cycle track at Brownhills junction** – The existing footway/cycle track crosses the existing A46 west of Brownhills roundabout from north to south through an existing underpass. This route provides a link between Newark-on-Trent and the village of Winthorpe via a second underpass beneath the A1, as well as forming part of the National Cycle Network Route 64 and the Trent Valley Way long distance walking route. The existing A1 and A46 underpasses would be retained as part of the Scheme, however the existing route between them would be impacted by the Scheme, requiring it to be diverted alongside the new junction link road that passes beneath the proposed dual carriageway and over the Brownhills northbound off-slip via a new signalised crossing to ensure continued connectivity. The Brownhills junction bridge would be wider than required to provide an open feel for walkers and cyclists.
- **Footway east of the A1** – There is an existing footway that runs alongside the south side of the existing A46 between Winthorpe and Friendly Farmer roundabouts. The route crosses the A46 in four locations via uncontrolled crossings across the existing dual carriageway which connect to provide a link between Newark-on-Trent and the Newark Showground. These crossings are considered unsafe, and they would not be retained as part of the Scheme. Instead, a new footway/cycleway link would be provided across the existing A46 between Friendly Farmer roundabout and the A1 crossing to link with the existing route that crosses the A1 slip roads and the A17. A new footway/cycleway link would be provided from the A17 crossing point through land to the south of the showground and alongside the south side of the new Friendly Farmer Link to Winthorpe roundabout and the first showground entrance on Drove Lane.
- **Footpaths FP2 and FP3** – Historically there was a PRoW that ran north to south between Winthorpe village and the Newark Showground. This has been severed by the existing A46 with FP2 ending at the northern boundary of the A46 and FP3 ending at the southern boundary. The Scheme would reconnect these two PRoWs via a new footway/cycleway that links with FP2 to the north and runs parallel to the proposed dual carriageway before crossing beneath it alongside the A1. On the south side of the new dual carriageway, it would cross the existing A46 via a new

signalised crossing and join the existing PRoW network that provides a connection with FP3. The ends of FP2 and FP3 will be permanently stopped up where they would result in a 'dead end'.

- **Footpaths/Cycle track at Winthorpe roundabout** – Currently there is no walking or cycling provision around Winthorpe roundabout. The Scheme proposes to address this by providing a new walking/cycling link between Hargon Lane and Drove Lane that passes around the north and east sides via new crossings over Winthorpe roundabout. This would provide a link between Winthorpe and the Newark Showground.

4.14.5 Effects on WCH as a result of the Scheme are assessed in Chapter 12 (Population and Human Health) of the ES [REP3-011]~~(**TR010065/APP/6.1**contained within Volume 6.1)~~ and information regarding the need for temporary diversions and closures of PRoW during construction of the Scheme is presented within the construction strategy contained in Section 2.6 of Chapter 12 (Population and Human Health) of the ES [REP3-011]~~(**TR010065/APP/6.1**contained within Volume 6.1)~~. The TA [APP-193] ~~(**TR010065/APP/7.4)**~~ also outlines the intended diversions and control measures on the WCH routes during construction.

4.14.6 A Walking, Cycling and Horse-riding Assessment and Review (WCHAR) has been undertaken to consider the impacts of the Scheme on walking, cycling and horse-riding facilities.

4.14.7 The purpose of the WCHAR process is to facilitate the inclusion of all WCH modes in the Scheme design from the earliest stage, enabling opportunities for new / improved facilities and their integration within the local and national networks.

4.14.8 A WCHAR was completed in June 2023 on the basis of the preliminary design and is available at Appendix C of the TA [APP-193]~~(**TR010065/APP/7.4**)~~. A further WCHAR would follow at the detailed design stage to ensure that the needs of WCH continue to be considered as the design progresses.

Public Transport

4.14.9 The Scheme is considered unlikely to affect rail stations or rail services.

4.14.10 The main impacts of the Scheme on local bus services are related to the potential temporary route diversions or suspensions during the construction phase. Once operational, the Scheme would not sever communities or adversely impact the existing bus service provision.

4.14.11 Overall, the impact of the Scheme's construction is expected to be minimal. The Principal Contractor will liaise with bus operators and NCC to determine if any measures are needed to maintain existing bus routes and to minimise the impact of construction on punctuality. There is a commitment to communicate with public transport providers in the Outline Traffic Management Plan [REP3-026]~~(**TR010065/APP/7.6**)~~.

4.14.12 Construction Impact Assessment

4.14.13 A construction impact assessment has been undertaken to understand the potential traffic impacts associated with the Scheme's construction phase, which is due to take place for four years between 2024 and 2028. This can be found in Chapter 8 (Construction Impact Assessment) of the TA [APP-193](~~TR010065/APP/7.4~~).

4.15 Construction phase traffic management

4.15.1 During construction, temporary traffic management (TTM) measures would be put in place to ensure that traffic associated with construction activity can be accommodated on both the strategic and local road network and to provide a safe working environment for staff.

4.15.2 Construction traffic management measures are presented in the Outline Traffic Management Plan (OTMP) [REP3-026](~~**TR010065/APP/7.6**~~). As the Scheme progresses through the detailed design phases, the OTMP would be developed into a Traffic Management Plan (TMP) by the Principal Contractor.

4.15.3 The Applicant will consult with the Local Highway Authorities to review and agree the detailed TTM. This is in line with Requirement 11 of the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~). Major local businesses and other stakeholders that are likely to be impacted by the traffic management would also be consulted during the development of the TMP.

4.15.4 Further details are set out in Chapter 8 (Construction Impact Assessment) of the TA [APP-193](~~**TR010065/APP/7.4**~~).

Model development

4.15.5 An operational model has been developed to assess the impact of construction activity associated with the Scheme on the strategic and local road network in 2028. The operational model for the construction assessment is based on the adaptation of the A46 operational model for 2028. Full details of the operational model development process can be found in Chapter 8 (Construction Impact Assessment) of the TA [APP-193](~~**TR010065/APP/7.4**~~).

4.16 Forecast network performance

Overarching network performance

4.16.1 Network performance statistics have been extracted from the operational model which show how the network is forecast to change as a result of construction activity associated with the Scheme. The results of the construction assessment are presented in

~~4.16.1~~ Table 4-17

4.16.2 ~~Table 4-17~~ below.

4.16.3 This analysis broadly indicates there is forecast to be a minimal increase in the number of vehicles on the network as a result of construction activity. However, given that the network is forecast to be heavily congested in the DM scenario, this relatively small increase in additional traffic is likely to further increase delay and congestion on the network. Whilst overall network performance is forecast to deteriorate as a result of construction activity, it should be emphasised that this would be for a relatively short period of time (up to six months) and is crucial for the delivery of the Scheme and the longer term benefits that it brings.

Table 4-17 Comparison of AM peak network performance in 2028 with and without construction activity

Measure	DM	DM + Construction	% Change
Average delay (s)	60	83	+38%
Average number of stops	3	6	+110%
Average network speed (mph)	40	36	-10%
Average stopped delay (s)	16	21	+35%
Total distance travelled (mi)	45,383	73,946	+63%
Total travel time (h)	1,125	1,266	+13%
Total delay (h)	216	305	+41%
Total number of stops	34,457	74,139	+115%
Total stopped delay (h)	57	78	+38%
Remaining vehicles in network	1,201	1,356	+13%
Processed vehicles	11,726	11,855	+1%
Latent demand delay (m)	28	41	+48%
Latent Demand (vehs)	1	0	-

Source: : Analysis of operational model

4.17 Journey times

4.17.1 Forecast journey times for the weekday AM peak have been extracted from the operational model to show how journey times are forecast to change across the Scheme extents as a result of construction activity associated with the Scheme.

4.17.2

~~4.17.1~~ **Table 4-18**

~~4.17.2~~

4.17.3 **~~Table 4-18~~** compares the journey times across the Scheme extents with and without the proposed construction activity.

4.17.4 This analysis broadly indicates that there are forecast to be relatively small increases in journey times on both the A46 and A617 in both

directions as result of construction activity associated with the Scheme.

Table 4-18: Comparison of AM peak journey times in 2028 with and without construction activity (hh:mm:ss)

	DM	DM + Construction	Change	% Change
A46 NB	00:12:57	00:13:39	00:00:42	+5%
A46 SB	00:13:06	00:15:34	00:02:28	+19%
A617 EB	00:08:39	00:09:41	00:01:02	+12%
A617 WB	00:08:44	00:10:42	00:01:59	+23%

Source: : Analysis of operational model

4.18 Junction performance

4.18.1 A summary of the construction modelling undertaken in this section is provided in Table 4-19~~Table 4-19~~. Detailed information relating to the performance of each junction can be found in the sections below.

4.18.2 This analysis indicates that there is forecast to be no material change in the performance of the Farndon, Brownhills, Friendly Farmer and Winthorpe roundabouts as a result of the proposed construction activity. There is forecast to be a small impact on performance of the Cattle Market roundabout as a result of the construction activity, however overall, this junction is not forecast to operate over capacity.

Table 4-19: Summary of Level of Service in 2028 AM peak construction assessments

Junction	Overall LoS		Summary of assessment
	DM	DM + Con	
Farndon	A	A	Junction operating well within capacity
Cattle Market	D	E	Junction forecast to operate at capacity
Brownhills	B	B	Junction operating well within capacity
Friendly Farmer	B	B	Junction operating well within capacity
Winthorpe	A	A	Junction operating well within capacity

Source: Analysis of operational model

4.18.3 As a result of the forecast construction activity, the Cattle Market junction is forecast to operate at capacity. It should be emphasised

that the junction would already be operating close to capacity in the DM scenario and that the construction period, the peak of which would last for a relatively short period of time (up to 6 months), is crucial for the delivery of the Scheme and the longer-term benefits that it brings.

5 Economic Case for the Scheme

5.1 Overview of economic assessment and methodology used

5.1.1 This chapter summarises the results of the economic assessment of the Scheme, which is used to demonstrate whether the Scheme is likely to represent value for money. The appraisal estimates the monetised benefits and disbenefits of the Scheme and compares them to the cost of the Scheme. This is presented in terms of a Benefit to Cost Ratio (BCR). Non-monetised benefits and disbenefits are also assessed and considered when determining the Scheme's overall value for money.

5.1.2 The economic appraisal of a highway scheme is an assessment of the net benefits to users and the wider community as a result of the Scheme, set against the capital construction and operating and maintenance costs, incurred over a 'whole life' period (60 years from Scheme opening). The economic appraisal of the Scheme has been prepared in accordance with the Green Book – Appraisal and Evaluation in Central Government, 2003 edition.

5.1.3 The economic appraisal compared the monetised costs and benefits of the Scheme (the DS) scenario against the alternative without the Scheme (the DM) scenario.

5.1.4 The costs of the Scheme comprised:

- The Scheme's capital costs.
- The additional operating costs of the new road and junctions.
- The net difference between the DM and DS forecast future maintenance capital costs.

5.1.5 The economic appraisal comprised four components:

- Economic benefits to road users, including time savings and vehicle operating costs.
- Economic disbenefits to road users associated with the delays during the construction of the Scheme.
- Accident savings and associated economic benefits.
- Monetised environmental benefits/disbenefits from changes to greenhouse gas emissions, local air quality and noise.

5.1.6 The benefits/disbenefits from these four components were combined and compared to costs to produce an initial BCR.

5.1.7 The following additional assessments were carried out and were included in the adjusted BCR:

- Wider economic impacts resulting from the Scheme. This was carried out using the Wider Impacts in Transport Appraisal (WITA) program which follows the principles and formula set out in the TAG Unit A2.1 guidance.
- Journey time reliability benefits. This comprised economic benefits as a result of more reliable journey times.

5.1.8 The two additional assessments provided the basis for deriving an adjusted BCR.

5.1.9 The standard approach is to evaluate the costs and benefits of the Scheme over a 60-year appraisal period from the year of opening. The assumed year of opening is 2028, with an intermediate model year of 2043, horizon year of 2061 and a final appraisal year of 2087.

5.2 Monetised benefits and disbenefits

Transport user benefits

5.2.1 The transport economic efficiency benefits arise from time and vehicle operating cost savings over the 60-year appraisal period and are evaluated from the difference in costs between the DM and the DS forecasts.

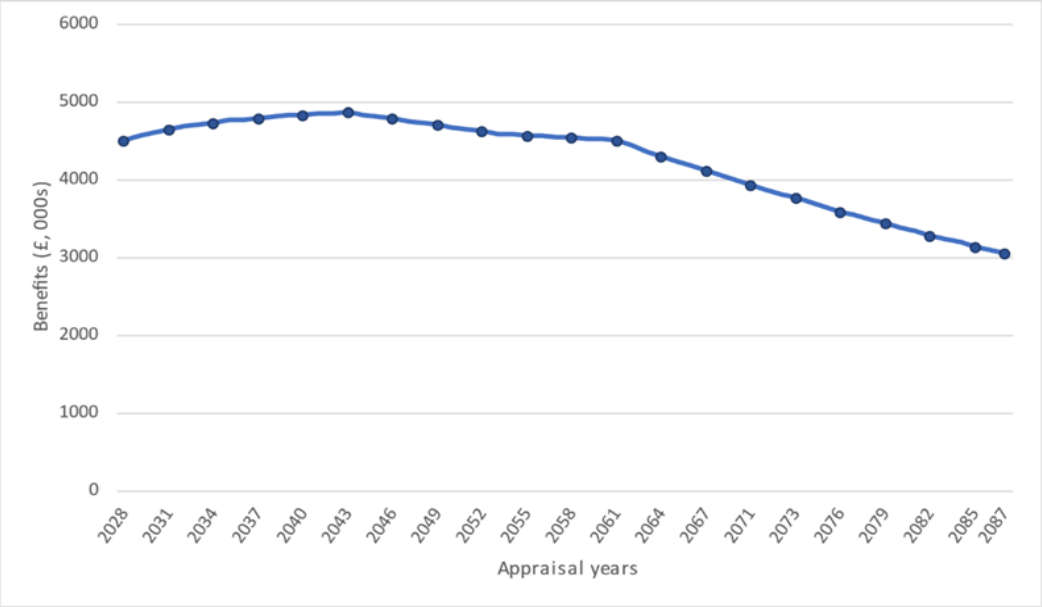
5.2.2 Table 5-1 shows the distribution of benefits by appraisal year for the modelled years.

Table 5-1 User benefits by modelled year (2010 princes discounted to 2010, Value £000)

Benefit measure	2028	2043	2061	Total (all years)	% Change 2028-2043	% Change 2043-2061
Travel time	4,227	4,866	4,407	250,837	15%	-9%
Vehicle operating costs (fuel)	166	96	94	5,398	-42%	-2%
Vehicle operating costs (non-fuel)	-103	-325	-59	-7,767	216%	-82%
Indirect taxes	217	225	61	7,081	4%	-73%
Total	4,507	4,862	4,503	255,549	8%	-7%

5.2.3 Figure 5-1 shows the total benefits for each year over the 60-year appraisal period.

Figure 5-1 User benefits (2010 prices discounted to 2010, Values £000)



5.2.4 The results show that annual benefits are fairly consistent between the opening year and horizon year despite the effects of discounting (discounting is the process of adjusting the figures in accordance with the TAG baseline of 2010. The effect of discounting is to give preference to present benefits over future benefits, this is in line with TAG guidance, specifically TAG Unit A1.1). There is a slight increase in annual benefit from Scheme opening in 2028 up to the 2043 intermediate year. Benefits gradually fall back between 2043 and 2061 but remain around the same level as at opening year. Beyond 2061 no further traffic growth is assumed and the level of annual benefit reduces in-line with discounting.

5.2.5 From opening year up to the horizon year, the Scheme is forecast to deliver significant benefits as the problems in the D-M scenario gradually worsen over time due to traffic growth, however, the increasing annual benefits of the Scheme are offset by the effects of discounting, which flattens the profile up to 2061.

5.2.6 In total, economic efficiency benefits are worth £248.5 million. These are split into the following types of journey purpose:

- Consumer users (commuting): £22.5 million.
- Consumer users (other): £50.4 million.
- Business users and providers: £175.6 million.

5.2.7 The Scheme would also lead to an increase in the tax revenues received by the Government over the appraisal timeframe, primarily due to an increase in fuel consumption as more vehicles move at a faster speed (based on traffic model predictions). DfT forecasts of electric vehicle uptake are included within these calculations. This gives a benefit of £7.1 million.

5.2.8 To quantify the impacts of Scheme construction on transport users, a Queues and Delays During Roadworks (QUADRO)-based economic assessment has been performed. The assessment evaluates the disbenefits due to roadworks during the construction stage of the Scheme improvements. The disbenefits are a result of roadworks causing delays to traffic, leading to impacts on travel times, vehicle operating costs, carbon emissions and accident costs. Table 5-2 provides a summary of QUADRO outputs. Values are expressed in 2010 prices, discounted to 2010. The values are presented as disbenefits, meaning that positive values represent costs.

Table 5-2 QUADRO Impacts (2010 prices discounted to 2010, £000s)

Consumer user benefits	**Disbenefit (£000s) (Figures have been rounded to the nearest £000)**
Travel time	5,567
Vehicle operating costs	110
Net consumer impact	**5,677**
Business user benefits	
Travel time	2,573
Vehicle operating costs	-210
Sub-total	2,363
Private sector provider impacts	
Operating costs	-17
Net business impact	**2,346**
Accident costs	15
Fuel carbon emission costs	1,695
Total non-exchequer impacts	**9,734**
Government funding	
Present value of costs	175
Overall impact	**9,909**

5.2.9 The costs of disruption due to the construction of the Scheme estimated by QUADRO amount to £9.9m. The impacts estimated by QUADRO are primarily a consequence of speed reductions implemented during construction, along with a smaller component of cost arising from several weekend and overnight closures on the A46 and A1.

5.2.10 The forecast number of accidents by severity over the 60-year appraisal period are presented in Table 5-3.

Table 5-3 Forecast accident impacts – by severity (60-year appraisal period)

Impact		Do-minimum	Do-something	Savings Due to Scheme
Accident costs (£m) (2010 prices discounted to 2010)		£8,191.4	£8,162.1	£29.3
Number of Personal Injury Accidents(PIAs)		191,688.0	191,194.5	493.5
Number of casualties	Fatal	2,983.4	2,974.8	8.6
	Serious	26,699.4	26,617.8	81.6
	Slight	240,327.6	239,733.3	594.3
	Total	270,010.4	269,325.9	684.5

5.2.11 Overall, the Scheme will provide safety benefits equivalent to £29.3m over the 60-year appraisal period; translated into 8.6 less fatalities, 81.6 less serious accidents and 594.3 less slight injuries. The overall impact is therefore positive, with a reduction in accidents and a reduction in casualties of all severities.

5.3 Forecast accident impacts – by COBALT element

5.3.1 Table 5-4 shows the forecast accident impact by network element. Noting that links and junctions are considered separately in the Area of Detailed Modelling and a combined link and junction assessment is carried out in the Rest of the Fully Modelled Area. As set out in TAG unit M3.1 (Highway Assignment Modelling) the Area of Detailed Modelling is the area over which significant impacts of interventions are certain whilst the Rest of the Fully Modelled Area is the area over which the impacts of interventions are considered to be quite likely but relatively weak in magnitude. Further details on the model coverage is set out in the COBALT assessment which can be found in Appendix A Combined Modelling and Appraisal (ComMA) of the TA [APP-193](~~**TR010065/APP/7.4**~~), and Figure 3-1 of the TA [APP-193](~~**TR010065/APP/7.4**~~) which shows the study area.

5.3.2 The combined figure in Table 5-4 below covers the Rest of the Fully Modelled Area. there will be an increase in PIAs but the benefits figure is still reported as a saving due to the impact of discounting.

Table 5-4 Forecast accident impacts – by COBALT element

COBALT Element	Number of PIAs saved (60-year appraisal period)	Benefits due to the Scheme (2010 prices, discounted to 2010, £m)
Links	**210.1**	**15.3**
Junctions	**338.7**	**10.1**
Combined	**-55.3**	**3.9**
Grand Total	493.5	29.3

5.3.3 Outputs from the COBALT assessment indicate that the Scheme is forecast to result in accident benefits for both the modelled links and junctions in the Area of Detailed Modelling and also, to a lesser extent, in the Rest of the Fully Modelled Area, where a combined assessment has been undertaken.

5.3.4 Link benefits arise from the upgrade of the single carriageway sections of the A46 to dual carriageway, and from some traffic reassigning onto the A46 from comparatively less safe local roads. COBALT junction benefits are largely attributable to the Scheme junctions, particularly those where grade separation is introduced. Other junctions that are relieved of traffic by the Scheme also contribute to an overall net benefit.

5.4 Reliability and network resilience impacts

5.4.1 The total reliability benefit for the 60-year appraisal period is presented in Table 5-5.

Table 5-5 Journey Time Reliability

	Period	Reliability Benefits (£000s)
Opening year 2028	AM	167.6
	Inter Peak (Average Hour 10:00 to 16:00)	482.2

	Period	Reliability Benefits (£000s)
	PM	89.1
Total (over 60-year appraisal period)		29,367.5

5.4.2 The outcome of the analysis is that the bulk of the journey time reliability benefits are at opening, with modest additional growth up to the intermediate year of 2043. The Scheme results in journey time reliability benefits of £29,367,537 over the 60-year appraisal period.

5.5 Environmental benefits

Noise

5.5.1 The results of the noise assessment are presented in Table 5-6.

Table 5-6 Noise assessment results

Measurement	Scheme
Net present value of change in noise	£5,106,488
Households experiencing increased daytime noise in Modelling forecast year (2043)	1398
Households experiencing reduced daytime noise in Modelling forecast year (2043)	1333
Households experiencing increased night-time noise in Modeling forecast year (2043)	550
Households experiencing reduced night-time noise in Modelling forecastyear (2043)	1208

5.5.2 The results indicate an overall benefit as a result of the Scheme due to decreases in road traffic on a number of links that make up the existing road network. There are 1398 properties in the daytime and 550 properties in the night-time that are predicted to be subject to increased noise in the forecast year. There are 1333 properties in the daytime and 1208 properties in the night-time that are predicted to be subject to reduced noise in the forecast year. Mitigation measures have been implemented along the alignment and within close

proximity to protect nearby residential properties from adverse noise effects due to the Scheme and the figures above reflect these mitigations.

5.5.3 Further information is also set out in Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**contained within Volume 6.1~~). Mitigation measures are set out in section 11.10 of Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**contained within Volume 6.1~~) and secured via the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~).

Air Quality

5.5.4 The results of the 'Damage Cost' assessment for the Scheme are presented in Table 5-7. The damage cost approach is the term from TAG Unit A3 to assess the value of impact per tonne of emission and the values below are taken from the Air Quality TAG Worksheet.

Table 5-7 Air quality assessment results

Measurement	Scheme
Change in Emissions – Nox t/year (2028)	6.31
Change in Emissions – PM2.5 t/year (2028)	0.92
Monetised environmental impact (2010 prices discounted to 2010)	-£1,747,031

5.5.5 The results indicate there is a net worsening in air quality as a result of the Scheme in the opening year and forecast year. The worsening is primarily due to an increase in annual traffic movements due to increased capacity delivered by the Scheme, and an overall increase in vehicle kilometres travelled.

5.5.6 The Scheme would result in the monetary disbenefit of -£1,747,031.

5.5.7 It should be noted that the results of the detailed air quality assessment set out in Chapter 5 (Air Quality) of the ES [AS-021](~~**TR010065/APP/6.1**contained within Volume 6.1~~) demonstrate that the Scheme does not affect legal compliance with air quality limits, and it has a positive effect on air quality within Newark-on-Trent.

Greenhouse Gases

The results of the assessment are summarised in Table 5-8.

Table 5-8 Greenhouse Gas assessment results

Measurement	Scheme
Greenhouse Gas (GHG) emissions (tCO_2e)	683,200
Total Value of emissions over 60 years (in £000s) (2010 prices discounted to 2010)	-£56,416

5.5.8 The Scheme would result in increased GHG emissions due to the construction and the operation of the Scheme. The sum of emissions from all sources equals 683,200tCO_2e. This includes emissions from construction, operational energy, renewal and maintenance, land use change (impacts through changes to habitat and the level of carbon sequestration pre and post Scheme) and road user emissions. Road user emissions is the largest category as there would be a net increase of vehicle kilometres travelled over the study area and as such a total increase of 523,019 tCO_2e over the 60-year assessment period.

