

A46 Newark Bypass

Scheme Number: TR010065

6.1 Environmental Statement

Chapter 3 Assessment of Alternatives

APFP Regulation 5(2)(a)

Planning Act 2008

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

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

The A46 Newark Bypass
Development Consent Order 202[#]

6.1 Environmental Statement

Chapter 3 Assessment of Alternatives

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3 Assessment of Alternatives

3.1 Introduction

- 3.1.1 Regulation 14(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017¹ (the EIA Regulations) requires, “a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects”. This demonstrates the rationale and decisions made for the final preliminary design to be submitted as part of the development consent application, as further detailed in paragraphs 4.20 in the 2024 NPSNN and 4.26 in relation to the 2015 NPSNN.
- 3.1.2 The National Policy Statement for National Networks (NPSNN)² sets out the policy which the Scheme should comply with. It is also the basis for informing a judgement on the impacts of a Scheme, for example whether the Scheme is consistent with the requirements of the NPSNN. Paragraph 4.27 of the 2015 NPSNN requires that “All projects should be subject to an options appraisal. The appraisal should consider viable modal alternatives and may also consider other options (in light of the paragraphs 3.23 to 3.27 of this NPS). Where projects have been subject to full options appraisal in achieving their status within Road or Rail Investment Strategies or other appropriate policies or investment plans, option testing need not be considered by the examining authority or the decision maker. For national road and rail Schemes, proportionate option consideration of alternatives will have been undertaken as part of the investment decision making process. It is not necessary for the Examining Authority and the decision maker to reconsider this process, but they should be satisfied that this assessment has been undertaken”.
- 3.1.3 At the time of the DCO application submission in April 2024, a draft revised NPSNN had been published³. The DCO application was accepted for examination on 23 May 2024 and the 2024 NPSNN was subsequently designated on 24 May 2024. Paragraph 4.18 of the draft 2024 NPSNN and paragraph 4.21 of the designated 2024 NPSNN requires that “National road or rail schemes that have been identified in relevant Road or Rail Investment Strategies will have been subject

¹ Statutory Instrument (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, No. 527.

² Department for Transport (2014) National Policy Statement for National Networks [online] available at: [National policy statement for national networks - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/281112/national-policy-statement-for-national-networks.pdf) (last accessed December 2023).

³ Department for Transport (2023) Draft Revised National Networks National Policy Statement [online] available at: [Draft revised national networks national policy statement - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/118111/draft-revised-national-networks-national-policy-statement.pdf) (last accessed December 2023).

to an options appraisal process where relevant in line with existing Transport Appraisal Guidance, and proportionate consideration of alternatives will have been undertaken as part of the investment decision making process. The options appraisal may include other viable options for achieving the objectives of the project, including (where appropriate) other modes of travel, regulation, or other ways of influencing behaviour in line with Department for Transport guidance. The Examining Authority and the Secretary of State should satisfy themselves that the options appraisal process has been undertaken.”

- 3.1.4 The application for development consent for the Scheme was accepted for examination on 23 May 2024. As set out in the transitional provisions of the 2024 NPSNN (paragraphs 1.16 and 1.17), the 2015 NPSNN has effect for any application for development consent accepted for examination prior to 24 May 2024 and will inform decisions made by the Secretary of State in relation to those applications. However, it is noted that the 2024 NPSNN may still be an important consideration for the Secretary of State for Transport when determining whether to consent the DCO for this Scheme.
- 3.1.5 Evidence demonstrating compliance of the Scheme with the 2015 NPSNN, the draft revised 2024 NPSNN and the final designated 2024 NPSNN has been provided within the Case for the Scheme [REP5-030], NPSNN (2015) Accordance Tables [REP6-016], the Draft NPSNN (2024) Accordance Tables [APP-192] and the NPSNN (2024) Accordance Tables [REP5-032].
- 3.1.6 The Scheme has progressed through Strategy, Shaping and Prioritisation (which identifies and prioritises potential transport issues); Option Identification and; Option Selection stages and is currently at the end of the Preliminary Design stage. During the earlier stages a number of alternatives were considered and appraised, progressing from corridor identification and sifting, and route option identification and sifting. Design alternatives have been further considered during the preliminary design development of the preferred route.