5.5.9 Construction is responsible for approximately 143,887tCO_2e, which is the sum of the embodied GHG emissions within materials, construction plant and transport of materials to site. The renewal and maintenance emissions accounts for 15,416 tCO_2e. The operational energy and land use change emissions are responsible for 878 tCO_2e over the 60-year assessment period.

5.5.10 To provide context on the level of emissions, the assessment as presented in Chapter 14 (Climate) of the ES [APP-058]~~(**TR010065/APP/6.1**contained within Volume 6.1)~~, provides a comparison of the emissions against the UK Government Carbon Budgets. This is the methodology for assessing the significance as outlined in DMRB LA114. The assessment determines that the emissions contribute less than 0.007% to any of the relevant carbon budgets. As this is a small proportion of the budgets, the Scheme is not likely to materially impact the UK Government in reaching its targets.

5.6 Wider economic benefits

5.6.1 The Scheme would also lead to wider economic improvements. An assessment has been made regarding the wider economic impacts of the Scheme, undertaken using the DfT's Wider Impacts in Transport Appraisal (WITA) software.

5.6.2 The following wider economic impacts have been included in the appraisal undertaken:

- Agglomeration benefits – These arise from benefits arising relating to economic density and business productivity.
- Increase in output in markets with imperfect competition – In markets which are dominated by a few suppliers, prices may be above the quantity which would occur in competitive markets.
- Labour supply impacts – The calculations use the change in generalised cost for a commuting round trip to calculate the change in employment, the resulting increment in GDP and the resulting increase in taxation paid.

5.6.3 Table 5-9 presents the wider economic impacts for the Scheme. Agglomeration impacts account for approximately 73% of the total

wider economic impacts, with increased outputs in imperfectly competitive markets accounting for the majority of the other benefits.

Table 5-9 Estimated wider economic benefits (2010 prices discounted to 2010, £000)

Wider impact	Benefits due to Scheme (£000s)
Agglomeration – manufacturing	2,157
Agglomeration – construction	3,370
Agglomeration – consumer services	16,610
Agglomeration – producer services	27,340
Agglomeration – Total	**49,477**
Labour supply impact	433
Increased output in imperfect competitive market	17,557
Total Wider Economic Impacts	**67,467**

5.6.4 In terms of the key wider impacts, agglomeration impacts account for approximately 73% of the total wider economic impacts. This is in line with the improved connectivity and opening up of new economic opportunities that the Scheme is likely to bring.

5.6.5 The bulk of the remaining benefits relate to increased output, with labour supply impacts being relatively minor. This is also largely a reflection of the improved connectivity the Scheme seeks to achieve.

5.6.6 These wider impacts would provide overall benefits of £67,467million.

5.7 Non-monetised benefits

Environmental

5.7.1 A seven-point (7-pt) Likert scale ranging through ‘slight’, ‘moderate’ and ‘large’ adverse/beneficial impacts, alongside ‘neutral’ impact has been utilised to cover the qualitative environmental assessments for landscape, townscape, historic environment, biodiversity and water environment impacts. From the Business Case assessment perspective this is the same terminology used for the EIA, see Chapter 4 (Environmental Assessment M~~m~~ethodology) of the ES (~~**TR010065/APP6.1**~~)[APP-04]. The results of the Environmental qualitative assessment are based on the assessments set out in the ES (~~**TR010065/APP6.1**~~contained within Volume 6.1). Table 5-10 and Table 5-11 provide a summary of these impacts.

Table 5-10 Qualitative environmental impacts

Impact	Qualitative assessment	Justification
Landscape	Slight adverse	Elevated sections of the route and extent of new highways infrastructure, particularly at Cattle Market and Brownhills roundabouts, would have a localised impact on views and landscape character. Mitigation measures, such as the reintroduction of hedgerows, grassland and wetlands on what was previously farmland, will reduce overall landscape impact along the mainline.
Townscape	Slight adverse	No overall noticeable changes to townscape character but there would be localised changes resulting from alterations to access arrangements for public rights of way that cross the A46. The presence of new elevated structures at Cattle Market and Brownhills would slightly alter the adjacent townscape.
Historic Environment	Moderate adverse	Permanent impacts to the historic environment would occur during construction. This includes the removal of archaeological and historical remains, in addition to the partial demolishment of the Grade II listed Causeway Arches, which will be demolished and subsequently rebuilt in an appropriate and sensitive manner and materials, the details of which will be subject to further consultation with

Impact	Qualitative assessment	Justification
		stakeholders. For more detail see Chapter 6 (Cultural heritage) of the ES (~~**TR010065/APP/6.1**~~~~contained within Volume 6.1)~~[APP-050].
Biodiversity	Moderate adverse	A range of slight adverse to moderate adverse biodiversity impacts are expected on several conservation areas, such as the Humber Estuary, and along grasslands and woodlands in proximity to the Scheme. This will result in habitat loss which would need to be mitigated in order to achieve a net gain outcome. Affected species include bats, breeding and wintering birds, barn owls, amphibians, badgers, water voles, brown hares, hedgehogs, aquatic and terrestrial invertebrates and fish.
Water Environment	Neutral	No net impact as the Scheme would result in a combination effect of positive and negative impacts. The inclusion of swales within the Scheme design will reduce impact on the floodplain and also provide some water cleansing within attenuation areas.

5.7.2 The overall assessment, apart from the impact on the water environment, shows a level of adverse impacts.

Table 5-11 Qualitative social impacts

Impact	Qualitative assessment	Justification
Physical activity	Slight beneficial	Improvement of public rights of way (PRoW) within Scheme limits will improve overall access and safety across the A46. Enhancement of these routes and of A46 junctions may encourage an uptake in active travel and result in an increase in physical activity.
Journey Quality	Moderate beneficial	The Scheme has the potential to reduce driver stress and frustration by reducing time spent stuck in congested conditions. Any benefits to journey quality will also support future economic aspiration due to the proximity of allocated employment land, therefore meeting the needs of a growing population in the area.
Security	Neutral	Existing security and safety infrastructure (lighting, CCTV cameras, laybys and emergency telephones) will be maintained or replaced. There is not anticipated to be any considerable impact on security.
Severance	Slight beneficial	The Scheme is likely to make pedestrian and cycle journeys more attractive, reducing traffic flows on local roads which would result in reduced local severance.

5.7.3 Overall, the Scheme is anticipated to have beneficial or neutral benefits in terms of social impacts.

5.8 Value for money

5.8.1 The Transport Economic Efficiency (TEE) assesses the contribution of a transport option on economic welfare through the consideration of the resultant transport costs and benefits. The TEE and public accounts information are combined and produce an overall Value for Money (VfM) assessment. This is presented in the Analysis of Monetised Costs and Benefits (AMCB) table which is presented in Table 5-12.

Table 5-12 Analysis of monetised costs and benefits

Appraisal Element	Value (£,000)
Economic Efficiency: Consumer Users (Commuting)	22,536
Economic Efficiency: Consumer Users (Other)	50,366
Economic Efficiency: Business Users and Providers	175,566
Wider Public Finances (Indirect Taxation Revenues)	7,081
Accident Reduction Impacts	29,296
Construction Impacts	-9,909
Air Quality Impacts	-1,747
Noise Impacts	5,106
Greenhouse Gases Impacts	-56,416
Present Value of Benefits (PVB)	221,879
Broad Transport Budget Present Value of Costs (PVC)	266,037
Initial Benefit to Cost Ratio (BCR)	0.83
Reliability Benefits	29,368
Wider Impacts	67,467
Adjusted PVB	318,714
Adjusted BCR	1.20

5.8.2 The initial BCR for the Scheme is 0.83. The inclusion of the wider impacts and reliability benefits gives an adjusted BCR of 1.20.

5.9 Summary of assessments

5.9.1 The economic appraisal has sought to assess the full range of economic, environmental, social benefits and impacts resulting from the Scheme, in line with TAG. Costs and benefits have been quantified, or 'monetised' as part of a cost benefit analysis, wherever possible.

5.9.2 The Scheme demonstrates a significant number of benefits, building upon previous improvements to the A46 between Nottingham and

Lincoln and contributing to wider economic benefits along the wider A46 corridor. These include:

- Large level of user benefits of £248.5m over a 60-year appraisal period, of which the bulk are travel time savings as well as reduction in vehicle operating costs.
- Journey time reliability benefits of approximately £29.4m over the same period as well as accident savings of £29.3m over the same period
- In terms of wider economic benefits, the Scheme is likely to result in a £67.5m gain, with agglomeration improvements arising from improved connectivity.

5.9.3 In terms of non-monetised impacts, the Scheme will provide:

- Benefits in terms of changes to physical activity, journey quality, severance
- Disbenefits (ranging from slight adverse to moderate adverse) for landscape, townscape, historic environment and biodiversity.

5.9.4 As a result, the Value for Money statement places the Scheme as having low value for money with a BCR of 0.83 and an adjusted BCR of 1.20.

5.9.5 This has to be seen in the context of the level of works and structures associated with this Scheme, which are complex compared to the neighbouring stretches of the A46, which were largely dual carriageway over relatively unchallenging landscape.

5.9.6 In line with DfT guidance, common analytical scenarios of high economy and low economy have been applied. These result in changes to the BCR of 1.37 (adjusted 1.76) for high economy and 0.57 (adjusted 0.92) for low economy.

5.9.7 Freight sensitivity testing has been applied to account for the importance of the A46 route as a strategic freight corridor. These include high and low scenarios for increased values in freight travel time saving benefits associated with the Scheme.

6 Conformity with Planning Policy and Transport Plans

6.1 Overview

6.1.1 This Chapter provides an appraisal of the Scheme's conformity with the relevant national policies that will guide the decision processes and outlines how the Applicant is assessing the Scheme against key policies, local and national.

6.1.2 Local Plans and other national policy documents, such as the NPPF (2023), can be a relevant consideration when making decisions on DCO applications. Section 104(2) of the 2008 Act states that the relevant Secretary of State must have regard to the relevant NPS, any local impact reports produced by host authorities, prescribed matters, and any other matters that they consider are both important and relevant to the decision.

6.2 National planning and Government's transport policy

6.2.1 Various national-level documents offer relevant information, as well as fundamental consideration with which the Scheme has been assessed against. The national-level documents considered to be relevant to the Scheme include:

- National Policy Statement for National Networks (December 2014).
- National Planning Policy Framework (September 2023)[14].
- Road Investment Strategy 1 2015 – 2020 (December 2014)[15].
- Road Investment Strategy 2 2020 – 2025 (March 2020)[16].
- National Infrastructure Delivery Plan 2016 – 2021 (March 2016)[17].
- The Strategic Road Network and the Delivery of Sustainable Development (DfT Circular 01/2022)[18].

[14] Ministry of Housing, Communities, and Local Government. (2023). National Planning Policy Framework. [Online]. Available at: National Planning Policy Framework (publishing.service.gov.uk). (Accessed December 2023).

[15] Department for Transport. (2015). Road Investment Strategy: For the 2015/16 – 2019/20 Road Period. [Online]. Available at: Road Investment Strategy: for the 2015/16 – 2019/20 Road Period (publishing.service.gov.uk). (Accessed June 2022).

[16] Department for Transport. (2020). Road Investment Strategy 2 2020 – 2025 [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951100/road-investment-strategy-2-2020-2025.pdf. (Accessed November 2022).

[17] Infrastructure and Project Authority. (2016). National Infrastructure Delivery Plan 2016 – 2021. [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/520086/2904569_nidp_deliveryplan.pdf. (Accessed November 2022).

[18] DfT and National Highways. (2022). Strategic Road Network and the Delivery of Sustainable Development. [Online] Available at: Strategic road network and the delivery of sustainable development - GOV.UK (www.gov.uk) (Accessed June 2023)

- Highways England (now National Highways) Delivery Plan and Strategic Business Plans.

6.2.2 In 2019 the Government outlined its commitment to reach net zero emissions by 2050. Various national-level documents offer relevant information surrounding this target, including specific documents surrounding transport. The national-level documents considered to be relevant to the Scheme include:

- Net Zero Strategy: Build Back Greener (April 2022)[19].
- Carbon Reduction Policy (February 2023)[20].
- Decarbonising Transport: A Better, Greener Britain (January 2023)[21].
- DfT Outcome Delivery Plan: 2021 to 2022 (July 2021)[22].

6.2.3 This section then sets out an appraisal of the Scheme against planning policy summarised by key topic.

6.3 National Policy Statement for National Networks

6.3.1 NPSs (National Policy Statements) are produced by the Government. As explained on the Inspectorate's National Infrastructure Planning website*, "they give reasons for the policy set out in the statement and must include an explanation of how the policy takes account of Government policy relating to the mitigation of, and adaptation to, climate change. They comprise the government's objectives for the development of nationally significant infrastructure in a particular sector and state."*

6.3.2 NPSs also include any other policies or circumstances that ministers consider should be taken into account in decisions on infrastructure development.

6.3.3 There are 12 designated NPSs setting out Government policy on distinct types of national infrastructure development. The NPSNN (DfT, 2014) is the primary national policy document that guides decision making on this application covering both the road and rail network.

6.3.4 The NPSNN sets out "the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England," as well as

[19] HM Government. (2022). Net Zero Strategy: Build Back Greener. [Online] Available at: net-zero-strategy-beis.pdf (publishing.service.gov.uk). (Accessed June 2023).

[20] CCS. (2022). Carbon Reduction Policy. [Online]. Available at: Carbon Reduction Policy - GOV.UK (www.gov.uk). (Accessed June 2023).

[21] DfT. (2021). Decarbonising Transport: A Better, Greener Britain. [Online]. Available at: Decarbonising Transport – A Better, Greener Britain (publishing.service.gov.uk). (Accessed June 2023).

[22] DfT. (2021). DfT Outcome Delivery Plan: 2021 to 2022. [Online]. Available at: DfT Outcome Delivery Plan: 2021 to 2022 - GOV.UK (www.gov.uk).(Accessed November 2022).

providing *"planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State."*

6.3.5 The intent of the NPSNN is to remain consistent with the NPPF throughout. Nevertheless, whereas the NPPF makes clear it is not intended to contain specific policies for NSIPs, the NPSNN *"will assume that function and provide transport policy which will guide individual development brought under it."*

6.3.6 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 before being published in its designated form. Although this is currently in draft it is still a material consideration for the Secretary of State when determining whether to grant consent for the DCO for this Scheme, accordingly the Draft NPSNN Accordance Tables ~~([TR010065/APP/7.3~~APP-192~~])~~ summarise the compliance of the Scheme with the draft NPSNN.

6.3.7 This section provides an appraisal of the Scheme's strategic alignment and conformity with the relevant national planning policies within the NPSNN. The appraisal within this section focuses on the key policy matters relevant to the Scheme and purposefully does not seek to set out how the Scheme performs against all policies within the NPSNN. A detailed appraisal of how the Scheme at this stage conforms with all policies within the NPSNN is contained within the NPSNN Accordance Tables ~~(TR010065/APP/7.2)~~[AS-090].

6.4 National Planning Policy Framework

6.4.1 Local Plans and other documents, such as the NPPF (2023), can be a relevant consideration when making decisions on DCO applications. Section 104(2) of the Planning Act 2008 states that the relevant Secretary of State must have regard to the relevant NPS, any local impact reports produced by host authorities, prescribed matters and any other matters that they consider are both important and relevant to the decision. The compliance of the Scheme with the relevant policies of the Local Development Plans, and emerging Development Plan Policies is summarised in Section 6.15 of this Case for the Scheme.

6.4.2 The NPPF sets out the Government's national planning policies for England and how these should be applied strategically in the development plan system and in the management of development.

6.4.3 The NPPF states that NPSs are the primary decision-making document for NSIPs under the 2008 Act. Paragraph 5 of the NPPF states *"The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as*

amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework)."

6.4.4 The NPPF sets out "*the Government's planning policies for England and how these should be applied," as well as providing "a framework within which locally prepared plans can provide for sufficient housing and other development in a sustainable manner."* The NPPF reiterates the serious need for Planning to consider the economic, social, as well as environmental elements of a scheme to secure sustainable development. Likewise, the NPPF establishes a *"presumption in favour of sustainable development."*

6.5 Road Investment Strategy 1: 2015/16-2019/20

6.5.1 In December 2014, DfT published the first Road Investment Strategy (RIS1) covering the period 2015-2020. RIS1 set out the list of schemes to be developed by the Applicant over the period covered by RIS1.

6.5.2 Within the RIS1 the Scheme was announced as a scheme to be developed for the next "Road Period", involving the "widening of the A46 north of Newark-on-Trent to dual carriageway, raising the last section of the A46 between the A1 and M1 to Expressway standard. Improvement of the A46/A1 junction to allow for better traffic movement to Newark and Lincoln" (page 40).

6.6 Road Investment Strategy 2: 2020–2025

6.6.1 In March 2020, the Government published RIS2 covering the period 2020-2025. RIS2 outlines the long-term strategic vision for the SRN, and again reaffirmed the Government's commitment to improvements at the A46 in Newark. The Scheme is a committed scheme in RIS2 on page 98*: "A46 Newark–Bypass – improve the capacity of the single carriageway and junctions of the A46 at Newark and provide better links to the A1."*

6.6.2 RIS2 also summarised that "Midlands Connect has highlighted the role of the A46 in connecting the Midlands, running from Lincoln to Gloucestershire via Leicester and Coventry. Much of this road is already high-quality dual carriageway, and by filling in key sections it would be possible to create a coast-to-coast highway without the need for major new road-building across open countryside. The single greatest gap in this route is the A46 at Newark".

6.7 National Infrastructure Delivery Plan

6.7.1 The National Infrastructure Delivery Plan (NIDP) 2016–2021 replaced the previous National Infrastructure Plan 2014 (NIP 14). The NIDP 2016–2021 outlined the detail of £483 billion of investment in over 600 infrastructure schemes and programmes in all sectors and spread across the UK until 2020–21.

6.7.2 The NIDP 2016–2021 provides a forward look at investment plans, as well as sets out how the Government is investing £15 billion to support Highways England (now National Highways) in transforming the SRN with over 100 major schemes completed or in construction by the end of 2020-21, including the A14, A1, A303 and the A46 Newark Bypass (see paragraph 6.126).

6.7.3 The NIDP 2016–2021 also established a series of objectives for National Highways to follow. With relevance to the Scheme, these included but were not limited to:

- Making the network safer: with a target of 40% reduction in the number of people killed or seriously injured on the SRN against the 2005-09 period by the end of 2020.
- Improving user satisfaction: by 31 March 2017, 90% of people responding to the National Road Users' Satisfaction Survey need to be either fairly or very satisfied.
- Supporting the smooth flow of traffic: minimise delay and inconvenience to road users and ensuring at least 97% of the SRN is available to road users and ensuring at least 85% of incidents are cleared within 1 hour.
- Encouraging economic growth by working to minimise delay on the SRN.
- Achieving real efficiency: delivering total capital savings of at least £1.2 billion by the end of the Road Period 1.
- Keeping the SRN in good condition; including an ambitious resurfacing programme.

6.7.4 The NIDP 2016–2021 identified the need for improvement to the A46 Newark Bypass junction with the A1, stating that the Government would conduct feasibility work for the Scheme.

6.7.5 Published in November 2020, the "National Infrastructure Strategy: Faster, fairer, greener" set out the Government's plans for investment in infrastructure, making reference to the Scheme, as shown below:

- *"The government will make the largest ever investment in England's strategic roads - £27.5 billion over this Parliament, a 60% increase on spending in the last five years. This major investment will ensure that these national traffic corridors are well designed, delivered, maintained, and continue to serve all road users into the future."*
- *"New upgrades will include: dualling the A66 between Penrith and Scotch Corner and halving the construction time as part of Project Speed; upgrading the A46 Newark bypass in the East Midlands;*

building a new Lower Thames Crossing; and building a two-mile tunnel on the A303 at Stonehenge to speed up journeys and enhance the World Heritage Site.".

6.8 The Strategic Road Network and the Delivery of Sustainable Development (DfT Circular 01/2022)

6.8.1 This Circular explains how National Highways will engage with the planning system and fulfill its remit to be a delivery partner for sustainable economic growth whilst maintaining, managing and operating a safe and efficient SRN.

6.8.2 It states that National Highways will work with local authorities to influence Local Plan decisions that may effect the SRN.

6.9 Highways England Delivery Plan and Strategic Business Plans

6.9.1 The Highways England (now National Highways) Delivery Plan published in March 2015 (2015-2020) identified the A1/A46 junctions and the A46/A616/A617 (Cattle Market roundabout) as schemes for development and delivery in the next Road Period.

6.9.2 The scope of the Scheme includes both junctions set out in the Delivery Plan. This commitment was reaffirmed in the Highways England Delivery Plan 2020 to 2025, providing a start of works commitment of the 2024/25 financial year.

6.10 Government Net Zero Strategy: Build Back Greener

6.10.1 The Government Net Zero Strategy: Build Back Greener (GNZS) published in October 2021 and updated in April 2022 details the Government measures to reach carbon net zero by 2050. Within the GNZS, the Government outlines four core foundations to enable the transition to carbon net zero. The Government will:

- Work with the grain of consumer choice: no one will be required to rip out their existing boiler or scrap their current car.
- Ensure the biggest polluters pay the most for the transition through fair carbon pricing.
- Ensure that the most vulnerable are protected through Government support in the form of energy bill discounts, energy efficiency upgrades, and more.
- Work with businesses to continue delivering deep cost reductions in low carbon tech through support for the latest state of the art kit to bring down costs for consumers and deliver benefits for businesses.

6.10.2 Whilst transition to carbon net zero will extend across several decades, the GNZS identified several policies, as well as schemes to monitor the transition to carbon net zero.

6.10.3 In accordance with the DMRB LA 114 Climate guidance document, the Applicant has sought to reduce carbon emissions as far as possible in order to contribute to the UK's net reduction in carbon emissions. The Scheme has a carbon reduction target set, in line with National Highways Carbon Management System, to be achieved from the baseline assessment to the completed Scheme. This target is for 35% reduction, at this stage 33% has already been achieved and through further optimisation and construction related measures it is anticipated this will be achieved.

6.10.4 A hierarchical approach to carbon management has been applied, which applies the principles of build nothing, build less, build clever, build efficiently (as described in PAS 2080: Carbon Management in Infrastructure). Using the hierarchy and data driven decision making it has been possible to drive carbon reduction through the design. Key carbon reductions identified are detailed in Chapter 14 (Climate) of the ES ~~(TR010065/APP/6.1)~~[APP-058] including:

- Reduction in earthwork balancing driving considerable reductions in excavation, import of fill, deposition and compaction
- Reduction of emissions through optimisation of the pavement design and proposal for efficient construction techniques to improve longevity of the design and reduce maintenance
- Specification of low carbon materials where applicable

6.10.5 Chapter 14 (Climate) of the ES [APP-058]~~(**TR010065/APP/6.1**)~~ concludes that the construction and operation of the Scheme will result in an increase in greenhouse gas (GHG) emissions, however, the contributions of the Scheme to the UK's carbon budget for the relevant carbon budget periods are less than 0.007%, and the assessment concludes no significant effect and that the GHG emissions impact of the Scheme would not have a material impact on the UK government meeting its legally binding carbon reduction targets.

6.10.6 The Scheme has been designed to ensure the lifetime operation is as efficient as possible ensuring a whole-life low carbon scheme supporting the Applicant's ambitions.

6.11 Carbon Reduction Policy

6.11.1 The Crown Commercial Service (CCS), the biggest public procurement organisation in the UK, remains committed to the achievement of net zero emissions by 2050, which would in turn represent a substantial benefit to the CCS, as well as their consumers, suppliers, and the wider communities.

6.11.2 The CCS's Carbon Reduction Plan (CRP) focuses on the processes that the CCS will follow to oversee its commitment to net zero emissions, as well as reduce its business-related carbon emissions. The CRP utilises the CCS's baseline information to establish a clear target for their GHG emission reduction across the planned timeframe. The CRP specifies the CCS's planned schemes to reach carbon net zero by 2050.

6.11.3 From 2019 to 2035, the CCS intends to reduce its GHG emissions from 829.791 tonnes to around 180 tonnes, which would mean a reduction of 78%. The CSS has identified several means to reach this, as well as the carbon net zero aim to 2050.

6.11.4 In accordance with the DMRB LA 114 Climate guidance document, the Applicant has sought to minimise carbon emissions as far as possible in order to contribute to the UK's net reduction in carbon emissions. Through the Scheme design significant efforts to reduce emissions have occurred, resulting in a 44% reduction in carbon emissions compared to the baseline design. The baseline design is that which was reported in the Preliminary Environmental Information Report, based on the preferred route announcement design.

6.12 Decarbonising Transport: A Better, Greener Britain (Transport Decarbonisation Plan)

6.12.1 The Transport Decarbonisation Plan (TDP) outlines the course which the DfT surmises will secure carbon net zero within travel across the UK, as well as the various benefits associated with carbon net zero travel. The TDP details several foundations that will be the basis of the DfT's plan. The DfT's TDP also summarises its commitment to decarbonise transport.

6.12.2 To reach the decarbonisation commitment of net zero emissions from 2050, as well as its vision (clean transport is better transport), the DfT identifies various priorities:

- Accelerating modal shift to public and active transport.
- Decarbonisation of road vehicles.
- Decarbonising how it get its goods.
- Place-based solutions.
- UK as a hub for green transport, technology, and innovation.
- Reducing carbon in a global economy.

6.12.3 With focus on multi-modal decarbonisation, as well as the decarbonisation of each form of travel, the TDP discloses the DfT's commitments in detail. In particular, the TDP states that the DfT:

- Will invest £15 million in 2021/22 to help address the backlog in traffic signal maintenance to improve traffic flow and reduce emissions.
- Will review the National Networks National Policy Statement.

6.12.4 Please refer to paragraph 6.11.4 above which shows compliance with the Transport Decarbonisation Plan.

6.13 DfT Outcome Delivery Plan: 2021 to 2022

6.13.1 The DfT remains committed to the delivery of its outcomes, which the DfT confirmed within its Outcome Delivery Plan: 2021 to 2022 (ODP) published in July 2021. The ODP identifies several outcomes:

- Improving connectivity across the UK and growing the economy by enhancing the transport network, on time and on budget.
- Building confidence in the transport network as the country recovers from COVID-19 and improving transport users' experience, ensuring that the network is safe, reliable, and inclusive.
- Tackling climate change and improving air quality by decarbonising transport.

6.13.2 The ODP clarifies how the DfT will achieve the various outcomes, as well as how the resources will be allocated to reach each outcome.

6.13.3 Although the ODP recognises the importance of decarbonisation, as well as clear air, it also outlines the need to enhance infrastructure. The ODP will function in tandem with the DfT's Decarbonising Transport: A Better, Greener Britain to ensure the DfT's schemes will be sustainable, and that infrastructure will be resilient to climate change.

6.13.4 The TA [APP-193](~~**TR010065/APP/7.4**~~) demonstrates the Scheme is expected to increase capacity and reduce congestion on the SRN, resulting in a reduction in journey times and an increase in long distance traffic on the A46.

6.13.5 Chapter 14 (Climate) of the ES [APP-058](~~**TR010065/APP/6.1**contained within Volume 6.1~~) concludes that the construction and operation of the Scheme would result in an increase in GHG emissions, however, the contributions of the Scheme to the UK's carbon budget for the relevant carbon budget periods are less than 0.007%, and the assessment concludes no significant effect and that the GHG emissions impact of the Scheme would not have a material impact on the UK government meeting its legally binding carbon reduction targets.

6.13.6 Chapter 2 (The Scheme) of the ES [APP-046](~~**TR010065/APP/6.1**contained within Volume 6.1~~) outlines embedded mitigation measures incorporated into the Scheme design, including using low carbon concrete kerbs, drainage outfalls and drainage chambers to help reduce carbon.

6.14 Policy Appraisal Summary by Key Topics

6.14.1 The following section provides an appraisal of the Scheme against planning policy and is organised by key topics.

Principal of development

6.14.2 The NPSNN provides the Government's overarching support for NSIPs which contribute towards improvements to the SRN, such as those that the Scheme has been designed to deliver.

6.14.3 NPSNN paragraph 2.2 states that: *"There is a critical need to improve the national networks to address road congestion and crowding on the railways to provide safe, expeditious and resilient networks that better support social and economic activity; and to provide a transport network that is capable of stimulating and supporting economic growth. Improvements may also be required to address the impact of the national networks on quality of life and environmental factors."*

6.14.4 The NPSNN (page 9) sets out a summary of the Government's vision and strategic objectives for the national networks. It states: *"The Government will deliver national networks that meet the country's long-term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system."*

6.14.5 Table 6-1 provides an appraisal of the contribution of the Scheme towards these objectives.

Table 6-1 NPSNN Objectives and the Scheme

NPSNN vision and strategic objectives (page 9 of the NPSNN)	Conformity of the Scheme
The Government will deliver national networks that meet the country's long term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system.	The stretch of A46 between the Farndon junction, to the west of Newark-on-Trent and the A1 to the east of Newark-on-Trent, is the last remaining stretch of single carriageway between the M1 and A1 and consequently there are congestion issues, which impact journey time reliability. As set out in the Scheme objectives in Chapter 3 of this Case for the Scheme, the Scheme has been designed to reduce congestion and improve journey time and reliability on the A46, promote economic growth in

NPSNN vision and strategic objectives (page 9 of the NPSNN)	Conformity of the Scheme
	Newark-on-Trent and the wider area and improve safety by reducing collisions.
Networks with the capacity, connectivity and resilience to support national and local economic activity and facilitate growth and create jobs.	Congestion on the A46 is identified nationally and locally as a barrier to growth. As set out in Chapter 4 of this Case for the Scheme, the Scheme would increase the resilience of the highway network by increasing the capacity of the SRN, reducing congestion and improving journey time reliability. Significant housing and employment growth is identified within the local development plan, including 4,735 homes and 83.1 ha of employment land. The Newark & Sherwood IDP outlines that the Scheme is a key condition to unlocking this growth in Newark-On-Trent. This is further set out in in Chapter 3 of this Case for the Scheme. The Scheme would also contribute towards local economic growth during construction through the utilisation of the local labour force.
Networks which support and improve journey quality, reliability and safety.	The TA [APP-193]~~(TR010065/APP/7.4)~~ forecasts that the Scheme would result in an increased capacity and reduction in congestion on the SRN, as demonstrated in Chapter 4 of this Case for the Scheme. This would improve journey time and reliability. The Scheme would also improve. How the Scheme achieves this is also set out in Chapter 3 and 4 of this Case for the Scheme.
Networks which support the delivery of environmental goals and the move to a low carbon economy.	The relevant environmental targets are presented in the NPSNN Accordance Table. [AS-090]~~(TR010065/APP/7.2)~~. The Scheme will achieve a net gain in habitat units within the Order Limits of

NPSNN vision and strategic objectives (page 9 of the NPSNN)	Conformity of the Scheme
	the Scheme with the exception of the areas of impact and compensation for lowland meadow. Further information is contained within Appendix 8.14 (Biodiversity Net Gain Technical Report) of the Environmental Statement Appendices [APP-159]~~(TR010065/APP/6.3)~~. This is above and beyond the requirements of the NPSNN which sets out that schemes should not result in net loss of biodiversity.
Networks which join up our communities and link effectively to each other.	The TA [APP-193]~~(TR010065/APP/7.4)~~ forecasts that the Scheme would reduce congestion and cut journey times, linking communities by road. The Scheme would also provide improvements to WCH routes affected by the Scheme and seek to improve facilities where practical. For example, historically there was a PRoW that ran north to south between Winthorpe and the Newark Showground. This is severed by the existing A46 with FP2 ending at the northern boundary of the A46 and FP3 ending at the southern boundary. The Scheme would reconnect these two PRoWs via a new footway/cycleway that links with FP2 to the north and runs parallel to the new dual carriageway before crossing beneath it alongside the A1. On the south side of the new dual carriageway, it will cross the existing A46 via a new signalised crossing and join the existing PRoW network that provides a connection with FP3. The Scheme would help in improving connectivity between communities.

6.14.6 Paragraph 2.4 of the NPSNN states*: "The pressure on our networks is expected to increase even further as the long term drivers for demand to travel – GDP and population – are forecast to increase substantially over coming years. Under central forecasts, road traffic is forecast to increase by 30% and rail journeys by 40%, rail freight has the potential to nearly double by 2030."*

6.14.7 As outlined within Chapter 4 of this Case for the Scheme and the TA [APP-193](~~**TR010065/APP/7.4**~~), the A46 at Newark-on-Trent currently has the worst performance of any section of the A46 between Leicester and Lincoln and congestion issues negatively impact upon the wider Newark-on-Trent area. In this regard, the key impacts of the Scheme in relation to traffic flows and network performance are.

- The Scheme is likely to result in substantial improvements to journey times on the A46 in both directions between Lodge Lane and Brough Lane in both 2028 and 2043. In 2043 there are forecast to be journey time savings of around seven minutes in each direction in the PM peak as a result of the scheme.
- A comparison of junction performance, with and without the Scheme, indicates that the Cattle Market roundabout is forecast to experience a substantial level of improvement as a result of the Scheme in both 2028 and 2043. All other junctions are forecast to continue to operate well within capacity as a result of the Scheme.
- The A46 through Newark-on-Trent is already heavily congested at peak times and without improvement, congestion on the A46 will become increasingly worse.
- The TA [APP-193](~~**TR010065/APP/7.4**~~) identifies that the Scheme would alleviate the existing and potential future issues with congestion on the section of the A46 through Newark-on-Trent, help to reduce accidents, reduce journey times and create additional capacity to support future growth.

6.14.8 Paragraph 2.6 of the NPSNN states: "There is also a need for development on the national networks to support national and local economic growth and regeneration, particularly in the most disadvantaged areas. Improved and new transport links can facilitate economic growth by bringing businesses closer to their workers, their markets and each other. This can help rebalance the economy."

6.14.9 Chapter 3 of this Case for the Scheme outlines the national and regional case for the Scheme. Chapter 5 of this Case for the Scheme also outlines the economic case for the Scheme, including the wider economic benefits, which would provide an overall benefit of £67.5 million.

6.14.10 Paragraph 2.13 of the NPSNN states: "The Strategic Road Network provides critical links between cities, joins up communities, connects our major ports, airports and rail terminals. It provides a vital role in people's journeys, and drives prosperity by supporting new and existing development, encouraging trade and attracting investment. A

well-functioning Strategic Road Network is critical in enabling safe and reliable journeys and the movement of goods in support of the national and regional economies."

6.14.11 As outlined within Table 3-3 of Chapter 3 of this Case for the Scheme, the Scheme would improve connections with the Humber Freeport, which rely on the A46. The DfT's RIS2 also recognises "the role of the A46 in connecting the Midlands, running from Lincoln to Gloucestershire via Leicester and Coventry" and states that "much of this road is already high-quality dual carriageway, and by filling in key sections it would be possible to create a coast-to coast highway without the need for major new roadbuilding across open countryside. The single greatest gap in this route is the A46 at Newark".

6.14.12 Paragraph 2.22 of the NPSNN states: *"Without improving the road network, including its performance, it will be difficult to support further economic development, employment and housing and this will impede economic growth and reduce people's quality of life. The Government has therefore concluded that at a strategic level there is a compelling need for development of the national road network".*

6.14.13 As outlined within Chapter 4 of this Case for the Scheme, the Scheme would reduce congestion and improve journey time reliability for local and long-distance road users by increasing capacity along the A46. In this respect, the Scheme represents the 'missing link' in the provision of a 143-kilometre high-quality dual carriageway route from Warwick to Lincoln, running along the A46, M69 and M1 around Leicester. This would help facilitate the delivery of housing and economic growth within Newark and the wider region.

Sustainable development

6.14.14 Both the NPSNN and NPPF seek to encourage development proposals to achieve a high level of sustainable development.

6.14.15 NPPF paragraph 8 states that achieving sustainable development means that the planning system has three overarching objectives – an economic objective, a social objective and an environmental objective. It states that these objectives are interdependent and need to be pursued in mutually supportive ways.

6.14.16 Paragraph 5.202 of the NPSNN recognises that the impacts from transport infrastructure schemes can be economic, social and environmental, and that consideration and mitigation of these impacts is important in achieving sustainable development.

6.14.17 The Scheme would fulfil the economic objective of sustainable development during the operational phase by increasing capacity and reducing congestion on the SRN. This would facilitate growth of a number of economic sectors, such as food and logistics, which are reliant on journey time reliability and network efficiency and dominate the regional economy. This would allow these industries to consolidate and build their businesses. The Scheme would also help to unlock

employment growth within Newark by facilitating the delivery of regional and local business developments as outlined within Tables 3-3 and 3-5 The Scheme would fulfil the social objective of sustainable development by supporting strong, vibrant and healthy communities. The Scheme would improve strategic and local connectivity in Newark-on-Trent and the wider area. The Scheme would also improve facilities for WCH and other vulnerable users, such as the elderly, school children and people with disabilities, where existing routes are affected. Chapter 12 (Population and Human Health) of the ES [REP3-011](~~**TR010065/APP/6.1**contained within Volume 6.1~~) sets out how some new WCH provision will be delivered as part of the Scheme, including a new WCH route that 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.

6.14.18 The Scheme would fulfil the environmental objective of sustainable development by seeking to avoid or mitigate environmental effects. Measures incorporated to mitigate effects are extensive and are outlined in the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1). The Scheme would also achieve a net gain in biodiversity as set out in Appendix 8.14, Biodiversity Net Gain Technical Report of the ES Appendices [APP-159](~~**TR010065/APP/6.3**~~).

6.14.19 The Environmental Masterplan, Figure 2.3 of the ES Figures [AS-026](~~**TR010065/APP/6.2**~~) has sought to create a range of habitats similar to those already present on site and affected by the Scheme. However, this would include habitats of higher biodiversity where possible, for example a species rich grassland would be provided where much of the existing grassland is species poor. The highway drainage has also been designed to provide swales and ponds of value to nature.

6.14.20 The Applicant therefore considers that the Scheme meets the requirements of the economic, social and environmental objectives of sustainable development as set out in the NPSNN.

6.14.21 Further information on how the Scheme meets environmental policy objectives is provided in summary below. Further information is also set out in the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) and the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

Air quality

6.14.22 NPSNN paragraph 5.3 states *“Increases in emissions of pollutants during the construction or operation phases of projects on the national networks can result in the worsening of local air quality”.*

6.14.23 Paragraph 5.4 of the NNNPS also sets out that air quality legislation concerns health impacts as well as impacts to ecosystems. Paragraph 5.5 explains that the development of road schemes can create complex challenges with regard to air quality, as the effects can be far

reaching over a larger area than just within the boundary of an individual scheme.

6.14.24 NPSNN paragraph 5.6 states that *"Where the impacts of the project (both on and off-scheme) are likely to have significant air quality effects in relation to meeting EIA requirements and / or affect the UK's ability to comply with the Air Quality Directive, the applicant should undertake an assessment of the impacts of the proposed project as part of the environmental statement."*

6.14.25 NPSNN paragraphs 5.7 to 5.9 set out the methodological requirements for this air quality assessment, which Chapter 5 (Air Quality) of the ES [AS-021](~~**TR010065/APP/6.1**~~) has followed.

6.14.26 NPSNN paragraph 5.10 *states "Where a project is likely to lead to a breach of the air quality thresholds, the applicant should work with the relevant authorities to secure appropriate mitigation measures with a view to ensuring so far as possible that those thresholds are not breached."*

6.14.27 NPSNN paragraph 5.12 states that: *"The Secretary of State must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant air quality impact in relation to EIA and / or where they lead to a deterioration in air quality in a zone/agglomeration."*

6.14.28 Chapter 5 (Air Quality) of the ES (~~**TR010065/APP/6.1**~~~~contained within Volume 6.1~~)[AS-021] considers the likely significant effects of Scheme on air quality. The chapter provides the following:

- Assessment of the potential impacts associated with construction dust and traffic management measures on sensitive human health receptors and designated habitats within the Scheme study area.
- Assessment of the potential air quality impacts of the Scheme on sensitive human health receptors and designated habitats within the Scheme study area.
- Assessment of the risk to affecting the UK's reported ability to comply with the Air Quality Directive[23] in the shortest timescales possible.
- Inclusion of mitigation measures where relevant and summary of overall significance of effects.

6.14.29 A qualitative assessment of potential dust effects for the Scheme has been undertaken, based on a review of likely dust raising activities and identification of sensitive receptors within 200 metres. Potential dust impacts would be suitably controlled using the best practice mitigation measures proposed. A qualitative assessment of the impacts associated with the construction traffic management measures has also been undertaken and concluded that due to the temporary nature of the measures, there are not expected to be

[23] Air Quality Directive (2008) Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe'.

significant air quality effects at nearby receptors during the construction phase. The Statement Relating to Statutory Nuisances [APP-186](~~TR010065/APP/6.7~~) identifies the relevant statutory nuisances set out in section 79(1) of the Environmental Protection Act (EPA) 1990 and considers the potential for any such statutory nuisances to arise as a result of the Scheme. Where the Scheme has the potential to create statutory nuisances, the Statement sets out the proposals for mitigating or limiting them. With the essential mitigation measures set out in the First Iteration EMP [REP4-010](~~TR010065/APP/6.5~~) in place, none of the statutory nuisances identified in section 79(1) of the EPA are predicted to arise during the construction and operation of the Scheme.

6.14.30 An assessment has been undertaken to assess the air quality impact during the operation of the Scheme at receptors, using the atmospheric dispersion model ADMS-Roads, which is a PC-based model of dispersion in the atmosphere of pollutants released from road traffic sources. The model has been verified against air quality monitoring data and has been used to estimate the air quality impacts of changes in traffic associated with the Scheme.

6.14.31 Concentrations across human health receptors are expected to be well below the NO_2, PM_{10} and $PM_{2.5}$ air quality objectives (the objectives being 40ug/m^3 for NO_2 and PM_{10}, and 20ug/m^3 for $PM_{2.5}$). The maximum modelled concentration for NO_2 in the opening year of the Scheme (2028) is predicted to be 31.9ug/m^3, whilst the maximum modelled concentration for PM_{10} in the base year of the Scheme (2022) is predicted to be 28.9ug/m^3. Section 5.5 of Chapter 5 (Air Quality) of the ES [AS-021](~~TR010065/APP/6.1~~) provides detail on why $PM_{2.5}$ has not been considered further within the operational phase of the local air quality assessment. The predicted effects from the operation of the Scheme on local air quality at human health receptors are therefore concluded to be not significant so no mitigation measures are proposed. The Scheme also does not affect the UK's reported ability to comply with the Air Quality Directive in the shortest timescales possible.

6.14.32 Ecological receptors that have the potential to be adversely affected by changes in nitrogen deposition have been assessed by the competent expert for Biodiversity in Chapter 8 (Biodiversity) of the ES [APP-052](~~TR010065/APP/6.1~~) which found that changes caused by the Scheme were not significant.

6.14.33 The construction mitigation measures identified for the Scheme are described in full in Chapter 5 (Air Quality) of the ES [AS-021](~~TR010065/APP/6.1~~) and summarised below.

6.14.34 Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-011](~~TR010065/APP/6.5~~). The First Iteration EMP will be developed into a Second Iteration EMP to be implemented during construction of the Scheme which will be secured through Requirement 2 of the draft DCO [REP4-

003](~~**TR010065/APP/3.1**~~). Detail on the First and Second Iteration EMPs, including how mitigation is secured within the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~), is provided within Section 4.4 of Chapter 4 (Environmental Assessment Methodology of the ES [APP-048](~~**TR010065/APP/6.1**~~).

6.14.35 Construction works would be carried out in accordance with the best practicable means, as described in Section 79(9) of the EPA 1990, to reduce fumes or emissions which may impact upon air quality. Further details can also be found in the Statement Relating to Statutory Nuisance [APP-186](~~**TR010065/APP/6.7**~~). As a minimum, the following measures are secured to prevent significant adverse effects during the construction phase:

- Avoid double handling of materials.
- Minimise height of stockpiles and profile to minimise wind-blown dust emissions and risk of pile collapse.
- Locate stockpiles out of the wind (or cover, seed or fence) to minimise the potential for dust generation.
- Ensure that all vehicles with open loads of potential dusty materials are securely sheeted or enclosed.
- Provide a means of removing mud and other debris from wheels and chassis of vehicles leaving the site. This may involve a simple coarse gravel running surface or jet wash, or in the case of a heavily used exit point, wheel washers.
- Maintain a low speed limit on site to prevent the generation of dust by fast moving vehicles.
- Damp down surfaces in dry conditions.
- Water to be sprayed during cutting/grinding operations.
- All vehicle engines and plant motors to be switched off when not in use.
- High dust generating activities within site compounds should be located as far away from nearby receptors as possible.

6.14.36 With regards to operation the results of the air quality assessment completed for this Scheme demonstrate that the Scheme would not have a significant air quality impact. This is because there will be no exceedances of the air quality objectives, no significant impacts at designated habitats or human health receptors and the Scheme would not affect reported compliance with the Air Quality Directive. On the basis of these conclusions no air quality mitigation is required during the operation of the Scheme.

6.14.37 Considering the results presented in Chapter 5 (Air Quality) of the ES [AS-021](~~**TR010065/APP/6.1**~~~~contained within Volume 6.1~~) the Scheme is consistent with national policy with respect to air quality. Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090].(~~**TR010065/APP/7.2**~~).

Historic environment

6.14.38 NPSNN paragraph 5.120 states "*The construction and operation of national networks infrastructure has the potential to result in adverse impacts on the historic environment."*

6.14.39 NPSNN paragraphs 5.121 to 5.125 outline that the historic environment comprises archaeology, historic buildings, structures and historic landscapes including parks and gardens. The elements of each of these that hold historic value can be considered to be 'heritage assets', the significance of which derive from their historic interest and setting.

6.14.40 NPSNN paragraph 5.126 states *"Where the development is subject to EIA the applicant should undertake an assessment of any likely significant heritage impacts of the proposed project as part of the Environmental Impact Assessment and describe these in the environmental statement."*

6.14.41 NPSNN paragraphs 5.131 to 5.135 set out the approach for considering the impacts to designated heritage assets. It specifically states: "*When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset's conservation. The more important the asset, the greater the weight should be".*

6.14.42 Paragraph 5.1.132 states: *"Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset, the greater the justification that will be needed for any loss".*

6.14.43 Paragraph 5.1.134 states: "*Where the proposed development will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use".*

6.14.44 Paragraph 5.124 in relation to non-designated assets states: *"Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to Scheduled Monuments, should be considered subject to the policies for designated heritage assets. The absence of designation for such heritage assets does not indicate lower significance".*

6.14.45 Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~) considers any likely significant effects of the Scheme upon cultural heritage assets. The assessment considers both construction and operational phase effects.

6.14.46 NPSNN paragraph 5.127 sets out the methodological requirements for this assessment, which Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~) has followed.

6.14.47 The requirements of the NPSNN in relation to identifying the significance of heritage assets and assessing and mitigating the effects of the Scheme on such assets have been taken account of in

the assessment, in order to identify the likely significant effects that the Secretary of State for Transport needs to give due regard to in their decision-making.

6.14.48 An assessment of the value/sensitivity (significance) of heritage assets has been carried out in accordance with criteria set out in Table 6-1 of Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~).

6.14.49 Eight designated built heritage assets are identified as likely to experience a total of eleven significant adverse effects arising from the construction of the Scheme as a result of changes to their setting, including visual or noise intrusions, or from the potential for direct impact as a result of partial loss, alteration, vibration or ground settlement during construction. These are:

- Temporary Large Adverse Effect:
  - (MM039) Farndon Windmill. Grade II listed
  - (MM141) Causeway Arches 650m north-west of level crossing. Grade II listed (Smeaton's Arches)
  - (MM228) Causeway Arches 550m north-west of level crossing. Grade II listed (Smeaton's Arches)
- Permanent Large Adverse Effect:
  - (MM141) Causeway Arches 650m north-west of level crossing. Grade II listed (Smeaton's Arches)
  - (MM228) Causeway Arches 550m north-west of level crossing. Grade II listed (Smeaton's Arches)
- Temporary Moderate Adverse Effect:
  - (MM026) Langford Hall. Grade II* listed
  - (MM038) Concrete Footbridge across the River Trent. Grade II* listed
  - (MM053) Lowwood. Grade II listed
  - (MM432) Winthorpe Conservation Area
  - (MM063) The Church of All Saints, Winthorpe. Grade II listed
- Permanent Moderate Adverse Effect:
  - (MM053) Lowwood. Grade II listed

6.14.50 Where possible the iterative development of the Scheme design has taken into account heritage assets identified through the assessment to date, including design adjustments to preserve these assets and their setting (further details are contained in Section 2.5 of Chapter 2 of the ES [APP-046](~~**TR010065/APP/6.1**~~). Further refinement of the design measures may minimise or reduce adverse effect upon these assets or their settings, most notably the Causeway Arches 650 metres and 500 metres north-west of the railway crossing (known locally as Smeaton's Arches) and Winthorpe Conservation Area (MM141, MM228, MM432).