3.2 Assessment methodology

- 3.2.1 This section outlines the process and tools used during the option identification and assessment process. The findings and assessment conclusions of each stage of the process are detailed within Section 3.3 of this Chapter.
- 3.2.2 The Scheme has been subject to a process of staged development following identification of the need case in 2014. This has involved the identification, appraisal and evaluation of different options, which have led to the preliminary design submitted as part of the development consent application in February 2024.

3.2.3 In summary, the main development stages have been:

- Identification of the need case (2014).
- Initial options identification and assessment – corridor and route sifting (2015).
- Options development, shortlisting and assessment (2016 – 2020).
- Options consultation (2020-2021).
- Option selection and development following Options consultation (2021-2022).
- Preferred route announcement (2022) followed by Statutory Consultation (2022).
- Design changes following Statutory Consultation (2022) and Statutory and Non-Statutory Targeted Consultations (2023) leading to the preliminary design (2022 – 2023).

3.2.4 The Scheme development process has been informed by the requirements of legislation and policy (as detailed in Section 3.1), consultation with stakeholders and the general public, and iterative environmental assessment. These have collectively influenced:

- The identification and evaluation of different options for the Scheme.
- The selection of a preferred option and its subsequent refinement to optimise the design and reduce, where practicable, the likely significant environmental effects of the Scheme.
- The planned approach to the construction, delivery, maintenance and long-term management of the Scheme.

3.2.5 A number of tools and approaches have been used during the Scheme development process. These include:

- The development of assessment criteria informed by:
 - Scheme objectives
 - NPSNN requirements
 - DfT's Early Assessment and Sifting Tool (EAST)

3.2.6 Iterative environmental assessment and environmental appraisal at each stage in line with relevant policies, legislative and standards including the 2015 NPSNN, EIA Regulations, and Design Manual for Roads and Bridges (DMRB).

3.3 Reasonable alternatives studied

Early Scheme history

3.3.1 The Scheme (then termed 'A46 Newark Northern Bypass Scheme') was included in the Government's Autumn Statement 2014.

- 3.3.2 In 2014, possible solutions for the Scheme were identified by the Applicant through collating evidence relating to network performance issues and engaging with local stakeholders. From this, the Applicant recommended dualling and bypass solutions, further outlined in the Options Summary Report⁴, which fed into DfT's RIS and National Highways' Delivery Plan.
- 3.3.3 The Department for Transport's (DfT) Road Investment Strategy (RIS) was published in March 2015. National Highways' Delivery Plan (DP) and DfT's RIS announced two different solutions for the Scheme to be developed in RIS1 (2015-2020) and delivered in RIS2 (2020-2025).
- 3.3.4 National Highways' DP stated "*A46/A616/A167 and A46/A1 junctions – improvements to create smooth running of the Newark bypass and to support planned growth in the region. Options will include use of technology to provide better information and promote greater network resilience*".
- 3.3.5 DfT's RIS stated "*Widening of the A46 north of Newark to dual carriageway, raising the last section of the A46 between the A1 to M1 to Expressway standard. Improvement of the A46/A1 junction to allow for better traffic movement to Newark and Lincoln*".
- 3.3.6 In 2016 the DP 2016-17 Update expanded the commitment to "*We will work to develop Midlands Connect's priority strategic roads schemes and this includes development work on 4 major roads ... improvements to the A46 Newark bypass and its junction with the A1 in Nottinghamshire*".
- 3.3.7 The RIS recommended option identification and assessment to be undertaken, commencing with the Strategy, Shaping and Prioritisation stage.

Strategy, Shaping and Prioritisation stage

- 3.3.8 The RIS aspiration was developed through the Strategy, Shaping and Prioritisation stage work into an emerging recommended solution for: full dualling between Farndon Roundabout and Winthorpe Roundabout; an improved grade separated layout at Cattle Market Roundabout; and a grade separated bypass over the A1 to the north of the A1/A46 junction; through to Winthorpe Roundabout.
- 3.3.9 The initial corridor sifting commenced during the Strategy, Shaping and Prioritisation stage, identifying a total of three potential corridor options; Corridors A, B and C. These corridors were considered and assessed against the Scheme objectives, 2015 NPSNN and DfT's Early Assessment and Sifting Tool + (EAST+).