6.14.51 Those assets which have the potential to be impacted structurally during the construction phase have been noted. Monitoring of vibration

on these assets will determine if there are any structural impacts arising, requiring mitigation through remedial repairs, and these monitoring requirements will be secured through the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~). Other temporary impacts are mitigated against through embedded design to minimise those impacts arising from the construction phase.

6.14.52 The significant effects on the grade II* and grade II designated assets identified above are not considered to result in substantial harm as defined in the NPPF and NPSNN. The impacts and effects described above do not result in substantial changes within the setting of, or direct physical impacts to, a designated asset, to a degree where the understanding of that heritage asset has been substantially altered.

6.14.53 Construction of the Scheme is likely to result in permanent significant adverse effects on the heritage value of several low to medium value, and one high value non-designated archaeological remains dating to the prehistoric, Roman and or early medieval periods. Direct physical impacts associated with groundworks required for the construction of new road infrastructure and/or floodplain compensation areas would result in the total loss or partial removal of below ground archaeological remains associated with these assets which would constitute a significant adverse effect. However, archaeological excavation and recording undertaken before the physical loss of the asset will advance our understanding of the significance of the asset and this retained information will form part of our collective cultural heritage that can be studied and enjoyed in the future.

6.14.54 A total of 20 non-designated archaeological assets are identified as likely to experience significant adverse effects as a result of the construction of the Scheme, following archaeological excavation and recording.

6.14.55 Further intrusive investigation is planned for summer/autumn 2023, which will include a programme of trial trenching and test pitting developed in consultation with cultural heritage stakeholders (NCC Senior Practitioner Archaeology and Senior Practitioner Historic Buildings and NSDC's Historic Environment Officer and Senior Conservation Officer). These investigations have the potential to identify additional unknown archaeological remains. As such Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~~~contained within Volume 6.1)~~ has included an assessment of the value and potential effects of the Scheme upon potential unknown archaeological remains (see Appendix 6.2 Assessment of Heritage Value [APP-133], Appendix 6.3 Assessment of Cultural Heritage Effects During Construction of the Scheme [APP-134] and Appendix 6.4 Assessment of Cultural Heritage Effects During Operation of the Scheme of the ES Appendices [APP-135]) (~~**TR010065/APP/6.3**~~). The assessment is based upon professional

judgement using the known baseline gathered for the Cultural Heritage DBA alongside the results of non-intrusive and intrusive archaeological investigations undertaken as part of the scheme (Appendices D to K of the Cultural Heritage DBA which is contained as Appendix 6.1 of the ES Appendices [AS-099] (~~**TR010065/APP/6.3**~~). The assessment has predicted potential significant effects upon unknown archaeological remains and as such the completion of the trial trenching and test pitting will not change the effects predicted within the assessment.

6.14.56 Any heritage assets identified through the continuing archaeological investigations, which will be removed or truncated as set out in the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~) will be suitably excavated and recorded to compensate for their loss. The social value of the Scheme will be enhanced through community engagement which will be implemented throughout the Scheme.

6.14.57 No significant permanent construction effects are expected upon the heritage value of any non-designated historic landscapes.

6.14.58 One designated heritage asset is identified as being significantly adversely affected by the operation of the Scheme as a result of additional noise intrusion into their setting. This is:

- Permanent Moderate Adverse Effect (MM053 Lowwood. Grade II listed)

6.14.59 The proximity of the existing A1 and A46 intrudes audibly into the setting of grade II Lowwood House (MM053). The noise detracts substantially from a peaceful experience of the property within its setting in contrast with the rural and wooded nature of its surroundings. Though noise assessments show that due to the impact of the A1, any additional impacts from the A46 are considered to be negligible in scientific terms, there will be a perception on the ground that noise impacts will significantly affect the heritage value of the asset. Consultation with the Conservation Officer raised the possibility of an application from the owners for replacement triple-glazed windows. This would result in a loss of historic fabric that could be avoided and would be an indirect impact of the operational use of the new road infrastructure. It is considered that the operational impacts of increased noise, perceived or real, additional light pollution and the possibility of loss of historic fabric, could result in a permanent Moderate Adverse effect. Due to the indirect nature of the impact, and potential for only partial loss of fabric, this is considered to be less than substantial harm.

6.14.60 There are no predicted significant operational effects on non-designated built heritage assets, archaeological remains or historic landscapes expected as a result of the operation of the Scheme.

6.14.61 Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~) sets out in detail the mitigation measures including embedded mitigation, considered through the design process. Embedded mitigation is further set out Chapter 2 (The

Scheme) of the ES [APP-046](~~TR010065/APP/6.1~~). Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-010](~~TR010065/APP/6.5~~). Details on the First and Second Iteration EMPs, including how mitigation is secured by Requirement 3 of the draft DCO [REP4-003](~~TR010065/APP/3.1~~), is provided within Section 4.4 of Chapter 4 (Environmental Assessment Methodology) of the ES [APP-048](~~TR010065/APP/6.1~~. The likely significant effects and mitigation requirements during construction of the Scheme are summarised in Table 6-7 of Chapter 6 (Cultural Heritage) of the ES [APP-050](~~TR010065/APP/6.1~~).

6.14.62 The Scheme has been carefully designed, as described in Chapter 2 (The Scheme) of the ES [APP-046](~~TR010065/APP/6.1~~). The careful design and mitigation has minimised the heritage impact of the Scheme. Policy and guidance recognise that not all impacts are able to be resolved in largescale schemes and the above residual impacts will be weighed against the longer term and wider benefits of the Scheme in environmental, safety, social and economic terms presented in this Case for the Scheme.

6.14.63 It is considered that the benefits of the Scheme outweigh these effects, as per paragraph 5.132 of the NPSNN. Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~TR010065/APP/7.2~~).

Landscape and visual impact

6.14.64 NPSNN paragraph 5.144 states: "*Where the development is subject to EIA the applicant should undertake an assessment of any likely significant landscape and visual impacts in the environmental impact assessment and describe these in the environmental assessment."*

6.14.65 NPSNN paragraphs 5.145 to 5.148 set out the methodological requirements for this assessment, which Chapter 7 (Landscape and Visual) of the ES [APP-051](~~TR010065/APP/6.1~~) has followed.

6.14.66 NPSNN paragraphs 5.150 to 5.153 state that great weight should be given to conserving nationally designated areas. The Scheme is not located within any nationally designated areas such as Areas of Outstanding Natural Beauty, a National Park, or the Broads.

6.14.67 NPSNN paragraph 5.156 states that *"Outside nationally designated areas, there are local landscapes that may be highly valued locally and protected by local designation. Where a local development document in England has policies based on landscape character assessment, these should be given particular consideration. However, local landscape designations should not be used in themselves as reasons to refuse consent, as this may unduly restrict acceptable development."*

6.14.68 The potential impact upon seven LCAs was assessed as part of the Landscape and Visual Impact Assessment (LVIA). Of the seven identified, two LCAs (LCA 1 Trent Washlands and LCA 2 Winthorpe

Village Farmlands) would experience temporary Significant Adverse effects during the construction of the Scheme. Two LCAs (LCA 1 Trent Washlands and LCA 2 Winthorpe Village Farmlands) are likely to experience Significant Adverse effects in Year 1. When considering the establishment of mitigation planting by Year 15, only one LCA (LCA 2 Winthorpe Village and Farmlands LCA) is considered to have a residual Significant Adverse effect as a result of the Scheme.

6.14.69 The potential impacts upon visual amenity were addressed through the assessment of 63 receptors identified within the visual envelope of the Scheme. Of those 63 receptors, 15 receptors would experience Significant Adverse effects during construction of the Scheme, reducing to 7 receptors in Year 1 of Operation. When considering the establishment of mitigation planting by Year 15, two visual receptors (No.24 being residential properties at Sandhills Park and No.40 users of the Trent Valley Way and NCN route 64 on Winthorpe Road), were considered to have a residual significant effect as a result of the Scheme.

6.14.70 NPSNN paragraph 5.160 states that adverse landscape and visual effects may be minimised through a variety of measures. Section 7.10 of Chapter 7 (Landscape and Visual) of the ES [APP-051](~~**TR010065/APP/6.1**~~) outlines the construction and operation mitigation measures for the Scheme.

6.14.71 Mitigation measures of relevance during construction are included within the First Iteration EMP (**TR010065/APP/6.5**) and Register of Environmental Actions and Commitments (REAC) contained within it. Detail on the First and Second Iteration EMPs, including how mitigation is secured by Requirement 3 of the draft DCO (**TR010065/APP/3.1**), is provided within Section 4.4 of Chapter 4 (Environmental Assessment Methodology) of the ES [APP-048](~~**TR010065/APP/6.1**~~).

6.14.72 Mitigation measures of relevance during operation are included within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~) and shown on Figure 2.3 Environmental Masterplan of the ES Figures [AS-026](~~**TR010065/APP/6.2**~~). This includes:

- New and replacement native planting.
- Retention and strengthening of hedgerows and linear belts of vegetation along the highway boundary where possible.
- Land used temporarily during construction would be reinstated to previous land use when not required for essential environmental mitigation.
- Appendix 7.4 Arboricultural Impact Assessment of the ES Appendices [APP-140](~~**TR010065/APP/6.3**~~) details specific mitigation in relation to potential remediation measures following construction with respect to trees.

6.14.73 A well-developed essential mitigation strategy has been produced. The landscape design strategy for the Scheme seeks to respond to

the local landscape character and physical topography of the area, aiding the settlement of the Scheme within the receiving environment. It also seeks to limit visual clutter and detracting features as far as possible, whilst mitigating impacts and enhancing biodiversity as part of a holistic design approach. Embedded mitigation incorporated into the Scheme design is outlined in Chapter 2 (The Scheme) of the ES, with the Environmental Masterplan shown in Figure 2.3 of the ES Figures [AS-026](~~**TR010065/APP/6.2**~~).

6.14.74 The Environmental Masterplan, Figure 2.3 of the ES Figures [AS-026](~~**TR010065/APP/6.2**~~) has sought to create a range of habitats similar to those already present on site and affected by the proposals. However, this would include habitats of higher biodiversity where possible, for example a species rich grassland would be provided where much of the existing grassland is species poor. The highway drainage has also been designed to provide swales and ponds of value to nature.

6.14.75 Enhancement measures seek to improve and/or restore local landscape character and visual amenity where possible, aligning with the Landscape Actions specified for the relevant policy zones established by the Newark and Sherwood Landscape Character Assessment SPD. Measures include enhancement of existing hedgerows within the Order Limits which would be undertaken where possible by means of coppicing, hedge laying or planting up gaps with native climate resilient species as appropriate.

6.14.76 The Scheme has been carefully designed, as described in Chapter 2 (The Scheme) of the ES [APP-046](~~**TR010065/APP/6.1**~~~~contained within Volume 6.1~~). The careful design and mitigation has minimised the landscape and visual impact of the Scheme. Policy and guidance recognise that not all impacts are able to be resolved in largescale schemes and the above residual impacts will be weighed against the longer term and wider benefits of the Scheme in environmental, safety, social and economic terms presented in this Case for the Scheme. For this reason, it is considered that the benefits of the Scheme outweigh these effects, as per paragraphs 5.157 and 5.158 of the NPSNN. Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

Land use, including agricultural land

6.14.77 NPSNN paragraph 5.168 states: *"Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation*

measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that it is not of high environmental value. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination and how it is proposed to address this".

6.14.78 Paragraph 5.176 - "The decision-maker should take into account the economic and other benefits of the best and most versatile agricultural land. The decision maker should give little weight to the loss of agricultural land in grades 3b, 4 and 5, except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy".

6.14.79 Chapter 9 (Geology and Soils) of the ES [REP3-009](~~**TR010065/APP/6.1**contained within Volume 6.1~~) assesses the effects of temporary and permanent loss of agricultural land. For agricultural land and soils, it is considered that with the inclusion of appropriate mitigation as detailed in the Outline Soils Management Plan (SMP) (Appendix B.3~~C~~ of the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~), there would still be significant adverse effects during the construction phase (associated with temporary and permanent land take). Significant effects are associated with temporary loss of ALC grade 2 (considered to be Moderate Adverse), and permanent loss of ALC grade 3a (considered to be Moderate Adverse) and ALC grade 3b (considered to be Large Adverse).

6.14.80 The Outline SMP (Appendix B.3~~C~~ of the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~) details the mitigation measures required to maintain agricultural soil quality and grade, ensuring where planned, land can be returned to agriculture. The Outline SMP guidance is designed to ensure that soil structure and overall quality does not unduly deteriorate during any instances of soil handling.

6.14.81 There will be no effects of loss of agricultural land during the operational phase as land lost permanently from agriculture will already have been removed in the construction phase.

6.14.82 The minimisation of the area of permanent and temporary land take of agricultural land within the Order Limits has been a fundamental consideration throughout the design of the Scheme.

6.14.83 Given the fixed location of the existing highway infrastructure that represents the start and end points of the Scheme there are no opportunities to deliver the Scheme in a way that avoids the development of any agricultural land. The use of some agricultural land is therefore necessary, as per NPSNN paragraph 5.168. Policy and guidance recognise that not all impacts are able to be resolved in largescale schemes and the above impacts will be weighed against the longer term and wider benefits of the Scheme in environmental, safety, social and economic terms presented in this Case for the Scheme. Further information on the Scheme's compliance with the

NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

Noise

6.14.84 NPSNN paragraphs 5.189 to 5.191 set out the methodological requirements for a noise assessment, which Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**~~~~contained within Volume 6.1~~) has followed.

6.14.85 NPSNN paragraph 5.193 states: *"Developments must be undertaken in accordance with statutory requirements for noise. Due regard must have been given to the relevant sections of the Noise Policy Statement for England, National Planning Policy Framework and the Government's associated planning guidance on noise".*

6.14.86 The Noise Policy Statement for England (NPSE) purpose is to promote *"good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".* The three main aims are to:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

6.14.87 The NPPF Paragraph 191(a) reiterates the first two of the above NPSE aims, whilst the NPSNN paragraph 5.195 states that the Secretary of State should not grant development consent unless satisfied the proposals will meet the same aims as set out in the NPSE.

6.14.88 On the basis of the three road traffic noise objectives outlined within NPSNN paragraph 5.195, Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**~~~~contained within Volume 6.1~~) considers the following concepts in the assessment of noise impact:

- Lowest Observed Adverse Effect Level (LOAEL): this is the level above which adverse effects on health and quality of life can be detected.
- Significant Observed Adverse Effect Level (SOAEL): this is the level above which significant adverse effects on health and quality of life occur.

6.14.89 Chapter 11(Noise and Vibration) of the ES [APP-055](~~TR010065/APP/6.1~~~~contained within Volume 6.1~~) has considered potential temporary and permanent noise and vibration impacts arising as a result of the Scheme during construction and operation.

6.14.90 The assessment of construction noise shows:

- Enabling works/ Earthworks and flood compensation/ Ground improvement/ Bridge structures/ Drainage/ Roadworks/ Construction compounds/ and Kelham and Averham FCA construction phases, each have the potential to result in significant adverse effects during the daytime.
- Enabling works/ Bridge structures/ and Roadworks construction phases each have the potential to result in significant adverse effects during the night-time.
- Suitable mitigation measures to avoid significant adverse effects are described within the relevant sections under the 'Construction noise' heading in Section 11.11 of Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**contained within Volume 6.1~~).
- Potentially significant adverse effects would be avoided if construction works in the vicinity of relevant receptors do not extend to a period of 10 or more days of working in any 15 consecutive days or take place for a total number of days exceeding 40 in any 6 consecutive months.
- A section 61 application process between the Contractor and the Local Authority in advance of the works would ensure potential cumulative levels and relevant mitigation measures are adopted to avoid significant adverse effects.

6.14.91 The assessment of construction vibration shows:

- During the road works and earthworks, representative receptor 126728 is likely to be subject to moderate adverse impacts.
- During the bridge construction works, representative receptors 125789 and 126201 are likely to be subject to moderate adverse impacts.
- During the retaining wall construction, representative receptor 97471 is likely to be subject to moderate adverse impacts.
- Indicative mitigation measures to avoid significant adverse effects are described within the relevant sections under the 'Construction vibration' heading in Section 11.11 of Chapter 11 (Noise and Vibration) of the ES [APP-055](~~**TR010065/APP/6.1**contained within Volume 6.1~~).
- Potentially significant adverse effects would be avoided if construction works within 100m of relevant receptors do not extend to a period of 10 or more days of working in any 15 consecutive days or take place for a total number of days exceeding 40 in any 6 consecutive months.

6.14.92 In line with NPSNN paragraph 5.196 which states "the Secretary of State should consider whether requirements are needed which specify that the mitigation measures put forward by the applicant are put in place". Section 61 of the Control of Pollution Act 1974 allows developers to apply for prior consent for noise generating activities. A section 61 application process between the Principal Contractor and the Local Authority in advance of the works would ensure potential cumulative levels and relevant mitigation measures are adopted to avoid significant adverse effects. The Statement Relating to Statutory

Nuisances [APP-186](~~TR010065/APP/6.7~~) identifies the relevant statutory nuisances set out in section 79(1) of the Environmental Protection Act 1990 and considers the potential for any such statutory nuisances to arise as a result of the Scheme. Where the Scheme has the potential to create statutory nuisances, the Statement sets out the proposals for mitigating or limiting them.

6.14.93 The assessment of operational noise shows:

- No residual significant adverse effects have been identified as a result of the Scheme.
- No properties eligible for noise insulation under the Noise Insulation Regulations 1975 (amended 1988) have been identified.
- Avoiding significant adverse effects would comply with the first aim of NPSE.
- Provision of mitigation to control adverse noise impacts would facilitate meeting the second and third aim of the NPSNN and NPSE.

6.14.94 Some dwellings would be subject to moderate or major noise decreases in the short-term and to moderate noise decreases in the long-term, supporting the third aim of the NPSE.

6.14.95 The Scheme has been designed, as far as reasonably practicable, to minimise noise and vibration effects on sensitive receptors. Embedded mitigation for the Scheme is set out in Chapter 2 (The Scheme) of the ES [APP-046](~~TR010065/APP/6.1~~~~contained within Volume 6.1~~).

6.14.96 Embedded mitigation measures incorporated in the Scheme design include landscape earthworks, noise barriers and bridge safety parapets. These features are described in detail in Chapter 11 (Noise and Vibration) of the ES [APP-055](~~TR010065/APP/6.1~~~~contained within Volume 6.1~~) and shown on Figure 2.3 Environmental Masterplan of the ES Figures [AS-026](~~TR010065/APP/6.2~~).

6.14.97 Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-010](~~TR010065/APP/6.5~~) which will be developed into a Second Iteration EMP for implementation during construction of the Scheme. Details on the First and Second Iteration EMPs, including how mitigation is secured by Requirement 2 of the draft DCO [REP4-003](~~TR010065/APP/3.1~~), is provided within Section 4.4 of Chapter 4 (Environmental Assessment Methodology) of the ES [APP-048](~~TR010065/APP/6.2~~).

6.14.98 Overall, no residual significant adverse noise and vibration effects have been identified as a result of the operation of the Scheme. As set out above the Scheme has been designed as far as reasonably practicable to minimise noise and vibration effects on sensitive receptors, with embedded mitigation. There are also a number of mitigation measures identified and incorporated within the First EMP [REP4-010](~~TR010065/APP/6.5~~). For this reason, it is considered that the Scheme complies with NPSNN paragraph 5.195, and 5.196.

Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~TR010065/APP/7.2~~).

Climate

6.14.99 NPSNN paragraph 5.17 states: "*Carbon impacts will be considered as part of the appraisal of scheme options (in the business case), prior to the submission of an application for DCO. Where the development is subject to EIA, any Environmental Statement will need to describe an assessment of any likely significant climate factors in accordance with the requirements in the EIA Directive. It is very unlikely that the impact of a road project will, in isolation, affect the ability of Government to meet its carbon reduction plan targets. However, for road projects applicants should provide evidence of the carbon impact of the project and an assessment against the Government's carbon budgets".*

6.14.100 Chapter 14 (Climate) of the ES [APP-058](~~TR010065/APP/6.1~~) provides an assessment of the effects of the Scheme on climate associated with GHG emissions.

6.14.101 Section 14.13 of Chapter 14 (Climate) of the ES [APP-058](~~TR010065/APP/6.1~~) outlines that no significant effects on climate are anticipated. The construction and operation of the Scheme would result in an overall increase 725,643 tCO2e in GHG emissions. However, the contributions of the Scheme to any of the relevant UK carbon budgets (the 4th, 5th and 6th carbon budgetary period) are less than 0.007%, and so the assessment concludes no significant effect as the GHG emissions impact of the Scheme would not have a material impact on the UK government meeting its legally binding carbon reduction targets.

6.14.102 Section 14.10 of Chapter 14 (Climate) of the ES [APP-058](~~TR010065/APP/6.1~~) outlines mitigation measures for both design and construction of the Scheme.

6.14.103 Key design intervention at Preliminary Design included:

- Reduced depth of cross section and steepened earthworks incorporated which reduced material volume and subsequently resulted in carbon reduction.
- There has been substantial reduction in construction emissions from pavements due to change in pavement material and reduction of the area of full depth resurfacing. This has been achieved by retaining where possible the existing A46 and by utilising surface course materials that require replacing much later than traditional low noise surfaces.
- Emission reduction achieved in structures, due to reduction in the number and size of the structures.
- Pavement designed to last 17-20 years compared to the standard 12-year life of pavement. This reduces the operational maintenance emissions for the lifetime of the Scheme.

6.14.104 Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~) which will be developed into a Second Iteration EMP which will be implemented during construction of the Scheme. The mitigation measures and commitments are secured by Requirement 3 of the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~). Further details are provided within section 4.4 of Chapter 4 (Environmental Assessment Methodology) of the ES [REP4-048](~~**TR010065/APP/6.5**~~). Those mitigation measures of relevance to climate include the following:

6.14.105 The Principal Contractor is to engage with the subcontractors and suppliers to support the development of the Carbon Management Plan on the provision of the following:

- Low/zero carbon solutions.
- Competency/training requirements.
- Reporting expectations.
- Collaboration requirements.

6.14.106 A construction Carbon Management Plan would be completed by the Principal Contractor as part of the Second Iteration EMP and will include the following topics:

- Procurement.
- Materials and resource management on site.
- Change process for low/zero carbon solutions.
- Low/zero carbon plant and management.
- Construction techniques and competency.
- Training matrix.

6.14.107 A number of potential impacts of climate change on the Scheme during construction and operation were identified. Impacts due to climate change will increase in the long-term, however, the construction period is in the near future and shorter in duration. In addition, mitigation has been identified during the construction phase to reduce the potential impacts therefore there are not considered to be any significant impacts on the construction phase as a result of climate change.

6.14.108 The assessment of operational impacts on the resilience of the Scheme to climate change has considered the likelihood of climate events and hazards occurring, and the consequence of the potential impacts on disruption on the road network. Embedded mitigation measures have been included to reduce the risk and consequence of impacts. In addition, through construction and operation further monitoring and determination of operational procedures would occur to further reduce the impacts. With implementation of the mitigation, it has been concluded that no significant effects would occur to the Scheme in respect of climate change. Further enhancement will be sought through detailed design.

6.14.109 The assessment shows no significant adverse effects have been identified as a result of the Scheme. It is considered that the Scheme complies with NPSNN paragraph 5.195. Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

Biodiversity and ecological conservation

6.14.110 NPSNN paragraph 5.22 states: *"Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems."*

Sites of international and national importance sites

6.14.111 NPSNN paragraph 5.27 states: *"The most important sites for biodiversity are those identified through international conventions and European Directives. The Habitats Regulations provide statutory protection for European sites (see also paragraphs 4.22 to 4.25). The National Planning Policy Framework states that the following wildlife sites should have the same protection as European sites:*

- *potential Special Protection Areas and possible Special Areas of Conservation;*
- *listed or proposed Ramsar sites; and*
- *sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation and listed or proposed Ramsar sites."*

6.14.112 There are no designated sites of international importance (National Site Network or Ramsar sites) within 2 kilometres of the Scheme or within 200 metres of the ARN. There are no sites within the National Site Network where bats are a qualifying feature, within 30 kilometres of the Scheme.

6.14.113 Humber Estuary Ramsar, SAC and SPA are hydrologically connected to the Scheme, downstream of the River Trent. The Humber Estuary Ramsar and SAC are located approximately 53 kilometres directly from the Order Limits and 75 kilometres via the River Trent. The Humber Estuary SPA is located approximately 63 kilometres directly from the Order Limits and 75 kilometres via the River Trent. Given the distance of the SPA from the Order Limits and the nature of the qualifying feature for this designation (various bird species and the non-breeding waterfowl assemblage), the Scheme will not impact this designated site and so it has been scoped out of further assessment. The SAC is also of international importance for Annex I habitats present. These receptors will not be affected by the

Scheme due to the distance from source of potential impacts and so habitats within the SAC are scoped out of further assessment. River lamprey Lampetra fluviatilis and sea lamprey Petromyzon marinus (qualifying features of the Humber Estuary Ramsar and SAC) migrate up rivers to spawn and therefore the River Trent may serve as a migratory route or habitat for lamprey species. The Humber Estuary Ramsar and SAC are included in the baseline for this reason. No significant areas of gravel substrate suitable for lamprey spawning have been identified within the Order Limits or within 2 kilometres downstream within the River Trent.

6.14.114 Although a combination of residual light spill and noise and vibration disturbance during construction night works at Nether Lock Viaduct and Windmill Viaduct will act as a barrier to lamprey migration, the northern branch of the River Trent will likely act as a bypass to the upper reaches during this period (the main route for lamprey migration). Furthermore, works at Kelham and Averham FCA will be completed prior to commencement of main alignment works. The integrity of the river and sea lamprey population and the Humber Estuary SAC and Ramsar are not considered to be affected during construction as there will be no habitat loss, severance of migration routes or degradation of lamprey spawning substrate. Therefore, following the implementation of aforementioned mitigation measures set out in Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.5**~~) a negligible adverse impact is anticipated at a county level, leading to a Slight Adverse effect during construction that is not significant.

6.14.115 No impact pathways have been identified for the Humber Estuary SAC or Ramsar during operation.

6.14.116 A Habitats Regulations Assessment [REP3-024](~~**TRA010065/APP/6.6**~~) is included within the DCO application. This considers whether the proposed Scheme has the potential to result in significant effects on European sites of biodiversity interest. Embedded measures and essential mitigation measures detailed within the Stage 1 Screening and Stage 2 Appropriate Assessment respectively in the Habitats Regulations Assessment [REP3-024](~~**TR010065/APP/6.6**~~) are considered to achieve an overall negligible residual effect upon lamprey. Likely significant effects associated within the Scheme, either alone or in-combination with any other projects or plans, can be ruled out. Therefore, there is not considered to be a requirement to proceed to Stage 3 (Derogation).

Sites of Special Scientific Interest (SSSIs)

6.14.117 NPSNN paragraph 5.29 states: *“where a proposed development on land within or outside a SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted”.*

6.14.118 There are no SSSIs located within the study area.

Regional and local sites

6.14.119 NPSNN paragraph 5.31 states: *"Sites of regional and local biodiversity and geological interest (which include Local Geological Sites, Local Nature Reserves and Local Wildlife Sites and Nature Improvement Areas) have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the community, and in supporting research and education. The Secretary of State should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent."*

6.14.120 Section 8.8 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) identifies 54 non-statutory designated sites of county importance located within 1 kilometre of the Scheme and/or within 200 metres of the ARN (which are considered to support habitats sensitive to nitrogen deposition).

6.14.121 Section 8.13 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) outlines the impact of the Scheme on regional and local sites. The assessment concludes:

- A Moderate Adverse effect is anticipated on Great North Road Grasslands LWS during construction.
- A Slight Adverse effect is anticipated on Dairy Farm Railway Strip, Newark LWS, Newark (Beet Factory) Dismantled LWS, Old Trent Dyke LWS and Newark Trent Grassland LWS during construction.
- No effects are anticipated on the remaining LWS during construction and operation. These include Kelham Hall Shingle Bank LWS, Kelham Road Grassland LWS, Kelham Road Grassland II LWS, Newark Dismantled Railway LWS, Railway LWS, Newark Grassland LWS, Redoubt Grassland LWS, River Trent – Kelham LWS, River Trent, Staythorpe LWS, Trent Banks/Wharves, Newark LWS and Valley Farm Grassland LWS.

6.14.122 Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) sets out the compensation and mitigation measures. Due to the proximity of LWS immediately adjacent to the existing road network, an air quality barrier would not be feasible as it would result in the direct loss of habitat along the edge of the LWS for installation, whilst maintaining sight lines of road users and the working area of Vehicle Restraint Systems (VRS). Where possible, habitats within LWS in poor condition will be enhanced to compensate for increased nitrogen deposition during operation which cannot be mitigated. As planting along the A46 carriageway corridor establishes, it will act as more of a buffer over time to adjacent grassland shown in Figure 2.3 Environmental Masterplan of the ES Figures [AS-026](~~**TR010065/APP/6.2**~~).

6.14.123 Mitigation measures to minimise the impacts of the Scheme during construction are included within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~).

Irreplaceable habitats including ancient woodland and veteran trees

6.14.124 NPSNN paragraph 5.32 states: *"The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this."*

6.14.125 Section 8.8 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) identifies, four veteran trees within the Order Limits and a further four veteran trees were recorded within 200 metres of the ARN. No ancient woodlands or ancient trees have been identified within 1 kilometre of the Order Limits.

6.14.126 Following numerous design iterations to avoid root protection areas (RPA), the Scheme will result in the unavoidable direct partial impact on the RPA of three veteran trees (T038, T136, T139), caused by construction of a maintenance track and earthworks, including drainage pipe installation. This has the potential to cause considerable damage, affecting the integrity of these three veteran trees. One veteran tree (T139) will also require a minor crown lift (<0.5 metres) to provide clearance for the construction plant.

6.14.127 Mitigation measures to minimise the impacts of the Scheme during construction are included within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~). Whilst the Scheme design iterations have resulted in the retention of veteran trees, the impact on three is unavoidable. It is anticipated that, with arboricultural supervision to ensure works are undertaken in line with best practice, the level of disturbance stated above can be tolerated by these trees. It is difficult to predict this with certainty and therefore ongoing monitoring would be undertaken to inform any remedial action. The need for management of the retained veteran tree crown (for clearance of maintenance vehicles) would be assessed during the annual monitoring surveys of the veteran tree health (as detailed in the First Iteration EMP (**TR010065/APP/6.5**).

6.14.128 With the above mitigation measures in place, Section 8.13 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) states that a Slight Adverse effect is anticipated on the three veteran trees during construction.

Net loss and net gain in biodiversity

6.14.129 NPSNN paragraph 5.33 states: *"Development proposals potentially provide many opportunities for building in beneficial biodiversity or geological features as part of good design. When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered."*

6.14.130 Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) identifies opportunities for Biodiversity Net Gain (BNG) and enhancement of biodiversity resources. The potential for the Scheme to deliver biodiversity net gains has been considered as part of the design-development and assessment processes. Loss of any habitat of conservation value will be replaced like-for-like (in condition) as a minimum requirement providing a greater area than was lost. Habitat replanting will achieve a biodiversity net gain for key habitat of principal importance in the long-term, once established. Native and locally sourced species will be used in landscape design.

6.14.131 The Scheme will achieve a net gain in habitat units within the Order Limits of the Scheme with the exception of the areas of impact and compensation for lowland meadow. Further information is contained within Appendix 8.14 (Biodiversity Net Gain Technical Report) of the Environmental Statement Appendices [APP-159](~~**TR010065/APP/6.3**~~).

Protected species and habitats of importance

6.14.132 NPSNN paragraph 5.34 states: *"Many individual wildlife species receive statutory protection under a range of legislative provisions".*

6.14.133 NPSNN paragraph 5.35 states that "the Secretary of State should ensure that measures have been taken to ensure that these species and habitats are protected from the adverse effects of development. Development consent should be refused where harm to the habitats or species would result, unless the benefits of the development (including need) clearly outweigh that harm".

6.14.134 Habitat surveys have been undertaken to understand the existing ecological conditions. A desk study and further ecological surveys have been undertaken to gather baseline information on protected and notable species in the vicinity of the Scheme. This includes surveys for barn owls, bats, badgers, wintering birds, breeding birds, reptiles, great crested newt, fish and water voles. The outcomes of the surveys undertaken are summarised in Section 8.5 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~). The assessments conclude the following:

- The Scheme is anticipated to have a Slight Adverse effect during construction on badger, bats, breeding and wintering birds, fish, reverting to Neutral once operational.
- The Scheme is anticipated to have a Slight Adverse effect on barn owls during construction and operation.
- The Scheme is anticipated to have a Slight Adverse effect during construction on invertebrates (aquatic and terrestrial) and water vole.
- The Scheme is anticipated to have a Slight Beneficial effect on reptiles during construction.
- The Scheme is anticipated to have a Neutral effect on otter during construction and operation.

6.14.135 Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~) sets out the compensations measures for such species during construction and operation, and the overall mitigation including embedded mitigation. With the implementation of essential mitigation measures within Section 8.10 of Chapter 8 (Biodiversity) of the ES [APP-052](~~**TR010065/APP/6.1**~~), the conclusion of the biodiversity assessment reports the residual effects to receptors which are determined after mitigation has been taken into account. The habitat strategy is based on the principles of no net loss and has also achieved a net gain in habitats of biodiversity value which are of benefit to a wide range of protected species. In the case of lowland meadow, a compensation strategy has been designed to address unavoidable losses to this very high distinctiveness habitat (as detailed in the Biodiversity Net Gain Technical Report Appendix 8.14 of this ES Appendices [APP-159](~~**TR010065/APP/6.3**~~) and the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~).

6.14.136 A five-year aftercare period will follow completion of the construction works. During this time, maintenance activities will be undertaken to ensure the successful establishment of planting and provision of new functioning habitats. Maintenance and monitoring tasks are included in the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~) and would be included within the Second Iteration EMP, which would be secured through Requirement 3 of the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~). This would include the replacement of failed or defective plants. The Second Iteration EMP will include a Landscape and Ecological Management Plan (LEMP). The LEMP will outline management and monitoring requirements for landscape and ecology aspects for the Scheme to ensure the successful establishment of essential mitigation.

6.14.137 A range of mitigation measures have been included in the Scheme to reduce adverse impacts on species, designated sites and habitats. The potential for the Scheme to deliver biodiversity net gains has been considered as part of the design-development from the outset, the Scheme will achieve a net gain in habitats of biodiversity value. Following numerous design iterations to avoid impact to veteran trees there will be an unavoidable direct impact on three caused by

construction and maintenance earthworks that cannot be avoided. There will be ongoing monitoring for one veteran tree that requires a crown lift. Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090]~~(TR010065/APP/7.2)~~.

Road drainage and water environment

Flood risk

6.14.138 Paragraphs 5.90 to 5.115 of the NPSNN set out the requirements for a Flood Risk Assessment (FRA) to be submitted with an application and provides guidance on the methodology to be used. An FRA has been undertaken which can be found in Appendix 13.2 of the ES Appendices [APP-177]~~(TR010065/APP/6.3)~~ given the majority of the Scheme is within Flood Zones 2 and 3. This assesses the flood risk impact of the Scheme during construction and operation. Hydraulic modelling has been undertaken to inform the flood mitigation measures required which compromises of floodplain compensation areas. The results are presented as Appendix 13.2 Flood Risk Assessment of the ES Appendices [APP-177]~~(TR010065/APP/6.3)~~. The FRA in Appendix 13.2 of the ES Appendices (**TR010065/APP/6.3**) has been carried out in accordance with the NPSNN requirements. A summary of the methodology and findings of the FRA are also presented in Chapter 13 (Road Drainage and the Water Environment) of the ES [APP-057]~~(TR010065/APP/6.1)~~.

6.14.139 The FRA in Appendix 13.2 of the ES Appendices [APP-177]~~(TR010065/APP/6.3)~~ concluded that through appropriate drainage mitigation, as outlined within the Drainage Strategy in Appendix 13.4 of the ES Appendices [APP-179]~~(TR010065/APP/6.3)~~, surface water flood risk to sensitive receptors is not increased as a result of the Scheme. Therefore, the magnitude of flood risk on the surface waterbodies, groundwater and protected areas are considered to be negligible.

6.14.140 The main flood risk sources within the Scheme study area are fluvial, surface water and groundwater. The risk from sewer flooding is minimal given the Scheme would not interact with sewer networks, and a lack of historical sewer flooding has been recorded in the vicinity of the Scheme. The risk of artificial flooding is similarly low, as the reservoirs in the area are regularly inspected. Additionally, the FCAs outlined within Section 3.7 are free draining so do not increase the risk of artificial flooding due to a burst. A summary of flood risk is outlined in Table 10-1 of the FRA in Appendix 13.2 of the ES Appendices [APP-177]~~(TR010065/APP/6.3)~~.

Sequential test

6.14.141 NPSNN paragraph 5.105 states *"preference should be given to locating projects in Flood Zone 1. If there is no reasonably available site in Flood Zone 1, then projects can be located in Flood Zone 2. If*

there is no reasonably available site in Flood Zones 1 or 2, then national networks infrastructure projects can be located in Flood Zone 3, subject to the Exception Test. If the development is not essential transport infrastructure that has to cross the area at risk, it is not appropriate in Flood Zone 3b, the functional floodplain where water has to flow and be stored in times of flood."

6.14.142 The Scheme alignment passes through Flood Zone 3, and therefore does not automatically pass the Sequential Test. As the Scheme is utilising an existing highway route that passes through Flood Zone 3 it is not viable to relocate the works in a zone with a lower probability of flooding or to avoid crossing the A1, the River Trent and other Watercourses. The Scheme alignment has been developed following a comprehensive assessment of different alignment options, which considered all environmental impacts (inclusive of flood risk) during Options Selection of the Scheme. The Scheme is classed as Essential Infrastructure and passes through Flood Zone 3. Therefore, the Scheme must be assessed against the Exception Test.

Exception test

6.14.143 NPSNN paragraph 5.106 states that the exception test can be applied if following the application of the Sequential Test it is not possible for the scheme to be located in a lower zone of flood. NPSNN paragraph 5.108 states: "*For the Exception Test to be passed:*

- *it must be demonstrated that the project provides wider sustainability benefits to the community that outweigh flood risk; and*
- *an FRA must demonstrate that the project will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, will reduce flood risk overall."*

6.14.144 To satisfy the Exception Test, hydraulic modelling has been developed to assess the flood risk to and from the Scheme where it resides in Flood Zone 3. Overall, the modelling results demonstrated that there is no significant impact on flooding once the Scheme is operational or during the construction stage.

6.14.145 Since the Scheme is defined as an NSIP, it is considered that the Exception Test is satisfied in terms of the benefits to the community. Chapter 13 (Road Drainage and Water Environment) of the ES [APP-057](~~**TR010065/APP/6.1**~~) demonstrates that mitigation measures have been incorporated into the design to ensure that the new road will be at a low risk of flooding and will be safe for the lifetime of the development without increasing flood risk to receptors elsewhere.

6.14.146 It is considered that there will be no significant increase in fluvial flood risk to the neighbouring land uses, or an increase in surface water runoff as a result of the Scheme based on the application of identified mitigation measures. This is set out in Sections 4 and 5 of the NPSNN, which guides how DCO applications will be decided and

how impacts of national networks infrastructure should be considered (Section 4.2.3).

6.14.147 The mitigation outlined includes, three FCAs ('Kelham and Averham FCA' and 'Farndon East FCA' and 'Farndon West FCA') which have been incorporated within the design as mitigation to compensate for a loss of floodplain storage as a result of the Scheme.

6.14.148 Farndon East FCA and Farndon West FCA will be designed and landscaped to drain into the Old Trent Dyke.

6.14.149 Kelham and Averham FCA will be designed to drain into an existing highways and agricultural drain to the south of the FCA via a culvert under the A617. This agricultural/highways drain discharges into the River Trent.

Water quality

6.14.150 NPSNN paragraph 5.219 states: *"Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters and coastal waters. During the construction and operation, it can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment. There may also be an increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health or on protected species and habitats (see Section paragraphs 5.20 to 5.38 on biodiversity and geological conservation), and could, in particular, result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Framework Directive."*

6.14.151 Chapter 13 (Road Drainage and the Water Environment) of the ES [APP-057](~~**TR010065/APP/6.1**~~) gives consideration to the potential effect of the Scheme on water quality.

6.14.152 Paragraphs 5.225 and 5.226 of the NPSNN consider the Water Framework Directive (WFD). The WFD is European Union Directive which commits member states to achieve good status of all waterbodies (both surface and groundwater), and also requires that no such waterbodies experience deterioration in status. Good status is a function of good ecological and good chemical status, defined by a number of elements. A WFD assessment has been undertaken and is presented as Appendix 13.1 of the ES Appendices [APP-176](~~**TR010065/APP/6.3**~~). This considers compliance of the Scheme with the relevant WFD objectives for designated waterbodies that may be affected. The WFD assessment includes whether the Scheme might cause deterioration or prevent the improvement in the overall status (or potential for heavily modified and artificial waterbodies) of these waterbodies. The results are presented in Appendix 13.1 Water Framework Directive Compliance Assessment of the ES Appendices [APP-176](~~**TR010065/APP/6.3**~~).

6.14.153 This assessment concludes the following:

- that implementation of the mitigation mentioned in the detailed assessments is necessary to ensure the Scheme does not cause further deterioration.
- The Scheme is not anticipated to prevent any waterbodies within the study area from reaching their target 'Good' status in the future, as potential impacts resulting from various elements of the Scheme are expected to have only small-scale localised impacts.
- There is opportunity for the Scheme to contribute to improvements in the waterbody status of the Trent from Soar to Beck waterbody (GB104028053110). A wetland area is proposed to be created in the Farndon East FCA where the borrow pits could also be refilled and planted to create wetland areas, however this remains a high-level concept at this time.
- The Scheme is also not expected to affect the status of WFD linked protected areas.

6.14.154 Although no likely significant residual effects are predicted, surface water quality and groundwater monitoring are proposed during and post construction to ensure that mitigation measures are being implemented effectively. Further details are set out in Section 13.10 of Chapter 13 (Road Drainage and the Water Environment) of the ES [APP-057](~~**TR010065/APP/6.1**~~).

6.14.155 With the implementation of relevant embedded mitigation measures within Section 2.5 of Chapter 2 (The Scheme) of the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) and essential mitigation outlined in Section 13.10 of Chapter 13 (Road Drainage and the Water Environment) of the ES [APP-057](~~**TR010065/APP/6.1**~~), the conclusions of the road drainage and the water environment assessment report on the residual effects for receptors. This determines that, after mitigation has been taken into account, the Scheme would not result in any significant adverse effects to road and water environment receptors during both construction and operation.

6.14.156 Embedded mitigation includes the developed drainage strategy incorporated within the design, and the construction of the FCAs prior to an increase in impermeable surfacing. Essential mitigation is detailed within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~). Chapter 13 (Road Drainage and the Water Environment) of the ES [APP-057](~~**TR010065/APP/6.1**~~).

6.14.157 Through good design and embedded mitigation, the Scheme has avoided or minimised any impacts on watercourses and in accordance with NPSNN paragraph 5.220, the Scheme would not contribute to unacceptable levels of water pollution.

6.14.158 Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

Walkers, cyclists and horse-riders

6.14.159 NPSNN paragraph 3.17 states*: "There is a direct role for the national road network to play in helping pedestrians and cyclists. The Government expects applicants to use reasonable endeavors to address the needs of cyclists and pedestrians in the design of new schemes."*

6.14.160 NPSNN paragraph 3.22 and 5.205 also states applicants should seek to address historic issues where the national road network creates a barrier to cycling and walking thereby severing communities.

6.14.161 NPSNN paragraph 5.216 states: *"Where development would worsen accessibility such impacts should be mitigated so far as reasonably possible. There is a very strong expectation that impacts on accessibility for non-motorised users should be mitigated."*

6.14.162 The needs of WCHs have been taken into account during the design process of the Scheme and mitigation measures have been included where necessary, as per the requirements of NPSNN paragraph 5.216. For example, Chapter 2 (The Scheme) of the ES [APP-046](~~**TR010065/APP/6.1**~~) describes how the Scheme addresses the instances where it will be necessary to sever a PRoW, and the improvements to WCH facilities.

6.14.163 Along the route there would be one permanently stopped up PRoW for which a diversion is provided (FP14) with other walking and cycling routes impacted slightly due to the Scheme. Provisions have been included in the design to replace and, where feasible and appropriate, improve existing routes and facilities within the Order Limits that are used by pedestrians and cyclists, the objective being to ensure continued connectivity would be provided for WCH users between communities and routes within the wider PRoW network.

6.14.164 Therefore, there are likely to be both beneficial and adverse impacts upon people's journey patterns and amenity from the Scheme. Temporary diversions and construction phase traffic management details can be found in Appendix 12.2 (Population and Human Health Supplementary Information) of the ES Appendices [REP3-018](~~**TR010065/APP/6.3**~~). Information regarding the need for temporary diversions and closures of PRoW during construction of the Scheme is presented within the construction strategy contained in section 2.6 of Chapter 2 (The Scheme) of the ES [APP-046](~~**TR010065/APP/6.1**~~).

6.14.165 Following a review of site surveys, user counts and consultation with the public, stakeholders and user groups, the WCH design has been revised in a number of locations across the Scheme. The primary design improvements are summarised as follows:

- Improved connectivity from Winthorpe to Newark-on-Trent, across the widened A46 via new, at-grade crossing points at Brownhills junction and Winthorpe through-about

- Creation of a combined footway / cycle track 'circular' route between Brownhills junction and Winthorpe through-about which also provides improved access to Newark Showground
- Signalisation of additional crossing points on a number of junctions, including Cattle Market Roundabout and Winthorpe through-about
- Reduction of the north-south severance by providing a new crossing west of Friendly Farmer roundabout
- Retention of existing routes where possible. Where it is unsafe to retain a route, a suitable diversion will be provided.
- Localised maintenance and lighting improvements on existing routes
- New shared-use route adjacent to the widened A46 allowing improved connectivity to Newark Showground, as well as the opportunity for future development.

6.14.166 The Scheme also makes enhancements to WCH facilities in order to address historic severance issues, as per paragraphs 3.22 and 5.205 of the NPSNN. For example, historically there was a PRoW that ran north to south between Winthorpe and the Newark Showground. This has been severed by the existing A46 with FP2 ending at the northern boundary of the A46 and FP3 ending at the southern boundary. The Scheme would reconnect these two PRoWs via a new footway/cycleway that links with FP2 to the north and runs parallel to the proposed dual carriageway before crossing beneath it alongside the A1. On the south side of the new dual carriageway, it would cross the existing A46 via a new signalised crossing and join the existing PRoW network that provides a connection with FP3. The ends of FP2 and FP3 will be permanently stopped up where they would result in a 'dead end'.

6.14.167 A description of this and other WCH facilities to be delivered by the Scheme is included in Chapter 2 of the ES [APP-046](~~**TR010065/APP/6.1**~~). Further details are also set out in Chapter 3 of the Transport Assessment [APP-047](~~**TR010065/APP/7.5**~~). Chapter 12 (Population and Human Health) of the ES [REP3-011](~~**TR010065/APP/6.1**~~) concludes that the construction of the Scheme is likely to have a temporary Moderate Adverse (significant) effect on the affected WCH provision as a result of both permanent and temporary land take and reduced access during construction. Mitigation measures have also been included in the REAC which forms part of the First Iteration EMP [REP4-010057](~~**TR010065/APP/6.5**~~), to be developed into a Second Iteration EMP prior to construction commencing. The mitigation measures within the First Iteration EMP are secured and committed through Requirement 3 of the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~). The REAC refers to measures including "*All temporary diversions for WCH around the work site to be clearly signed, with alternative access arrangements maintained throughout the construction period, as required. WCH routes are to only be closed once diversions are in place or the new arrangement has been established. New or diverted*

WCH routes have been embedded into the Scheme design in operation". The REAC also refers to a Traffic Management Plan (TMP) that would be implemented during the construction phase of the Scheme, to ensure that access is maintained, and disruption is minimised as far as possible, which would be secured and committed through Requirement 11 of the draft DCO [REP4-003](~~**TR010065/APP/3.1**~~).