⁴ National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](https://www.nationalhighways.gov.uk/consultations/2020/a46-newark-bypass-options-summary-report) (last accessed December 2023).

Option Identification stage

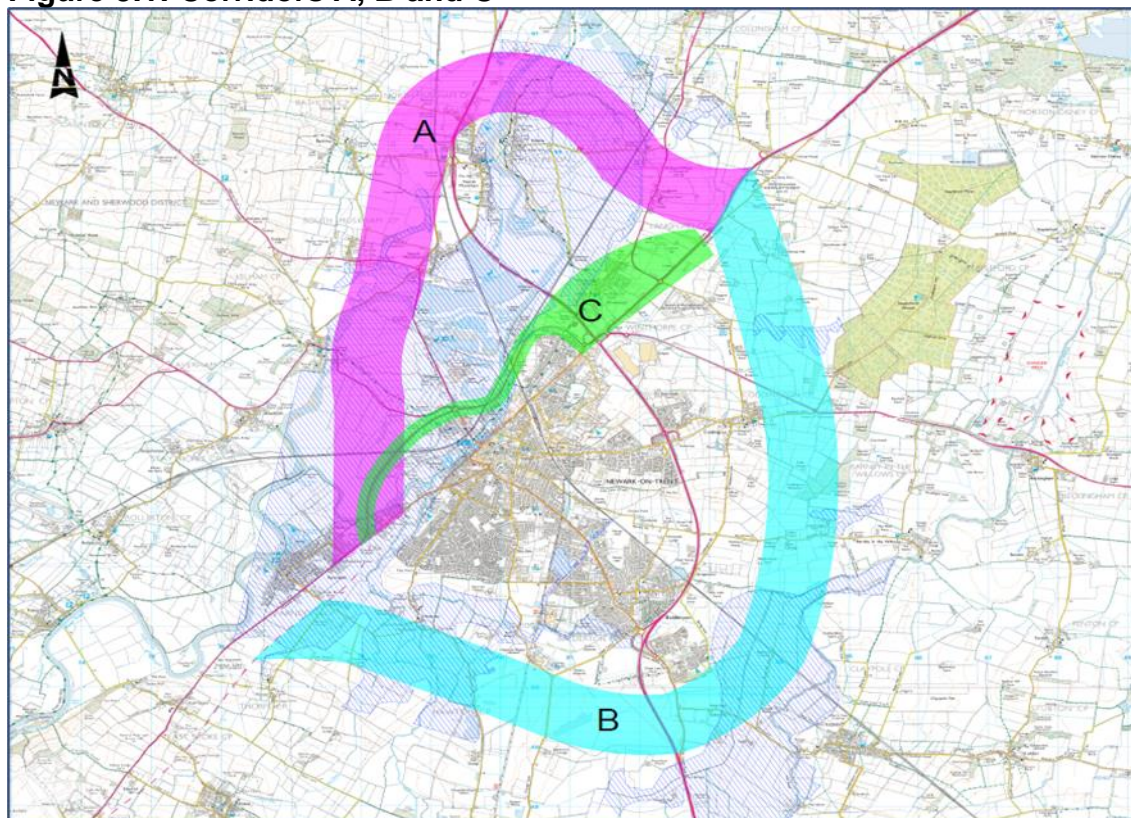
Introduction

- 3.3.10 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 these corridors passing the Design Fix A gateway. This stage 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.
 - The development of corridors and the subsequent process to assess and sift them, in preparation for the development of route options, is described below.