6.14.168 Overall, the Scheme aims to provide improvements to WCH facilities through safer, enhanced routes as described above. The Applicant considers these proposals represent proportionate measures to mitigate impacts on accessibility as far as is reasonably possible, as required by NPSNN paragraphs 5.215 and 5.216.

6.14.169 As mentioned above mitigation measures of relevance during construction are included or referenced within the First Iteration EMP [REP4-010](~~**TR010065/APP/6.5**~~). including the provision of appropriate signage for temporary WCH diversions, including wayfinding and duration of works. Mitigation measures during operation include the provision of appropriate signage for new or permanently diverted WCH routes. Consideration has also been given throughout the design development to any potential for enhancement opportunities in relation to population and human health and possible embedded mitigation including opportunities to rectify existing severance problems in the area and encourage greater use of WCH routes and access in and around proposed junctions to accommodate WCH as required.

6.14.170 Further information on the Scheme's compliance with the NPSNN can be found in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~).

6.15 Conformity of the Scheme with local development plans and local transport plans

6.15.1 To inform the decision process within an area, as well as form the basis for the determination of applications, Local Planning Authorities (LPAs) are responsible for producing a development plan consistent with the NPPF. The development plan should offer a series of strategic, as well as non-strategic policies which an application will need to demonstrate adherence with. If an application were to either conflict, contradict, or counter with the development plan, permission should be refused unless material consideration(s) indicate otherwise. This section therefore identifies the relevant strategic and local development plans that may be material considerations in the determination of the Scheme.

6.15.2 Newark and Sherwood District Council, and Nottinghamshire County Council, are the relevant LPAs in relation to the Scheme. Therefore,

the Scheme would be assessed in line with: Newark and Sherwood District Council Local Development Framework which is made up of:

- Amended Core Strategy Development Plan Document (DPD) (March 2019).
- Allocations and Development Management Development Plan Document (July 2013).
- Landscape Character Assessment SPD (Supplementary Planning Documents) (December 2013).

6.15.3 The following Nottinghamshire County Council Policy documents

- The Nottinghamshire Plan 2021-2031
- Nottinghamshire Local Transport Plan 2011 – 2026 (2011).
- Nottinghamshire Minerals Local Plan 2021

6.15.4 The Newark and Sherwood District Council cite the Scheme within the Amended Core Strategy DPD, as well as the Allocations and Development Management DPD. With reference to the economic provisions within Newark-On-Trent, Paragraph 4.23 of the Amended Core Strategy DPD states "*significant transport improvements will add to these assets, represented by the proposed dualling works to be undertaken to the A46 Newark Bypass*". Likewise, the Newark and Sherwood District Council will recommend "the implementation of strategic highway schemes" consistent with Policy NAP1: Newark Urban Area Section 4 of the Amended Core Strategy DPD.

6.15.5 The main Development Plan allocations and designations that overlap with the Order Limits comprise the following:

- Amended Core Strategy DPD Spatial Policy 7: Sustainable Transport;
- Amended Core Strategy DPD Core Policy 12: Biodiversity and Green Infrastructure;
- Allocations and Development Management DPD Policy DM7: Biodiversity and Green Infrastructure; and
- Allocations and Development Management DPD Policy NUA/OB/1: Newark Urban Area Open Breaks.

6.15.6 Further information on the relevant local development framework policies, allocations, and the Scheme's compliance with these policies will be discussed in the sections below.

Amended Core Strategy Development Plan Document

6.15.7 The Amended Core Strategy Development Plan Document outlines the fundamental issues that Newark and Sherwood District Council will need to consider, as well as resolve within the district through to 2033. The Amended Core Strategy DPD will contribute to the Newark and Sherwood District Council Local Development Framework (LDF), beside the Allocations and Development Management DPD. Newark and Sherwood District Council states "the LDF DPDs form the development plan for the area, and it will be used to shape decision

making by the District Council both in terms of investment and in the determining of planning applications."

6.15.8 Table 6-2: Amended Core Strategy DPD Policies sets out the relevant policies that need to be considered:

Table 6-2 Amended Core Strategy DPD Policies

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
Spatial Policy 1: Settlement Hierarchy	The Council will follow the Settlement Hierarchy. The Settlement Hierarchy will define the function associated with an area to deliver the Council's overall plan. The Council consider Newark to be located within the Sub-Regional Centre. The Sub-Regional Centre will be the core for investment within the District.	The Scheme provides transport infrastructure that will help support the delivery of planned growth within the Sub-Regional Centre of Newark. The Scheme would ease traffic flows on key junctions of the A46, increase capacity and reduce congestion as outlined in Chapter 4 of this Case for the Scheme and the TA [APP-193](~~**TR010064/APP/7.4**~~). This will help unlock investment summarised in Chapter 3 of this Case for the Scheme.
Spatial Policy 2: Spatial Distribution of Growth	The Council will labour beside various partners to secure investment within the Sub-Regional Centre for essential infrastructure, facilities, as well as services.	The Scheme provides transport infrastructure that will help support the delivery of planned new housing and employment growth within the Newark Urban Area. For example, a significant part of Newark's growth is focused on the Newark Business Park, but development of the Business Park is currently limited by highway problems and capacity issues which cause a bottleneck at Brownhills roundabout. There are also a number of housing Development sites which rely on the Scheme to achieve their full completion as detailed within Chapter 3 of this Case for the Scheme. This policy provides in principle

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		support for new infrastructure that will support such growth.
Spatial Policy 3: Rural Areas	The Council will account for the Location, Scale, Need, Impact, as well as Character within the determination of a Scheme within the rural areas.	This policy seeks to protect the character of rural areas within the District. Chapter 3 of this Case for the Scheme outlines the location, scale and need for the Scheme. Chapter 4 and 5 of this Case for the Scheme outline the impact of the Scheme as well as the benefits associated with it. Chapter 7 (Landscape and Visual) of the ES [APP-051]~~(TR010065/APP/6.1)~~ considers the likely significant effect of the Scheme in terms of landscape and visual impacts. This includes understanding the baseline landscape character of the study area, including more rural areas to the west of the A46. The assessment of change has subsequently informed Scheme design development, including embedded mitigation as well as essential mitigation via the provision of appropriate mitigation planting, such as hedgerows or woodlands, characteristic of the relevant policy zone through which the Scheme passes. Both embedded and essential mitigation seeks to reduce the impact of the Scheme on the receiving environment being mindful of local landscape character and key aspects that create the local sense of place.
Spatial Policy 5: Delivering	To ensure that the housing and	The Scheme provides transport infrastructure that will help support

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
the Strategy	employment needs of the District are delivered over the plan period, sufficient sites have been allocated to more than meet the requirements. The Council will support and encourage the delivery of allocated sites, helping to overcome constraints and unlock sites for development where appropriate.	the delivery of planned growth promoted by this policy. This is further set out in Chapter 3 and Chapter 4 of this Case for the Scheme which sets out the needs case for the Scheme both in the national and local context. The Core Strategy defines, in its Spatial Policy 5, five strategic sites, of which three are in Newark – land south of Newark, land east of Newark and land around Fernwood. These developments will provide 4,735 homes, concentrating most of Newark's growth. There are a number of housing development sites, which rely on the Scheme to achieve their full completion as detailed within Chapter 3 of this Case for the Scheme.
Spatial Policy 7: Sustainable Transport	The Council will be favour of the contribution to *'an improved and integrated transport network.'* The Council will recommend contribution toward 'the highway network in terms of the volume and nature of traffic generated, and ensure that the safety, convenience and free flow of traffic using the highway are not adversely affected' consistent with the Nottinghamshire Local Transport Plan.	This policy provides in principle support for the Scheme, as it represents infrastructure designed to support and improve the transport network within the District. As set out in Chapter 4 of this Case for the Scheme, the Scheme would be appropriate for the highway network by increasing the capacity of the SRN, reducing congestion and improving journey time reliability. Analysis of journey times indicate that the Scheme is likely to result in substantial improvements to journey times on the A46 in both directions between Lodge Lane and Brough

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		Lane in both 2028 and 2043. In 2043 there are forecast to be journey time savings of around seven minutes in each direction in the PM peak as a result of the Scheme. Further details are set out in the TA [APP-193](~~**TR010064/APP/7.4**~~). As set out in Chapter 4 of this Case for the Scheme, the Scheme would have an overall positive impact on safety. Analysis has been undertaken into the impacts of the Scheme on road safety in the local area and further afield. This included a COBALT (cost and benefit to accidents – light touch) assessment to understand the benefits the Scheme would bring in terms of the number and severity of casualties due to road accidents. Personal injury accident data has also been interrogated to consider whether there are any potential safety risks in the areas where the Scheme would increase traffic levels. The analysis concluded that the Scheme would have a positive impact on road safety. As set out in Chapter 4 of this Case for the Scheme, the Scheme provides facilities for cyclists, walkers and horse-riders where existing routes are affected and seeks to improve facilities for all users where practical, including addressing historical severance issues. For example, historically there was a PRoW that ran north to south between Winthorpe and the Newark Showground. This has

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		been severed by the existing A46 with FP2 ending at the northern boundary of the A46 and FP3 ending at the southern boundary. The Scheme would reconnect these two PRoWs via a new footway/cycleway that links with FP2 to the north and runs parallel to the proposed dual carriageway before crossing beneath it alongside the A1. On the south side of the new dual carriageway, it would cross the existing A46 via a new signalised crossing and join the existing PRoW network that provides a connection with FP3.
Core Policy 9: Sustainable Design	The Council will need 'new development proposals to demonstrate a high standard of sustainable design that both protects and enhances the natural environment and contributes to and sustains the rich local distinctiveness of the District'. 'Therefore, all new development should: • Achieve a high standard of sustainable design and layout that is capable of being accessible to all and of an appropriate form and scale to its context complementing the existing built and landscape environments.	The Applicant has prepared a Scheme Design Report [APP-194]~~(TR010065/APP/7.5)~~ which summarises the design policy context and which discusses the overarching design principles to respond to the design objectives set out in the NPSNN, The Road to Good Design, Design Principles for National Infrastructure, Technical Design Standards for the Scheme. The Scheme Design Report [APP-194]~~(TR010065/APP/7.6)~~ demonstrates how 'good design' was considered across the Scheme design and how this design minimises social and environmental impacts. Details on the embedded mitigation for the Scheme are captured in Chapter 2 (The Scheme) of the ES [APP-046]~~(TR010065/APP/6.1contained within Volume 6.1)~~. The Scheme design has been

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
	• Through its design, pro-actively manage surface water including, where feasible, the use of Sustainable Drainage Systems. • Minimise the production of waste and maximise its re-use and recycling. • Demonstrate an effective and efficient use of land that, where appropriate, promotes the re-use of previously developed land and that optimises site potential at a level suitable to local character. • Provide for development that proves to be resilient in the long-term. Taking into account the potential impacts of climate change and the varying needs of the community. • Take account of the need to reduce the opportunities for crime and the fear of crime, disorder and anti-social behaviour, and promote safe living environment.'	developed taking into account the potential implications of climate change such as resilience of the Scheme to flooding and high temperatures. The EIA process has considered the effects of possible future changes in climate over a 60-year appraisal period. The potential impacts of these climatic changes on the Scheme have been assessed in Chapter 14 (Climate) of the ES [APP-058]~~(TR010065/APP/6.1)~~. The drainage design has been developed taking into account future potential increases in flooding, while the impacts have been considered in the FRA in Appendix 13.2 of the ES Appendices [APP-177]~~(TR010065/APP/6.3)~~. Chapter 12 (Population and Health) of the ES [REP3-011]~~(TR010065/APP/6.1)~~ sets out the assessment methodology used to examine the effects of the Scheme on human health including accessibility. As outlined in the Drainage Strategy in Appendix 13.4 of the ES Appendices [APP-179]~~(TR010065/APP/6.3)~~, soft-engineering methods for drainage will be implemented where feasible, using Sustainable Drainage Systems (SuDS) as a primary principle to drain, treat and attenuate runoff, with nature-based solutions incorporated where achievable. The design and mitigation

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		measures outlined in Chapter 10 (Material Assets and Waste) of the ES [APP-054]~~(TR010065/APP/6.1)~~ will ensure the efficient use of material assets on site, the reuse of material is made a priority and recycled, or secondary material is used wherever technically appropriate and economically feasible.
Core Policy 10: Climate Change	The Council will remain *'committed to tackling the causes and impacts of climate change,'* as well as the reduction of carbon emission within the District. The Council will labour to *'mitigate the impacts of climate change through ensuring that new development proposals minimise their potential adverse environmental impacts during their construction and eventual operation.'*	Chapter 14 (Climate) of the ES [APP-058]~~(TR010065/APP/6.1)~~ provides an assessment of the likely significant effects of the Scheme on the climate. No significant effects on climate are anticipated. The assessment reviews the construction and the operation of the Scheme, and also sets out mitigation. Section 14.10 of Chapter 14 (Climate) of the ES [APP-058]~~(TR010065/APP/6.1~~outlines mitigation measures for both design and construction of the Scheme. Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-010]~~(TR010065/APP/6.5)~~ which will be developed into a Second Iteration EMP for implementation during construction of the Scheme. Mitigation measures have also been included in the Scheme construction to reduce impact, such as for example the pavement construction is planned to be undertaken in a more effective way than considered in earlier stages of the design development

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		to improve pavement durability. The construction method will be through paving in echelon. By running asphalt plant side by side, the entire surface will be laid in one to remove the longitudinal joints between lanes. Minimising joins reduces points of ingress for water and as such increases durability.
Core Policy 12: Biodiversity and Green Infrastructure	The Council will contend to *'conserve and enhance the biodiversity and geological diversity of the District.'*	Chapter 8 (Biodiversity) of the ES [APP-052]~~(TR010065/APP/6.1)~~ considers the likely significant effect of the Scheme on biodiversity and outlines measures to mitigate any unavoidable impacts. The habitat strategy is based on the principles of no net loss and has also achieved a net gain in habitats of biodiversity value, which are of benefit to a wide range of protected species. In the case of lowland meadow, a compensation strategy has been designed to address unavoidable losses to this very high distinctiveness habitat (as detailed in the Biodiversity Net Gain Technical Report Appendix 8.14 of the ES Appendices [APP-159]~~(TR010065//APP/6.3)~~. Mitigation measures are included within the First Iteration EMP [REP4-010]~~(TR010065/APP/6.5)~~. The First Iteration EMP will be developed into a Second Iteration EMP for implementation during construction of the Scheme. Measures include: • Use of best practice measures to minimise

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		impacts on mammals such as covering excavations over-night or securing mammals ladders within excavations. • Restriction of night working along the majority of the working width where possible, to minimise the requirement for artificial lighting to be used, thereby avoiding disturbance effects of artificial lighting on sensitive ecological features such as bats, badger, fish, otter and terrestrial invertebrates. Chapter 9 (Geology and Soils) of the ES [REP3-009]~~(TR010065/APP/6.1)~~ considers the likely significant effect of the Scheme on geology and soils. The assessment concludes for geology a neutral effect has been identified during construction due to the absence of designated or non-designated geological sites/features of interest within the study area.
Core Policy 13: Landscape Character	The Council will work to secure *'development which positively addresses the implications of relevant landscape Policy Zone(s) that is consistent with the landscape conservation and enhancement*.'	The Scheme complies with the equivalent policy requirements of the NPSNN, which sets out requirements for the assessment and mitigation of Landscape and Visual impacts of NSIPs. Chapter 6 of this Case for the Scheme and the response to NPSNN paragraphs 5.144 and 5.145 outlined in the NPSNN Accordance Tables [AS-090]

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		~~(TR010065/APP/7.2)~~ further explain how the Scheme is compliant with these requirements. Section 7.10 of Chapter 7 (Landscape and Visual Effects) of the ES [APP-051]~~(TR010065/APP/6.1)~~ outlines that enhancement measures seek to improve and/or restore local landscape character and visual amenity where possible, aligning with the Landscape Actions specified for the relevant policy zones established by the Newark and Sherwood Landscape Character Assessment SPD. Such as, enhancement of existing hedgerows within the Order Limits which would be undertaken where possible by means of coppicing, hedge laying or planting up gaps with native climate resilient species as appropriate.
Core Policy 14: Historic Environment	The Council will contend to secure *'continued conservation and enhancement of the character, appearance and setting of the District's heritage assets and historic environment'.*	The Scheme complies with the equivalent policy requirements of the NPSNN, which sets out requirements for the assessment and mitigation of heritage impacts of NSIPs. Chapter 3 of this Case for the Scheme and the response to NPSNN paragraphs 5.127, 5.131 and 5.133 outlined in the NPSNN Accordance Tables [AS-090]~~(TR010065/APP/7.2)~~ further explain how the Scheme is compliant with these requirements. An assessment of the value/sensitivity (significance) of heritage assets has been carried out in accordance with criteria set

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		out in Table 6-1 of Chapter 6 (Cultural Heritage) of the ES [APP-050]~~(TR010065/APP/6.1)~~ this also includes an assessment on impacts on any designated heritage assets including proposed mitigation measures. A total of 20 archaeological assets are identified as likely to experience significant adverse effects as a result of the construction of the Scheme, following archaeological excavation and recording. A total of 11 built heritage assets are identified as likely to experience significant adverse effects as a result of the construction of the Scheme as a result of changes to their setting, including visual or noise intrusions, or from the potential for direct impact as a result of vibration or ground settlement during construction. Chapter 6 (Cultural Heritage) of the ES [APP-050]~~(TR010065/APP/6.1)~~ section 6.1 sets out in detail the mitigation measures including embedded mitigation, considered through the design process. Embedded mitigation is further set out Chapter 2 (The Scheme) of the ES [APP-046]~~(TR010065/APP/6.1)~~. Mitigation measures of relevance during construction are included within the First Iteration EMP [REP4-010]~~(TR010065/APP/6.5)~~. Details on the First and Second

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
		Iteration EMPs, including how mitigation is secured by the draft DCO [REP4-003](~~TR010065/APP/3.1~~), is provided within section 4.4 of Chapter 4 (Environmental Assessment Methodology) of the ES [APP-048](~~TR010065/APP/6.1~~).The likely significant effects and mitigation requirements of the Scheme are summarised in Table 6-7 of Chapter 6 (Cultural Heritage) of the ES [APP-050](~~TR010065/APP/6.1~~). One built heritage asset is identified as being significantly adversely affected by the operation of the Scheme as a result of additional noise intrusion into their setting. This is MM053 Lowwood. Grade II listed. Chapter 11 Noise and Vibration [APP-055]~~(TR010065/APP/6.1)~~ has not identified the need for noise barriers to the A46 flyover or Brownhills roundabout. Without specific mitigation the indirect impact and risk of loss of historic fabric through replacement triple-glazed windows remains likely. The Scheme has been carefully designed, as described in Chapter 2 (The Scheme) of the ES [APP-046]~~(TR010065/APP/6.1)~~. The careful design and mitigation has minimised the overall heritage impact of the Scheme. It is considered that the benefits of the Scheme outweigh these effects, as per paragraphs 5.132 of the NPSNN.

Amended Core Strategy DPD policy	Content of policy	Compliance with policy
NAP1: Newark Urban Area	The Council will remain in favour of the implementation of core infrastructure, with reference to the *'A46 Link Capacity, Newark-on-Trent Bypass'.*	The Scheme is in compliance with this policy through the delivery of alterations to the existing infrastructure.

Allocations and Development Management Development Plan Document

6.15.9 The Allocations and Development Management Development Plan Document allocates sufficient land for residential, as well as commercial development to assist Newark and Sherwood District Council to deliver the Amended Core Strategy DPD. The Allocations and Development Management DPD contributes a series of 'Development Management' policies to offer direction, as well as "help deliver specific allocations and assist in the day-to-day assessment of planning applications". The Allocations and Development Management DPD contributes to the Newark and Sherwood District Council LDF, alongside the Amended Core Strategy DPD.

6.15.10 Table 6-3: Allocations and Development Management DPD Policies sets out the relevant policies that need to be considered.

Table 6-3 Allocations and Development Management DPD Policies

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
Policy DM5: Design	The Council will account for Access, Parking, Amenity, Local Distinctiveness and Character, Trees, Woodland, Biodiversity and Green Infrastructure, Crime and Disorder, Ecology, Unstable Land, Flood Risk and Water Management, as well as Advertisement within the determination of a scheme.	The Applicant has prepared a Scheme Design Report [APP-194]~~(TR010065/APP/7.5)~~ which summarises the design policy context and which discusses the overarching design principles to respond to the design objectives set out in the NPSNN and The Road to Good Design, Design Principles for National Infrastructure, Technical Design Standards for the Scheme. The Scheme Design Report [APP-194]~~(TR010065/APP/7.5)~~

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		demonstrates how 'good design' was considered across the Scheme design and how this design minimises social and environmental impacts.
Policy DM7: Biodiversity and Green Infrastructure	The Council will expect provisions on the protection, promotion, as well as enhancement of Green Infrastructure to *'deliver multi-functional benefits and contribute to the ecological network both as part of on-site development proposals and through off-site provision.'* The Council cannot authorise permission for '*proposals on, or affecting, Special Areas of Conservation or Special Protection Areas (European Sites) unless it is directly related to the management of the site for nature conservation.*'	Chapter 8 (Biodiversity) of the ES [APP-052~~]~~] ~~(TR010065/APP/6.1)~~ considers the likely significant effect of the Scheme on biodiversity and Section 8.10 outlines measures to mitigate any impacts. Embedded mitigation incorporated into the Scheme design development is also outlined in Chapter 2 (The Scheme) of the ES [APP-046~~]~~] ~~(TR010065/APP/6.1)~~. For example, mitigation measures include: • The Scheme has been designed to minimise habitat loss with a focus on avoiding high value and/or irreplaceable habitat present. All veteran trees within or in close proximity to the Order Limits have been retained. Habitats of principle importance and habitats of high distinctiveness (condition assessment for BNG) have been retained wherever possible. For example, attenuation ponds have been positioned to maximise retention of mature trees, hedgerows and habitat of principal importance.

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		• Habitat connectivity to the wider landscape has been maintained and enhanced wherever possible to maximise biodiversity opportunities within the Order Limits, particularly in respect to LWSs and priority habitats. • The BNG Technical Report in Appendix 8.14 of the ES Appendices [APP-159]~~(TR010065/APP/6.3)~~ assesses that the Scheme would result in a predicted net gain in biodiversity. The Habitats Regulations Assessment [REP3-024]~~(TR010065/APP/6.6)~~ is included within the DCO application. This considers whether the Scheme would result in significant effects on European sites of biodiversity interest. It is anticipated that the Scheme is likely to have a Slight Adverse effect on Humber Estuary SAC during construction. This is not considered to be a significant effect. Furthermore Chapter 7 (Landscape and Visual) of the ES [APP-051] ~~(TR010065/APP/6.1)~~ sets out the embedded mitigation that promotes green infrastructure. For example, mitigation measures include:

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		• New and replacement native planting which takes into account climate change resilience and reflects the local landscape character, including those species listed in the Newark and Sherwood Landscape Character Assessment SPD. Over time, this vegetation would mature to offer effective screening where required as well as general landscape integration and softening of built features. • Retention and strengthening of hedgerows and linear belts of vegetation along the highway boundary where possible, to ensure that existing field boundaries and highways planting remains intact and wildlife corridors are not severed. Where retention is not possible, new planting will be sought to restore continuity of existing vegetation. This would include areas of species rich grassland, scrub planting, hedgerows, hedgerows with trees, linear belts of tree and shrub planting and woodland, as well as wetland planting of drainage features. • Where drainage ditches, balancing ponds and

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		attenuation areas are required, opportunities for habitat creation have been incorporated into the environmental design with an aim to increase biodiversity.
Policy DM9: Protecting and Enhancing the Historic Environment	The Council will insist on historic environment-concerned development to *'secure their continued protection or enhancement,'* as well as *'contribute to the wider vitality, viability and regeneration of the areas in which they are located and reinforce a strong sense of place.*' The Council will enforce DM9: Protecting and Enhancing the Historic Environment in connection with either a Listed Building, a Conservation Area, Historic Landscapes, Archaeology, All Heritage Assets, or Shopfronts.	The Scheme complies with the equivalent policy requirements of the NPSNN, which sets out requirements for the assessment and mitigation of heritage impacts of NSIPs. Section 6.14 of this Case for the Scheme and the response to NPSNN paragraphs 5.127, 5.131 and 5.133 listed in the NPSNN Accordance Tables [AS-090](~~**TR010065/APP/7.2**~~) explain how the Scheme is compliant with these requirements. An assessment of the value/sensitivity (significance) of heritage assets has been carried out in accordance with criteria set out in Table 6-1 of Chapter 6 (Cultural Heritage) of the ES [APP-050](~~**TR010065/APP/6.1**~~) this also includes an assessment on impacts on any designated heritage assets including proposed mitigation measures. A total of 20 non designated archaeological assets are identified as likely to experience significant adverse effects as a result of the construction of the Scheme, following archaeological excavation and

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		recording. A total of 11 built heritage assets are identified as likely to experience significant adverse effects as a result of the construction of the Scheme as a result of changes to their setting, including visual or noise intrusions, or from the potential for direct impact as a result of vibration or ground settlement during construction, including 10 Grade II or Grade II* listed buildings and Winthorpe Conservation Area. One built heritage asset is identified as being significantly adversely affected by the operation of the Scheme as a result of additional noise intrusion into their setting. This is MM053 Lowwood. Grade II listed. Chapter 11 Noise and Vibration [APP-055] ~~(TR010065/APP/6.1)~~ has not identified the need for noise barriers to the A46 flyover or Brownhills roundabout. Without specific mitigation the indirect impact and risk of loss of historic fabric through replacement triple-glazed windows remains likely. The Scheme has been carefully designed, as described in Chapter 2 (The Scheme) of the ES [APP-046] ~~(TR010065/APP/6.1)~~. The careful design and mitigation has minimised the overall heritage impact of the Scheme.