Corridor Identification and Sifting (Design Fix A)

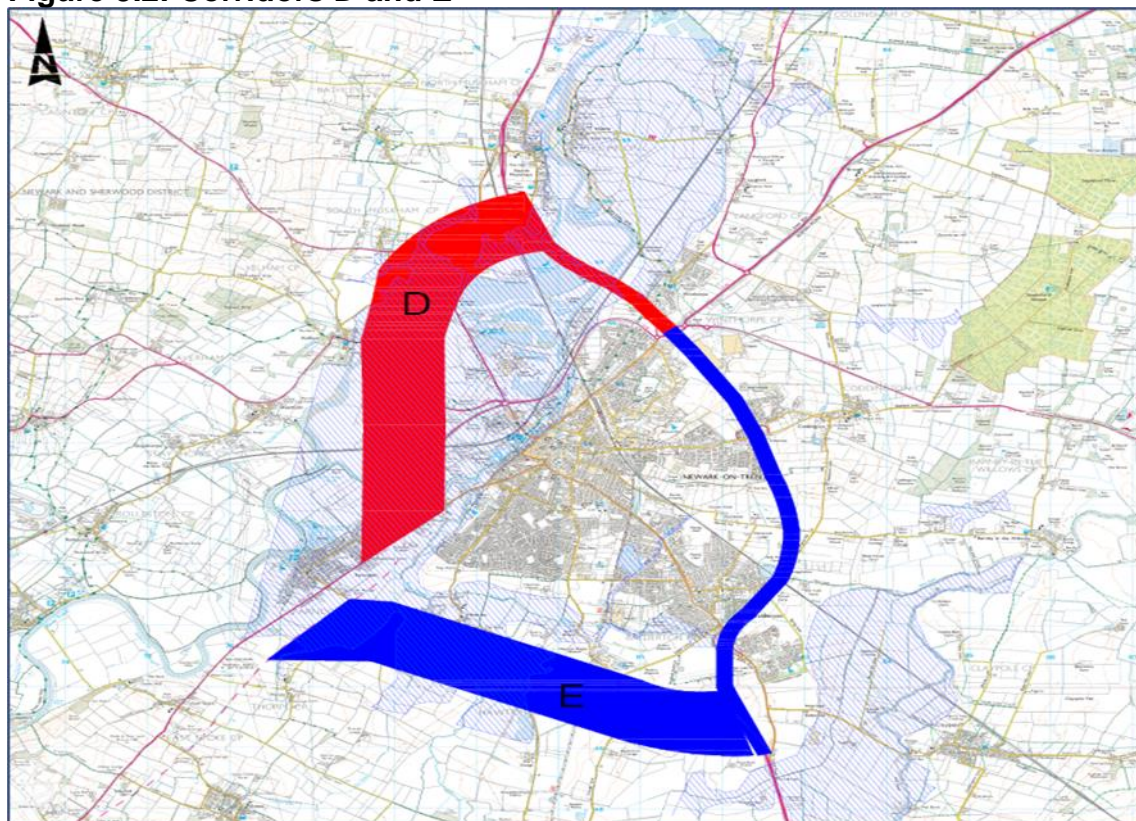
- 3.3.11 At the options identification stage for the Scheme, a further two corridor options were identified, termed Corridor D and E, in addition to Corridors A, B and C that were identified during the Strategy, Shaping and Prioritisation stage. Therefore, five potential corridor options were identified to ensure a wide range of possibilities were considered.
- 3.3.12 Figure 3.1 below shows the geographical locations of Corridors A, B and C. Figure 3.2 shows Corridors D and E. Detailed descriptions of Corridors A-E are provided in Table 3-1.

Figure 3.1: Corridors A, B and C



Source: National Highways (2020)

Figure 3.2: Corridors D and E



Source: National Highways (2020)

Table 3-1: Corridor Descriptions

Corridor	Description
A	Starts south-west of Newark-on-Trent, diverging towards west of Newark-on-Trent, cuts across the railway line, crosses the River Trent, bypasses South and North Muskham, crossing A1 road, 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 A1 road, 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 A1 road 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 A1 road near Fernwood, further follows the existing A1 road and re-joining the existing A46 near Winthorpe Junction.

- 3.3.13 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.
- 3.3.14 Each corridor was assessed against the Scheme objectives and the 2015 NPSNN. Furthermore, the Department for Transport's (DfT) EAST was used as an assessment tool in the assessment process. Details of each are contained below:

Scheme objectives:

3.3.15 Safety:

- Improve safety of the A46 and its junctions, reducing the frequency and severity of incidents along the A46.

3.3.16 Congestion:

- Reduce congestion along the A46 and its junctions.
- Improve links to the A1 by removing A46 through-traffic from the A1/A46 Junction.
- Improve journey times and journey time reliability along the A46 and its junctions between Farndon and Winthorpe.
 - Support the movement of goods and access to transport hubs along the A46 corridor including the Humber Ports and East Midlands Airport.
 - Improve accessibility to Newark-on-Trent and the local area.
 - Enabling economic growth and development in Newark-on-Trent, Nottinghamshire and Lincolnshire.

3.3.17 Resilience:

- Increase resilience of the A46 by providing two lanes in each direction separated by a central reserve barrier.
- Increase resilience of the wider Strategic Road Network (for example, A1 and M1) by providing a more suitable alternative route when incidents occur.

3.3.18 Environment:

- Improve noise levels in Noise Important Areas ('noise hotspots') affected by improvements to the A46.
- Deliver better environmental outcomes through mitigation, protection and enhancement, and contribute to biodiversity.

3.3.19 Customer:

- Seek to improve the customer experience and satisfaction of all customers affected by the Scheme.
- Maintain and improve facilities for cyclists, walkers and horse riders where existing facilities are affected.

3.3.20 A qualitative assessment of the degree of fit with each of the Scheme objectives was undertaken. For each corridor, the Scheme objectives criteria was scored against the 5-point scale set out in EAST (described further in paragraph 3.3.37 below), as shown in Table 3-2 below.

Table 3-2: Five-point scoring scale against the Scheme objectives

Numerical Scoring	Colour Code	Assessment
1		There is significant conflict with other policies/options affecting the study area which needs to be resolved. Possibly also conflicts with other modes.
2		There is some conflict with other policies/options or modes.
3		Overall, the option fits well with other policies affecting the study area.
4		The option fits very well with other policies affecting the study area.
5		Option complements other policies/proposals affecting study area, has no negative impacts on other modes or outcomes and demonstrates 'doing more with less'.

Source: National Highways (2019)

3.3.21 The results of the assessment against the Scheme objectives are summarised in Table 3-3 below. The overall score for the corridors was determined by considering each of the criteria separately, as opposed to taking an average value for each corridor. This ensured that the overall scores accounted for any substantial deviations from the criteria, especially those that scored 1.

Table 3-3: Results of assessment against the Scheme objectives

Client Scheme Requirement	Corridor A	Corridor B	Corridor C	Corridor D	Corridor E
Economic Growth	1	2	4	3	2
Movement	1	2	4	3	3
Accessibility	1	2	4	1	2
Journey Time	1	2	4	1	1
Safety	2	2	3	3	3
Resilience	3	3	4	3	3
Environment	1	1	2	1	1
Customer	2	2	3	2	2
Overall Scheme Objectives Assessment	1	2	3	1	1

Source: National Highways (2019)

- 3.3.22 Corridor C, the most direct route, using the existing A46 corridor, scored highest for economic growth, movement, accessibility, journey time, resilience, customer groups and environment.
- 3.3.23 The risk of potential negative impacts on environmental receptors and the potential for environmental improvements provided by the corridor options were assessed.
- 3.3.24 Regarding noise, Corridor C would provide a limited opportunity to improve six out of the nine Noise Important Areas (NIA) along the A46 corridor and had the potential to bring road traffic noise, without mitigation, closer to the properties alongside the existing A46 at Newark-on-Trent. Alternatively, Corridors B and D would provide improvements to approximately 50% of the total NIAs in those corridors while improvements would be provided to less than six of the 13 NIAs in Corridor A and 2 of out 12 NIAs in Corridor E.
- 3.3.25 Corridor C generated the least amount of carbon emissions overall due to the shortest route length. Due to its convenience, the route itself may have experienced greater traffic volumes and emissions compared to Corridors A, B, D and E. However, Corridor C would have resulted in lower overall emissions when considering the wider baseline road network.
- 3.3.26 To conclude, Corridor C performed better than Corridors A, B, D and E regarding carbon, noise and the local water environment. However, there would still have been the requirement to improve performance during option development and reduce the risk of adverse effects on environmental receptors.