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		For this reason, it is considered that the benefits of the Scheme outweigh these effects, as per paragraphs 5.132 of the NPSNN. There are no predicted significant effects on historic landscapes or shopfronts expected as a result of the operation of the Scheme.
Policy DM10: Pollution and Hazardous Materials	The Council recommend *'proposals involving hazardous materials or the potential for pollution should take account of and address their potential impacts in terms of health, the natural environment and general amenity.'* The Council will insist on the detriment to be '*balanced against the economic and wider social need.*' The Council will insist on reasonable *'mitigation as part of the development or through off-site measures'* if needed.	Chapter 5 (Air Quality) of the ES [AS-021](~~**TR010065/APP/6.1**~~) considers the likely significant effects of the scheme on air quality. The predicted effects from the operation of the scheme on local air quality at human health receptors is concluded to be not significant so no mitigation measures are proposed. Chapter 10 (Materials and Waste) of the ES [APP-054](~~**TR010065/APP/6.1**~~) outlines the volume of hazardous waste that may be generated by the Scheme is currently unknown. A Ground Investigation survey helped establish the potential for excavated materials to be classified as hazardous, particularly on the areas located near historical and permitted landfills. An initial Ground Investigation has identified one potential area which may contain contaminated material. Site testing will confirm the potential contamination in this area, however material in this

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
		area will be left undisturbed and in-situ; further details are contained in Chapter 9 Geology and Soils ~~(TR010065/APP/6.3)~~[REP3-009]. Therefore, contaminated excavated material is not anticipated to arise from the Scheme. A full Site Waste Management Plan (SWMP) will be prepared to ensure that waste is managed in accordance with the waste hierarchy and other relevant legislative requirements. In the event that hazardous waste arises, the SWMP procedures for handling and storing of this waste would be followed to ensure cross-contamination does not occur. The full SWMP will be developed based on the principles and mitigation detailed within the Outline SWMP in Appendix B of the First Iteration EMP ~~(TR010065/APP/6.5)~~[REP4-010].
Policy DM12: Presumption in Favour of Sustainable Development	The Council will follow the 'presumption in favour of sustainable development contained in the National Planning Policy Framework.' Where needed, the Council will labour to *'seek solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic,*	Section 6.2 of this Case for the Scheme outlines how the Scheme complies with the equivalent policy requirements of the NPSNN. The Scheme will fulfil the economic objective of sustainable development during the operational phase by increasing capacity and reducing congestion on the SRN, unlocking employment growth within Newark by

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
	social, and environmental conditions.'	facilitating the delivery of regional and local business developments. The Scheme will fulfil the social objective of sustainable development by supporting strong, vibrant and healthy communities. The Scheme will improve strategic and local connectivity in Newark-on-Trent and the wider area, unlocking housing growth. The Scheme will also improve facilities for WCH and other vulnerable users where existing routes are affected, reducing severance in the local area. The Scheme will fulfil the environmental objective of sustainable development by seeking to avoid or mitigate environmental effects. Measures incorporated to mitigate effects are extensive and are outlined in the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1). The Scheme would also achieve a net gain in biodiversity as set out in Appendix 8.14 of the ES Appendices [APP-159](~~**TR010065/APP/6.3**~~)**.**
Policy NUA/OB/1: Newark Urban Area – Open Breaks	To ensure existing settlements retain their separate identities and characteristics, this policy identifies the following areas that are under pressure for development which provide an open break between	Land around Brownhills junction and Farndon roundabout fall within this allocation. However, the Scheme is located on the edge of this allocation, and adjacent existing highway infrastructure and will not therefore impact the purpose of this policy.

Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
	settlements, and where planning permission will not normally be granted for built development: • Newark and Farndon; • Newark and Winthorpe; and • Newark and Coddington	The visual impacts of the Scheme have been assessed in Chapter 7 (Landscape and Visual Effects of the ES [APP-051](~~TR010065/APP/6.1~~).

Amended Allocations and Development Management Development Plan Document

6.15.11 Newark and Sherwood District Council published an Amended Allocations and Development Management DPD for a period of representation from 14 November 2022 to 9 January 2023, as part of their Plan Review.

6.15.12 Table 6-4 Amended Allocations and Development Management DPD Policies sets out the relevant policies that need to be considered.

Table 6-4 Amended Allocations and Development Management DPD Policies

Amended Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
Policy DM7: Biodiversity and Green Infrastructure	The Council state *'Development proposals in all areas of the District should seek to enhance biodiversity. Except for exempt development proposals, the enhancement should be a net gain of at least 10% (or if different, the relevant percentage set out in the Environment Act) as*	The BNG Technical Report in Appendix 8.14 of the ES Appendices [APP-159](~~TR010065/APP/6.3~~) assesses that the Scheme would result in a predicted net gain in biodiversity. This represents emerging local policy, therefore whilst it has been considered, the Scheme would not provide a net gain in

Amended Allocations and Development Management DPD Policy	Content of policy	Compliance with policy
	measured by the applicable DEFRA metric or any successor document. These gains must be guaranteed for a period of at least 30 years. On 9th November 2023 a two year transition period will end; after which biodiversity net gain of the relevant percentage becomes a legal requirement on developments where it is applicable.'	biodiversity of 10%. The Scheme is in accordance with NPSNN policies relating to biodiversity. There is also currently no requirement for NSIPs to deliver a net gain in biodiversity of 10% and this is expected to be the case until November 2025.

Landscape Character Assessment Supplementary Planning Document

6.15.13 The Landscape Character Assessment SPD (December 2013) offers an assessment of the various landscapes within the district. The Landscape Character Assessment SPD will be considered a material consideration. Chapter 4: The Trent Washlands Regional Character Area of the Landscape Character Assessment SPD covers the Scheme area.

6.15.14 Chapter 7 (Landscape and Visual) of the ES ~~(**TR010065/APP/6.1**)~~[APP-051] outlines mitigation measures, including those where the Newark and Sherwood Landscape Character Assessment SPD has been considered. For example, new and replacement native planting reflects the local landscape character, including those species listed in the Newark and Sherwood Landscape Character Assessment SPD.

6.15.15 Chapter 7 (Landscape and Visual Effects) of the ES ~~(**TR010065/APP/6.1**)~~[APP-051] outlines that enhancement measures seek to improve and/or restore local landscape character and visual amenity where possible, aligning with the Landscape Actions specified for the relevant policy zones established by the Newark and Sherwood Landscape Character Assessment SPD. Such as, enhancement of existing hedgerows within the Order Limits which would be undertaken where possible by means of coppicing, hedge laying or planting up gaps with native climate resilient species as appropriate.

Green Infrastructure Strategy for Newark & Sherwood

6.15.16 The strategy "will allow for the expansion of settlements whilst ensuring that the District, its assets and landscapes suffer no negative effects and instead prosper from new development". The need "to respond to the threats and challenges of climate change for communities and wildlife has also shaped the strategy's development".

6.15.17 Chapter 8 (Biodiversity) of the ES ~~(**TR010065/APP/6.1**)~~[APP-052] considers the likely significant effect of the Scheme on nationally and locally designated sites.

6.15.18 The BNG Technical Report in Appendix 8.14 of the ES Appendices [APP-159]~~(**TR010065/APP/6.3**)~~ assesses that the Scheme would result in a predicted net gain in biodiversity.

6.15.19 Chapter 7 (Landscape and Visual Effects) of the ES ~~(**TR010065/APP/6.1**)~~[APP-051], considers any likely significant effects of the Scheme upon landscape features. The assessment considers both construction and operational phase effects.

The Nottinghamshire Plan 2021-2031

6.15.20 The Nottinghamshire Plan 2021-2031 sets out Nottinghamshire County Council's (NCC) vision, *"A healthy, prosperous and greener future for everyone",* followed by four key ambitions for the duration of the plan being in place:

- improving health and wellbeing in all our communities
- growing our economy and improving living standards
- reducing the county's impact on the environment
- helping everyone access the best of Nottinghamshire.

6.15.21 The objectives of the Scheme support these ambitions with the Scheme aiming to accommodate economic growth and deliver better environmental outcomes for Newark-on-Trent and the wider area. This is demonstrated in Chapter 3 of this Case for the Scheme.

Nottinghamshire Local Transport Plan 2011-2026

6.15.22 The Nottinghamshire Local Transport Plan 2011-2026 (2011) details the transport strategy for the whole of the county of Nottinghamshire for the fifteen-year period 1 April 2011 to 31 March 2026.

6.15.23 Within the Nottinghamshire Local Transport Plan, Nottinghamshire County Council outline several aims:

- Provide a reliable, resilient transport system which supports a thriving economy and growth whilst encouraging sustainable and healthy travel.
- Improve access to key services, particularly enabling employment and training opportunities.
- Minimise the impacts of transport on people's lives, maximise opportunities to improve the environment and help tackle carbon emissions.

6.15.24 The Nottinghamshire Local Transport Plan describes the various measures to be delivered to enhance the provision of transportation within Nottinghamshire. The Implementation Plan will indicate the use of investment to deliver the Local Transport Plan Strategy.

6.15.25 About the condition of the route as well as the recurrence of excessive traffic, Section 3.2.2 of the Nottinghamshire Local Transport Plan observed the A46 route "*as having high daily stress (over 90%) levels".* Consistent with the Nottinghamshire Local Transport Plan, for *"between 90% and 100% stress, the link is approaching capacity and the traffic flows are susceptible to flow breakdown"*. Therefore, the Nottinghamshire Local Transport Plan includes mention of the recommended *"improvement works along the A46 between Saxondale and Newark".*

6.15.26 The objectives of the Scheme align with the spatial and strategic transport goals of the Nottinghamshire Local Transport Plan. The Scheme aims to enable economic growth, improve safety and journey times, deliver better environmental outcomes and be inclusive and support all user groups and modes. This is demonstrated in Chapter 3 of this Case for the Scheme.

Nottinghamshire Minerals Local Plan 2021

6.15.27 The council adopted the Minerals Local Plan on 25 March 2021. The Nottinghamshire Minerals Local Plan forms the land use planning strategy for mineral development within the County up to 2036. It provides the basis for the determination of mineral planning applications within the County. Its over-arching theme is the promotion of sustainable development and achieving the highest quality restoration possible. The Minerals Local Plan includes specific policy in relation to borrow pits and states in paragraph 5.148 *"The term 'borrow pit' is applied to a temporary mineral working supplying material for use solely in a specific construction project, particularly roads"*

6.15.28 Policy DM15 of the Minerals Local Plan states proposals for borrow pits will be supported where:

"a) They are adjacent to or close to the project/s they are intended to serve;
b) They are time limited to the life of the project and material is to be used only for the specified project;
c) They can be worked and reclaimed without any unacceptable environmental impacts;
d) There are overriding environmental or other benefits compared to obtaining materials from alternative sources;
e) Proposals provide for appropriate restoration measures which include full use of surplus spoil from the project."

6.15.29 The majority of materials needed on the Scheme comprise primary material as the Scheme is unlikely to be able to source all requirement materials from recycled/secondary materials. Borrow pits within the Order Limits have been identified and would be used, where possible, to minimise the import of materials to the Scheme. Potentially three borrow pits would be formed:

- Farndon West, to the north of the River Trent.
- Farndon East, to the north of the River Trent.
- Brownhills junction.

6.15.30 These locations have been selected due to their proximity to where material would be needed during the construction phase, and to minimise the distance over which material would need to be transported.

6.15.31 The topsoil excavated from the borrow pit areas would be either stockpiled adjacent to the area or transported to the soil stockpile areas at the northern end of the Scheme. The topsoil would be used for re-soiling after completion of the works. Settlement and recharge lagoons would be constructed adjacent to the borrow pit areas to allow dewatering operations to take place.

6.15.32 The excavated material would be cleaned and graded to a specified material classification on site. This would be loaded onto wagons to be taken to the required fill locations.

6.15.33 Material excavated from the Farndon sites is likely to be sands and gravels and would be processed into a class 6i/j material for use in the reinforced earth soil embankment between the River Trent and the Nottingham to Lincoln railway line in Section 1.

6.15.34 Material excavated from the Brownhills site is likely to be a class 2 clay. This would be used to construct the new embankment at Brownhills junction.

6.15.35 After completion of the extraction of the material, the excavations at Brownhills borrow pit would be backfilled and re-soiled. Farndon West borrow pit site would be profiled to suit the essential mitigation shown on Figure 2.3 Environmental Masterplan of the ES Figures ~~(TR010065/APP/6.2)~~[AS-026]. It is likely that there would be no surplus material to backfill the borrow pit at Farndon East, and it is likely this would be left to naturally fill with water over time. For the purposes of the environmental assessment, it has been assumed that there would be no surplus material to backfill Farndon East.

6.15.36 All suitable excavated material would be reused in the construction of the Scheme and in landscaping features along the A46, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site. Where site won material is not available or suitable for reuse, secondary or recycled materials would be procured where available.

6.15.37 On this basis the use of borrow pits is seen to in conformity with Policy DM15 of the Minerals Local Plan. The use of borrow pits would help reduce the impacts during construction, avoiding heavy traffic on the wider road network, and delivering significant economic, carbon and energy savings due to the reduced haulage costs. In addition, the sites help to deliver environmental benefit through the creation of mitigation areas set out above. Further details on the environmental assessment of the proposed borrow pits is set out in Chapter 10 (Materials and Waste) of the ES ~~(**TR010065/APP/6.1**)~~[APP-054].

6.15.38 Policy SP7: Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure of the Minerals Local Plan states:

”1. *Locally and nationally important mineral resources, permitted reserves, allocated sites and associated minerals infrastructure will be safeguarded from needless sterilisation by non-minerals development through the designation of minerals safeguarding areas as identified on the Policies Map.*

2. Non-minerals development within minerals safeguarding areas will have to demonstrate that mineral resources will not be needlessly sterilised as a result of the development and that the development would not pose a serious hindrance to future extraction in the vicinity.

3. *Where this cannot be demonstrated, and where there is a clear and demonstrable need for the non-minerals development, prior extraction will be sought where practicable”.*

6.15.39 Paragraph 3.84 of the Minerals Local Plan with regard to Minerals Safeguarding Areas states:

“Not every non-mineral development proposal within or close to a Minerals Safeguarding and Consultation Areas represents a risk to future minerals extraction. The main risks will arise from proposals to extend built up areas and new development in the open countryside, as such; the following categories of development are exempt from both consultation and safeguarding:

- *Development which is in accordance with adopted District/Borough Local Plan allocations which took account of minerals sterilisation and where prior extraction is not feasible or appropriate;*
- *Temporary development;*
- *Householder planning applications (except for new dwellings);*
- *All applications for advertisements;*
- *Infill development;*
- *Reserved matters; and*
- *Prior notifications (telecoms, forestry, agriculture, demolition.”*

6.15.40 Paragraph 3.87 states:

"It is accepted that there may be circumstances where prior extraction may not be appropriate. In these cases, the County Council would expect the developer to demonstrate that:

- *The mineral concerned is no longer of any value or potential value; or*
- *There is an overriding need for the non-mineral development which outweighs the need for the mineral; or*
- *The proposed non-minerals development site is located on the urban fringe and mineral extraction would be inappropriate in this location; or*
- *The non-mineral development is of a minor nature as defined by the exemption criteria in paragraph 3.80."*

6.15.41 Data and information in the baseline study (Section 10.8) of Chapter 10 (Materials and Waste) of the ES ~~(**TR010065/APP/6.1**)~~[APP-054] has indicated that there is one Minerals Safeguarding Area (MSA) for sand and gravel within the study area; and there are no peat resources.

6.15.42 The Scheme is not likely to represent a risk to the MSA and prior extraction from the MSA may not be appropriate. Taking into consideration the below points, the Scheme is anticipated to lie within the considerations and circumstances stated in paragraphs 3.84 and 3.87 of the Nottinghamshire Minerals Local Plan above.

- The Scheme is not a new development in an open countryside area, as the works at the Scheme are related to the improvement and widening of a section of the existing A46 road.
- The A46 forms part of the strategic Trans-Midlands Trade Corridor between the M5 in the south-west and the Humber Ports in the north-east.
- The improvements to the A46 corridor are detailed within the RIS2 as a mechanism for underpinning the wider economic transformation of the country.
- The size of the MSA is significantly greater than the size of the Scheme (refer Figure 10.2 Material Assets and Waste Management Second Study Area in the ES Figures ~~(**TR010065/APP/6.2**)~~[AS-054]. The total area for the sand and gravel MSA within Nottinghamshire is over 377 square kilometres, while the total area of the Scheme within the MSA is approximately 1.8 square kilometre; which represents approximately 0.48 percent of the MSA area.

6.15.43 Although the Scheme lies within considerations as stated in the Nottinghamshire Minerals Local Plan, SP7, due to the reasons outlined, the Scheme only covers approximately 0.48% of the total MSA area and the Scheme development is unlikely to represent a risk to the MSA. Therefore, it is considered that the Scheme is unlikely to sterilise MSA and/or peat resources.

7 Planning Balance

7.1.1 The analysis of the planning policy above demonstrates that there is a compelling need for the Scheme identified within national policy through the NPSNN and RIS2.

7.1.2 The NPSNN places a strong emphasis on the need to improve and integrate the SRN and the Scheme would deliver against this national objective.

7.1.3 RIS2 highlights the importance of the A46 in connecting the Midlands and identifies the opportunity for improvements to the A46 at Newark-on-Trent to contribute towards the creation of a coast-to coast highway without the need for major new roadbuilding.

7.1.4 The A46 at Newark-on-Trent currently has the worst performance of any section of the A46 between Leicester and Lincoln. Between Cattle Market roundabout and the A1/A46 junction is a heavily congested stretch of single carriageway meaning that journeys on the A46 are unreliable, with congestion issues negatively impacting upon the wider Newark-on-Trent area.

7.1.5 The national and local need for the Scheme and the benefits it can bring are demonstrated in Chapter 3, Chapter 4 and Chapter 5 of this Case for the Scheme. Traffic modelling shows the Scheme is expected to increase capacity and reduce congestion on the SRN, resulting in a reduction in journey times and an increase in long distance traffic on the A46. The Scheme will also have a positive impact on road safety.

7.1.6 Further details on the analysis undertaken into the impacts of the Scheme on road safety in the local area and further afield including the COBALT (cost and benefit to accidents – light touch) assessment can be found in Chapter 8 (Road Safety) of the TA ~~(**TR010065/APP/7.4**)~~[APP-193].

7.1.7 The Applicant considers that the Scheme represents sustainable development in accordance with the NPPF, as demonstrated in Chapter 6 of this Case for the Scheme.

7.1.8 The local development plan provides support for the Scheme as a strategic highway scheme. The Scheme is considered to be in accordance with local planning and transport policy as demonstrated in Chapter 6 of this Case for the Scheme.

7.1.9 The Scheme has been carefully designed and the Applicant has taken great care to develop the design of the Scheme to avoid sensitive areas and limit adverse impacts where possible. An assessment of the environmental effects of the proposed scheme has been carried out and documented within the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1) and summarised within the Non-Technical Summary ~~(**TR010065/APP/6.4**)~~[REP3-020]. As noted in Chapter 16 (Summary of

ES) (~~**TR010065/APP/6.1**~~contained within Volume 6.1) there are a number of significant residual effects that are expected as a result of the proposed scheme.

7.1.10 Overall, whist it has not been possible to avoid all impacts, when considered against the 'assessment principles' and 'generic impacts' from the NPSNN, the benefits of the Scheme have been shown to outweigh the impacts, as described in Chapter 3, 4, 5 and 6 of this Case for the Scheme and in the NPSNN Accordance Tables (~~**TR010065/APP/7.2**~~)[AS-090].

7.1.11 Furthermore, measures to mitigate the effects of the Scheme have been considered throughout the design process. Mitigation includes both embedded and essential mitigation measures. Embedded mitigation measures are detailed within Section 2.5 of Chapter 2 of the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1). Essential mitigation has also then been identified and included within the topic chapters (Chapters 5 to 15) of the ES (~~**TR010065/APP/6.1**~~contained within Volume 6.1). Mitigation measures have also been included in the Register of Environmental Actions and Commitments (REAC) which forms part of the First EMP (~~**TR010065/APP/6.5**~~)[REP4-010], to be developed into a Second Iteration EMP prior to construction commencing. The mitigation measures within the First Iteration EMP are secured and committed through Requirement 3 of the draft DCO (~~**TR010065/APP/3.1**~~)[REP4-003]. No part of the development is to commence until the Second Iteration for that part, substantially in accordance with the First Iteration EMP, has been submitted to and approved by the Secretary of State.

7.1.12 Following completion of construction of the authorised development the Third Iteration EMP will be submitted to and approved by the Secretary of State, this is secured and committed through Requirement 4 of the draft DCO (~~**TR010065/APP/3.1**~~)[REP4-003] Figure 2.3 Environmental Masterplan of the ES Figures (~~**TR010065/APP/6.2**~~){AS-026] also depicts the environmental mitigation included as part of the design. Compliance with the principles of the Environmental Masterplan is secured by Requirement 12 of the draft DCO (~~**TR010065/APP/3.1**~~)[REP4-003].

7.1.13 An assessment of the Scheme in relation to the draft NPSNN (~~**TR010065/APP/7.3**~~[REP2-023]) is also provided. Although this is not yet designated it may still be an important and relevant consideration for the Secretary of State when determining whether to consent the DCO for this Scheme.

8 Conclusions

8.1.1 The NPSNN and RIS2 strongly support the delivery of national networks that meet the country's long-term needs, whilst helping to facilitate a prosperous and competitive economy and improving the quality of life for all.

8.1.2 The A46 is part of the England's SRN. The majority of the route is built to dual carriageway standard between Leicester and Lincoln, with the exception being the single carriageway section around Newark-on-Trent.

- Nationally, the A46 is important because it links the ports of the Humber and large urban areas between the Humber and Bristol. It is a key export corridor, with 22% of the goods and services produced along the corridor sold abroad.
- Regionally it serves as a key bypass/ring road for cities such as Coventry, Lincoln and Leicester, moving goods and people.
- In the Newark-on-Trent area it is an important link to the A1 and the M1.

8.1.3 The A46 at Newark-on-Trent currently has the worst performance of any section of the A46 between Leicester and Lincoln, and congestion issues negatively impact upon the wider Newark-on-Trent area.