Environmental criteria and the NPSNN

- 3.3.27 The 2015 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.
- 3.3.28 The thresholds for nationally significant road, rail and strategic rail freight infrastructure projects are defined in the Planning Act 2008 (the 2008 Act).
- 3.3.29 The 2015 NPSNN provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State for Transport.
- 3.3.30 The 2015 NPSNN is directly relevant to highway infrastructure schemes on the national road network that are defined as an NSIP. As part of the Options Identification stage, the Scheme was considered to fall within the definitions of an NSIP under section 14(1)(h) and section 22(1)(b) of the Planning Act 2008. The 2015

NPSNN is therefore the primary planning policy against which an application for development consent for the Scheme would be judged.

- 3.3.31 An assessment of potential impacts was undertaken for each topic by technical specialists based primarily on the presence or absence of a receptor within, or in proximity to, each corridor option. The environmental aspects assessed included: historic environment, biodiversity, air quality, noise, landscape and visual, water, geology, soils and materials, people and communities and climate.
- 3.3.32 A 5-point scale, defined by technical specialists, was adopted for the assessment of corridor options against each environmental topic. The 5-point scale provided an indication of the level of environmental risk or benefit associated with a corridor, based on the likelihood of impacts to high value receptors and the number of receptors likely to be affected. The 5-point scale is set out in Table 3-4 below.
- 3.3.33 Once assessed against each environmental topic, the corridor options were given an overall score. This assessment contributes to the EAST+ methodology and is demonstrated in Table 3-4.

Table 3-4: Five-point scoring scale for NSPNN Criteria

Numerical Scoring	Colour Code	Assessment	Scale
1		Moderate - high level of risk of an adverse impact to high value / sensitivity designations or receptors; or for adverse impacts on a moderate - large number of sensitive receptors within the route corridor	Very Poor
2		Low-moderate level of risk of an adverse impact to high value / sensitivity designations or receptors; or for adverse impacts on a low- moderate number of sensitive receptors within the route corridor	Poor
3		Neutral or limited effects or a low level of risk of an adverse impact to high value / sensitivity designations or receptors; or a limited number of sensitive receptors within the route corridor	Neutral
4		Potential for beneficial effects or enhancements to high value / sensitivity designations or receptors; or for beneficial effects to a low - moderate number of sensitive receptors within the route corridor	Good
5		Potential for substantial beneficial effects or enhancements (inbuilt as part of the Scheme) to high value / sensitivity designations or receptors; or for beneficial effects to a moderate - large number of sensitive receptors within the route corridor	Very good

Source: National Highways (2019)

The DfT's Early Assessment and Siting Tool (EAST) which includes environmental criteria⁵

- 3.3.34 Web-based Transport Analysis Guidance (WebTAG) is the DfT's transport appraisal guidance and toolkit and is a requirement for all interventions that require governmental approval. It provides guidance on transport modelling and appraisal methods that are applicable for highways and public transport interventions.
- 3.3.35 The TAG unit outlining the Stage 1 appraisal process advocated the use of the EAST as a decision support tool. EAST provides a framework for summarising corridors that are consistent with the "Transport Business Case Five Model". This model requires assessment against: Strategic Case, Economic Case, Management Case, Financial Case and Commercial Case.
- 3.3.36 The results of the assessment against EAST, which contributes to the EAST+ methodology, are summarised in Table 3-5 below.

Table 3-5: Results of assessment against EAST cases

EAST Case	Corridor A	Corridor B	Corridor C	Corridor D	Corridor E
Strategic Case	2	2	4	2	2
Economic Case	2	2	4	2	2
Managerial Case	2	2	4	2	2
Financial Case	1	1	4	3	3
Commercial Case	1	1	4	3	3
Overall EAST Assessment	1	1	4	2	2

Source: National Highways (2019)

- 3.3.37 Corridor C scored the highest due to being the most direct corridor resulting in a higher overall score in terms of its strategic, economic, management, financial and commercial case compared to Corridors A, B, D and E.
- 3.3.38 The EAST methodology was supplemented and expanded to include additional environmental aspects and application of a scoring system that would allow differentiation between corridor options. To avoid

⁵ Department for Transport (2011) Early Assessment Sifting Tool (EAST) Guidance document [online] available at: [Early Assessment and Sifting Tool \(EAST\) Guidance.pdf \(publishing.service.gov.uk\)](#) (last accessed December 2023).