8.1.4 The Scheme will deliver extensive benefits in terms of addressing the identified highways issues. In particular it will deliver the benefits summarised below:

- Boost business productivity and economic growth by providing a more reliable road network and improved local access.
- A comparison of junction performance, with and without the Scheme, indicates that the Cattle Market roundabout is forecast to experience a substantial level of improvement as a result of the Scheme in both 2028 and 2043. All other junctions are forecast to continue to operate well within capacity as a result of the Scheme.
- The A46 through Newark-on-Trent is already heavily congested at peak times and without improvement, congestion on the A46 will become increasingly worse.
- The TA ~~(**TR010065/APP/7.4**)~~[APP-193] identifies that the Scheme would alleviate the existing and potential future issues with congestion on the section of the A46 through Newark-on-Trent, help to reduce accidents, reduce journey times and create additional capacity to support future growth.

8.1.5 Overall, the Scheme is expected to increase capacity, reduce delays and incidents, improve journey times. and therefore, Improve resilience on the network. The benefits are further summarised in Chapters 3, 4 and 5 of this Case for the Scheme.

8.1.6 This Case for the Scheme has considered the compliance of the Scheme with relevant planning policy. There is significant policy

support for the Scheme in the NPSNN, which forms the primary basis against which the Scheme must be assessed. The NPSNN places a strong emphasis on the need to improve and integrate the strategic highway network and the Scheme would deliver against this national objective. The NPSNN Accordance Tables ~~(**TR010065/APP/7.2**)~~[AS-090] demonstrate the Scheme's conformity with the NPSNN. The Scheme has also had regard to all other important and relevant policy which needs to be taken into consideration, including the relevant adopted local development plan summarised in Section 6.15 of this Case for the Scheme. This is further summarised in Chapter 6 of this Case for the Scheme.

8.1.7 The Applicant has taken great care to develop the design of the Scheme to avoid sensitive areas and limit adverse impacts where possible. Extensive embedded mitigation and essential mitigation has also been set out in the ES and relevant topic chapters (~~**TR010065/APP/6.1**~~contained within Volume 6.1).

8.1.8 The 2008 Act requires that applications for development consent be decided in accordance with relevant NPS (Section 104(3)) except to the extent that the adverse impact of the Scheme would outweigh its benefits (Section 104(7)). It is not considered that there are any adverse effects that would outweigh the benefits of the Scheme and none of the other exceptions in this Section apply. Therefore, considering this and the extensive mitigation proposals and comprehensive pack of information submitted with this draft DCO ~~(**TR010065/APP/3.1**)~~[REP4-003] it is considered that development consent should be granted.

Glossary and Abbreviations

Term	Acronym or abbreviation	Definition
The 2004 Act		The Planning and Compulsory Purchase Act 2004.
The 2008 Act		The Planning Act 2008.
A46 Traffic Model	A46TM	Traffic modelling suite used to assess the impact of the Scheme. Comprises a Highway Assignment Model, Variable Demand Model and microsimulation model.
Affected Road Network	ARN	Parts of the road network which are identified as likely to be affected by changes in air quality as a result of a project. These comprise all roads that trigger the traffic screening criteria and adjoining roads within 200m.
Agricultural Land Classification	ALC	The system devised and introduced by the Ministry of Agriculture, Fisheries and Food to classify agricultural land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. Land is graded between 1 (excellent quality) to 5 (very poor quality), with grade 3 subdivided into agricultural subgrades 3a and 3b.
Air quality objective		Objectives are policy targets generally expressed as a maximum ambient pollutant concentration to be achieved. The objectives are set out in the UK Government's Air Quality Strategy for the key air pollutants.
Ancient woodland		Any area that has been continually wooded since at least 1600 AD and has developed irreplaceable, complex ecosystems.
Annual Average Daily Flows	AADF	The average over a full year of the number of vehicles passing a point in the road network each day.
Annual Average Daily Traffic	AADT	The total volume of vehicle traffic of a motorway or road for a year divided by 365 days.
The Applicant		National Highways.
Arboricultural Impact Assessment	AIA	A document submitted as part of the application for development consent that details existing tree constraints and trees/areas of arboricultural significance using available tree survey data with the information used to help minimise and/or avoid impacts on trees.
At-grade		On the same level. For example, when a road is on the current ground level.
Base year		The outputs of the traffic model coinciding with the year the traffic data was collected.
Benefit to Cost Ratio	BCR	The benefit cost ratio is a presentation of the amount of benefit being bought for every £1 of cost to the public purse – the higher the BCR the greater the benefit for every £1 spent.
Best and most versatile land	BMV	Land defined as grades 1, 2 and 3a of the Agricultural Land Classification. This land is considered the most flexible, productive and

Term	Acronym or abbreviation	Definition
		efficient and is most capable of delivering crops for food and non-food uses.
Biodiversity		The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part of. This includes diversity within species, between species and of ecosystems.
Biodiversity Net Gain	BNG	An approach that aims to leave biodiversity within the natural environment in a measurably better state than its condition prior to implementation of a project.
Borrow pit		An excavated area where material has been dug for use as fill at another location.
Bund		An embankment that acts as a visual or noise screen, or acts as a barrier to control the spillage of fluids.
Bypass		The diversion of a major road to carry traffic around a built-up area, constructed to improve the journey of through traffic and/or improve the environmental conditions along the original route.
Carbon Reduction Plan	CRP	A plan that outlines the strategies for the Crown Commercial Service's ongoing commitment to the management and reduction of our business-related carbon emissions.
Case for the Scheme	Case for the Scheme	This document.
Climate		Long-term weather conditions prevailing over a region.
Climate change		This refers to a change in the state of the climate, which can be identified by changes in average climate characteristics which persist for an extended period, typically decades or longer.
Closed-circuit Television	CCTV	A type of video surveillance.
Congestion		A situation where the volume of traffic is too great for the road, causing vehicles to slow down or stop, often caused by bottlenecks, traffic incidents and junction design.
Conservation area		An area designated under section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990 as being of special architectural or historic interest and with a character or appearance that is desirable to preserve or enhance.
Consultation Report		The Report which sets out how the Applicant has complied with the consultation requirements of the Planning Act 2008 and how the Applicant has had regard to the responses received.
Cost and Benefit to Accidents – Light Touch	COBALT	COBALT software undertakes the analysis of the impact on accidents as part of the economic appraisal for a road scheme, in accordance with the Department for Transport's Transport Analysis Guidance.

Term	Acronym or abbreviation	Definition
Crown Commercial Service	CCS	The biggest public procurement organisation in the UK.
Cultural heritage		Historic monuments, historic groups of buildings and/or historic sites.
Culvert		A tunnel (pipe or box shaped) that carries a stream or open drain under a road or railway.
D2N2		Derby, Derbyshire, Nottingham, Nottinghamshire Local Enterprise Partnership (LEP).
Development Plan Document	DPD	Planning policy documents that are part of the Newark & Sherwood District Council Allocations & Development Management Plan. These documents contribute to guiding development within the relevant authority area.
Department for Transport	DfT	The national Government body responsible for transport in Britain, and therefore in overall control of the road network. It is responsible for policy decisions, and its responsibilities are carried out by a range of agencies and local authorities.
Department for Transport's Transport Analysis Framework	TAG	A framework for options appraisal used by National Highways.
Development Consent Order	DCO	The consent for a Nationally Significant Infrastructure Project required under the Planning Act 2008.
Design Manual for Roads and Bridges	DMRB	The Design Manual for Roads and Bridges contains information about current standards relating to the design, assessment and operation of motorway and all-purpose trunk roads in England.
Desk-Based Assessment	DBA	A document prepared to provide a detailed assessment of the cultural heritage resource and sensitivities within the Order Limits of the Scheme and explores the potential effects the Scheme may have upon this resource.
Development plan		Documentation which that seeks to guide development and planning in a local authority area for a set period.
Development Plan Document	DPD	Planning policy documents that are part of the Newark & Sherwood District Council Allocations & Development Management Plan. These documents contribute to guiding development within the relevant authority area.
Do Minimum	DM	The conditions that would persist in the absence of the implementation of a construction or improvement project but on the basis that maintenance on the road network is ongoing.
Do Something	DS	The conditions that would occur as a consequence the implementation of a construction or improvement project.
Dust		All airborne particulate matter.
Early Assessment and Sifting Tool	EAST	A DfT tool developed to quickly summarise and present evidence on options in a clear and consistent format, to provide decision-makers with comparative evidence on how they perform.

Term	Acronym or abbreviation	Definition
Earthworks		The removal or placement of soils and rocks such as in cuttings, embankments and environmental mitigation, including the in-situ improvement of soils/rocks to achieve the desired properties.
East Coast Main Line		A 393-mile long major railway between London and Edinburgh via Peterborough, Doncaster, York, Darlington, Durham and Newcastle.
Embedded mitigation		Design measures that are integrated into the Scheme for the purpose of minimising environmental effects.
Enterprise Zone	EZ	Designated areas across England that provide tax breaks and Government support.
Environment Agency	EA	Government agency established to protect and improve the environment and contribute to sustainable development in England. Responsibilities include: water quality and resources, flooding and coastal risk management and contaminated land.
Environmental Management Plan	EMP	A site specific plan developed to ensure that a project is implemented in an environmentally sustainable manner where all contractors and subcontractors, including consultants, understand the environmental constraints within the site.
Environmental Assessment Report	EAR	A process by which information about environmental effects is collected, assessed, and used to inform decision-making.
Environmental Impact Assessment	EIA	The statutory process through which the likely significant effects of a development project on the environment are identified and assessed.
Environmental Statement	ES	A statutory document which reports the EIA process, produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Essential Mitigation		Mitigation required to offset the impacts as a result of construction and operation of the Scheme, which is secured through a Development Consent Order.
First Iteration Environmental Management Plan		The First Iteration of the Environmental Management Plan produced to set out mitigation measures and other commitments. This document **(TR010065/APP/6.5)** is submitted with the Development Consent application.
Floodplain Compensation Area	FCA	Areas of land set aside to mitigate for the loss of floodplain as a result of the Scheme.
Flood Risk		A combination of the probability (likelihood or chance) of a flood event happening, and the consequences (impact) if it occurred.
Flood Risk Assessment	FRA	The process of assessing potential flood risk to a site and identifying whether there are any flooding or surface water management issues that may warrant further consideration or may affect the feasibility of the Scheme.
Flood Zone 1		Land outside the floodplain where there is little or no risk of flooding.

Term	Acronym or abbreviation	Definition
Flood Zone 2		The area of the floodplain where there is a low to medium flood risk.
Flood Zone 3		The area of the floodplain where there is a high risk of flooding.
Floodplain		Land adjacent to a watercourse over which water flows or would flow in times of flood, but for defences in place.
Fluvial		A term that relates to rivers and streams and the processes that occur within them.
Geology		The physical structure, substance and history of the earth (rocks and minerals).
Government Net Zero Strategy	GNZS	A strategy that sets out policies and proposals for decarbonising all sectors of the UK economy to meet the government's net zero target by 2050.
Grade separated		A type of junction where the major route (or routes) through the junction do not stop and do not cross any other road on the level. Movements to other roads are made using slip roads and bridges.
Great Crested Newt	GCN	A newt in the family Salamandridae, found across Europe and parts of Asia, which are protected under the Conservation of Habitats and Species Regulations 2017.
Green Belt		A designation for land around certain cities and large built-up areas, which aims to keep this land permanently open or largely undeveloped.
Greenhouse gases	GHG	Atmospheric gases that absorb and emit infrared radiation emitted by the Earth's surface, the atmosphere and clouds.
Ground investigation	GI	An intrusive investigation undertaken to collect information relating to the ground conditions, normally for geotechnical or land contamination purposes.
Gross Value Added	GVA	A measure of the total value of goods and services produced in an economy.
Groundwater		Water found underground in porous geological strata and soils.
Habitat		The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.
Habitat of principal importance	HPI	Habitats in England identified as requiring action in the UK Biodiversity Action Plan and are regarded as having biodiversity conservation priorities.
Habitats Regulations Assessment	HRA	An assessment of *'projects'* (or plans) potentially affecting European Sites in the UK, required under the Habitats Directive and Regulations. Also known as an assessment of implications on European Sites.
Heritage Asset		A building, monument, site, place, area or landscape of historic value.
Historic England		Executive non-departmental public body created under section 32 of the National Heritage Act 1983 to:

Term	Acronym or abbreviation	Definition
		a. secure the preservation of ancient monuments and historic buildings situated in England; b. promote the preservation and enhancement of the character and appearance of conservation areas situated in England; and c. promote the public's enjoyment of, and advance their knowledge of, ancient monuments and historic buildings situated in England and their preservation.
Historic Environment Record	HER	A record of all known archaeological finds and features and historic buildings and historic/landscape features, relating to all periods from the earliest human activity to the present day; maintained by each County and Unitary Authority in the United Kingdom.
Infrastructure Delivery Plan	IDP	Newark and Sherwood Infrastructure Delivery Plan.
Junction		A place where two roads meet, regardless of design or layout.
Key Performance Indicator	KPI	Critical quantifiable indicators of progress towards a result.
Land Use		What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.
Landscape		An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.
Landscape and Ecology Management Plan	LEMP	Is a site-specific document, which details immediate and long-term commitments to manage the planting, protection and enhancement of biodiversity in and around a new development site.
Landscape Character Area	LCA	Areas of landscape that have a broadly consistent pattern of topography, land use and vegetation cover.
Landscape and Visual Impact Assessment	LVIA	A tool used to identify and assess the significance of and the effects of change resulting from a development on both the landscape as a resource and on people's views and visual amenity.
Levelling Up Fund	LUF	A £4.8 billion government fund to invest in infrastructure that improves everyday life across the UK.
Limits of Deviation	LoD	The maximum lateral and vertical extents within which the Scheme can be built. These are defined in the Development Consent Order.
Listed building		A building of special architectural or historic interest. Listed buildings are graded I, II* or II, with Grade I being as the highest. Listing includes the interior, as well as the exterior, of the building.
Local Development Framework	LDF	Documentation which that seeks to guide development and planning in a local authority area for a set period.

Term	Acronym or abbreviation	Definition
Local Enterprise Partnership	LEP	Partnerships between local authorities and businesses. They decide what the priorities should be for investment in roads, buildings and facilities in the area
Local Planning Authority	LPA	The body empowered by law to exercise planning functions.
Local Wildlife Site	LWS	Non-statutory sites of nature conservation value that have been designated 'locally'. These sites are referred to differently between counties with common terms including site of importance for nature conservation, county wildlife site, site of biological importance, site of local importance and sites of metropolitan importance.
Midland Regional Transport Model	MRTM2	The modelling for the Scheme is based on this model. MRTM2 is one of five Regional Transport Models used to assess programme level strategies across regions and provide a starting point for the development of detailed proposed scheme specific models, where networks, volumetric counts and availability of travel demand data can reduce the trafficking modelling programme.
Mineral safeguarding areas	MSA	Areas defined by mineral planning authorities with known mineral resources that are of identified economic or conservation value.
Mitigation		Measures intended to avoid, reduce and, where possible, remedy significant adverse environmental effects as the result of the Scheme.
Monitoring		An assessment of the performance of the Scheme, including mitigation measures. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted.
Motorway		A special type of road reserved for motorised traffic only, the numbers of which are prefixed with the letter ‘M’.
National Cycle Network	NCN	A national cycling route network of the United Kingdom, which was established to encourage cycling throughout Britain, as well as for the purposes of bicycle touring.
National Heritage List for England	NHLE	A database of designated heritage assets.
Nationally Significant Infrastructure Project	NSIP	Nationally Significant Infrastructure Project, further defined within Chapter 1 of this Case for the Scheme.
Mineral Safeguarding Area		An area of proven mineral resource that is considered to be of sufficient economic or conservation importance to warrant long term protection
National Infrastructure Delivery Plan	NIDP	A plan that sets out how the government will support the delivery of infrastructure projects and programmes.
National Planning Policy Framework	NPPF	A planning framework which sets out the Government's planning policies for England and

Term	Acronym or abbreviation	Definition
		how these are expected to be applied.
National Policy Statements	NPS	Statements produced by the government. They give reasons for the policy set out in the statement, and must include an explanation of how the policy takes account of government policy relating to the mitigation of, and adaptation to, climate change.
National Policy Statement for England	NPSE	Statements prepared and designated by the Secretary of State under the Planning Act 2008, which establish national policy for Nationally Significant Infrastructure Projects, including energy, transport and water, waste water and waste and against which applications for Development Consent Orders are assessed.
National Policy Statement for National Networks	NPSNN	A statement setting out the need for, and the Government's policies to deliver, the development of Nationally Significant Infrastructure Projects on the national road and rail networks in England.
Natural England	NE	Executive non-departmental public body constituted under the Natural Environment and Rural Communities Act 2006 (section 2(1)) to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.
Newark and Sherwood District Council	NSDC	The local authority within whose jurisdiction the Scheme is to be implemented.
Noise		Unwanted sound.
Noise barrier		Fence placed between a road and a noise sensitive receptor to reduce noise levels. Includes all elements of the fence (posts and fixings, as well as panels).
Noise Important Area	NIA	Areas identified with respect to noise from major roads and from roads within agglomerations where 'the 1% of the population that are affected by the highest noise levels from major roads' are located according to the results of the strategic noise mapping.
Nottinghamshire County Council	NCC	The county authority within whose jurisdiction the Scheme would be implemented.
Operational		The functioning of the Scheme on completion of construction.
Order Limits		The extent of the area within which the Scheme may be carried out.
Outcome Delivery Plan	ODP	A plan that sets out how a government department is working towards the delivery of its priority outcomes.
Outline Site Waste Management Plan	OSWMP	Identifies the strategic approach for the management of waste generated during the construction phase of the Scheme.
Personal Injury Accident	PIA	Road accidents reported to the police where at least one person was injured.
Preferred Option		The chosen design option that most successfully achieves the Scheme objectives and becomes

Term	Acronym or abbreviation	Definition
		subject to further design and assessment.
Preferred Route Announcement	PRA	An announcement made by National Highways following the selection of a preferred option or solution for a road scheme.
Principal Contractor		A person or organisation responsible for the overall management of a construction project, particularly when there is more than one contractor involved in a project.
Protected Species		Species of wild plants, birds and animals that are afforded protection through legislative provisions.
Public right of way	PRoW	A highway where the public has the right to pass. It can be a footpath (used for walking), a bridleway (used for walking, riding a horse and cycling), or a byway that is open to all traffic (including motor vehicles).
Queues and Delays During Roadworks	QUADRO	A program designed to assess the total economic cost of roadworks associated with a transport scheme.
Regional Character Areas	RCA	Different character areas within Newark & Sherwood Landscape Character Assessment SPD.
Remediation (contaminated land)		The process of removing a pollution linkage (i.e. by removing one or more of the elements in a source – - pathway – y-receptor linkage) in contaminated land in order to render an acceptable risk. Usually this involves a degree of removal of contaminants and/ or blockage of pathways.
Road Investment Strategy	RIS	A document which sets a long-term strategic vision for the network. With that vision in mind, it then: specifies the performance standards Highways England must meet; lists planned enhancement schemes we expect to be built; and states the funding that we will make available during the first Road Period (RP), covering the financial years 2015/16 to 2019/20.
Road Investment Strategy 2	RIS2	A document which sets a long-term strategic vision for the network. With that vision in mind, it then: specifies the performance standards Highways England must meet; lists planned enhancement schemes we expect to be built; and states the funding that we will make available during the second Road Period (RP2), covering the financial years 2020/21 to 2024/25.
Road Safety Audit 1	RSA1	There are four stages of a Road Safety Audit (RSA). Stage 1 RSAs are undertaken at the completion of preliminary design and normally before planning consent is granted.
Roundabout		A circular, one-way junction at which other roads meet and terminate.
Runoff		The flow of water over the ground surface.
Scoping		The process of identifying the issues to be addressed by the Environmental Impact Assessment process. It is a method of ensuring that an assessment focuses on the important

Term	Acronym or abbreviation	Definition
		issues and avoids those that are considered insignificant.
Scoping Opinion		The written opinion of the relevant authority, following a request from the Applicant, as to the information to be provided in an Environmental Statement.
Scoping Report		A report that records the outcomes of the scoping process and is typically submitted as part of a formal request for a Scoping Opinion.
Screening		The formal process undertaken to determine whether it is necessary to carry out a statutory Environmental Impact Assessment and publish an Environmental Statement in accordance with the EIA Regulations.
Second Iteration Environmental Management Plan		The second iteration of the Environmental Management Plan, which is refined for the construction stage of the consented project and prepared in advance of construction.
Severance (walkers, cyclists and horse riders)		The extent to which members of communities are able (or not able) to move around their community and access services/facilities.
Significance (of effect)		A measure of the importance or gravity of the environmental effect, defined by generic significance criteria or criteria specific to an environmental topic.
Simulation and Assignment of Traffic to Urban Road Networks	SATURN	SATURN is a powerful and flexible highway assignment software package.
The Scheme		The A46 Newark Bypass Scheme for which development consent is being sought.
Significant Observed Adverse Effect Level	SOAEL	The level above which significant adverse effects on health and quality of life occur.
Site of Special Scientific Interest	SSSI	Area of land notified by Natural England under section 28 of the Wildlife and Countryside Act 1981 as being of special interest due to its flora, fauna or geological or physiological features.
Site Waste Management Plan	SWMP	A plan that is used to outline how a construction project would avoid, minimise or mitigate effects on waste production and handling on the environment and surrounding area.
Soil		An assemblage of mineral particles and/or organic matter, which includes variable amounts of water and air (and sometimes other gases).
Soils Management Plan	SMP	A document that provides a framework that can be used by contractors to manage and monitor the soils disturbed during the construction phase of the Scheme.
Southern Link Road	SLR	A road scheme that would be delivered by Newark and Sherwood District Council to connect the A1 to the A46 to ease congestion on existing routes through Newark, with an expected completion by Spring 2025.
Special Area of Conservation	SAC	Sites designated under EU legislation for the protection of habitats and species considered to

Term	Acronym or abbreviation	Definition
		be of European interest.
Stakeholder		An organisation or individual with a particular interest in the Scheme.
Strategic Road Network	SRN	The network of motorways and trunk roads in England.
Supplementary Planning Document	SPD	Documents not part of a development plan for a particular authority area that provide additional guidance or detail on policies within the development plan and are a material consideration for an LPA in their decision-making.
Sustainable Drainage System	SuDS	Techniques for managing water runoff to reduce the quantity, and increase the quality, of surface water that drains from a development.
Targeted consultation		Following the statutory consultation, the Applicant undertook targeted non-statutory consultation as a result of updates to the proposal in six areas of the Scheme. This targeted non-statutory consultation was held to seek views and allow an opportunity for prescribed consultees, persons with land interests and community stakeholders, who the Applicant considered would be impacted by, , and interested in, the Scheme, to comment on the updates.
Throughabout		A road junction consisting of a main road that goes through the middle of a roundabout.
Tonnes of carbon dioxide equivalent	tCO2e	A measure that allows the different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO2.
Transport Analysis Guidance	TAG	Guidance produced by the Department for Transport for undertaking transportation studies, appraisals and modelling. Also referred to as WebTAG.
Transport Decarbonisation Plan	TDP	A plan that sets out the government's commitments and the actions needed to decarbonise the entire transport system in the UK.
Transport User Benefit Appraisal	TUBA	A type of software that undertakes the economic appraisal of transport schemes in accordance with DfT's TAG.
Traffic Management Plan	TMP	A document that sets out how construction traffic including site personnel movements will be controlled to ensure the safe and efficient delivery of the Scheme.
Variable Demand Model	VDM	Used to predict the future levels of demand for private vehicle travel, taking into account trip generation, distribution and mode split.
Value for Money	VfM	An assessment that takes into consideration both the monetised and unmonetised benefits and costs of the Scheme.
Veteran Tree		Trees that have features of ancientness but at a younger age. These features include missing branches, hollow trunks and habitat features more commonly associated with ancient trees.
Visual Receptor		Individuals and/or defined groups of people who potentially could be affected by the Scheme.
Walkers, cyclists	WCH	A collective term used to describe pedestrians,

Term	Acronym or abbreviation	Definition
and horse-riders		cyclists and equestrians.
Water Framework Directive	WFD	A European Union Directive which commits member states to achieve good status of all waterbodies (both surface and groundwater), and also requires that no such waterbodies experience deterioration in status. Good status is a function of good ecological and good chemical status, defined by a number of elements.
Wider Impacts in Transport Appraisal	WITA	A type of software that captures the welfare impacts of employment, investment and productivity effects that are not already included in the conventional user benefit calculations for transport schemes.