“double-counting”, the environment assessment is not duplicated within the EAST assessment but was cross-referenced and presented separately. Therefore, EAST+ was adopted which gave weight to environmental impact and policy compliance comparative to other topics considered.

- 3.3.39 The DfT EAST+ applied a 5-point scale on carbon emissions, economic growth, wellbeing, local environment and socio-distributional impacts to appraise the Scheme. By doing so, the tool formed an early view of how options performed and compared. In particular, the local environment was assessed by considering air quality, noise, natural environment, heritage and landscape, streetscape and urban environment.
- 3.3.40 The results of the assessment against the EAST+ environmental criteria (having regard to EAST and NSPNN) are summarised in Table 3-6 below.

Table 3-6: Results of assessment against the EAST+ environmental criteria (having regard to EAST and 2015 NPSNN)

Environmental Criteria	Corridor A	Corridor B	Corridor C	Corridor D	Corridor E
Historic Environment	1	2	2	1	1
Biodiversity	2	2	2	2	2
Air Quality	3	3	3	3	3
Noise	2	2	2	2	2
Landscape and Visual	1	2	2	1	3
Water	1	3	2	1	3
Geology, Soils and Materials	2	2	2	2	2
People and Communities	1	1	2	1	1
Climate	1	1	2	1	1
Climate Adaptation	1	1	2	1	2
Overall Environmental Assessment	1	2	2	1	2

Source: National Highways (2019)

- 3.3.41 Corridor C, which uses the existing A46 corridor, was the best performing corridor in terms of user benefits, providing the greatest

reductions in journey times, delays and incidents, and improvement in reliability. The user benefits were lower for Corridors A, B, D and E due to these corridors being longer. With a longer corridor there were less journey time savings and the lower level of diversion from the existing A46 corridor (as this would remain in place) would mean it was unlikely to resolve the capacity issues on the A46 at Cattle Market, Friendly Farmer, Brownhills or Winthorpe Roundabouts, reducing the benefits for other users.

- 3.3.42 Furthermore, Corridor C performed better in environmental terms in achieving potential improvements in terms of carbon, noise and the local water environment. Corridor C was preferential in comparison with Corridors A and D, and slightly more preferential than Corridors B and E resulting in a moderate risk of potential negative impacts on key environmental constraints, including sensitive, high-value heritage, water, landscape and visual and noise receptors. However, improvement on performance during Options Identification was further required, ensuring mitigation of potential impacts, including adequate provision for floodplain compensation.
- 3.3.43 The environmental assessment concluded that all corridors scored equally on biodiversity, air quality, noise, geology, soils and materials. However, Corridor D scored the best on landscape and visual effects, Corridor D and B performed best on flood risk criteria, while Corridor C scored the best on historic environment, people and communities, and climate. Corridor C performed the best overall from an environmental perspective. Following the assessment undertaken for this sifting, it was concluded from an environmental perspective that Corridor C should be taken forward for further consideration, and that no other corridors should be considered further.

Conclusion - Corridor Identification and Sifting (Design Fix A)

- 3.3.44 An overall summary of the assessment for each corridor option against the three criteria by a five-point scale is presented in Table 3-7 below.

Table 3-7: Overall Corridor assessment summary

Assessment Method	Corridor A	Corridor B	Corridor C	Corridor D	Corridor E
CSR	1	2	3	1	1
NPSNN	1	2	2	1	2
EAST	1	1	4	2	2

Source: National Highways (2019)

- 3.3.45 To summarise, Corridor C was the best scoring with the application of the Scheme objectives, 2015 NPSNN and EAST assessment methodology. It was recommended that Corridors A, B, D and E

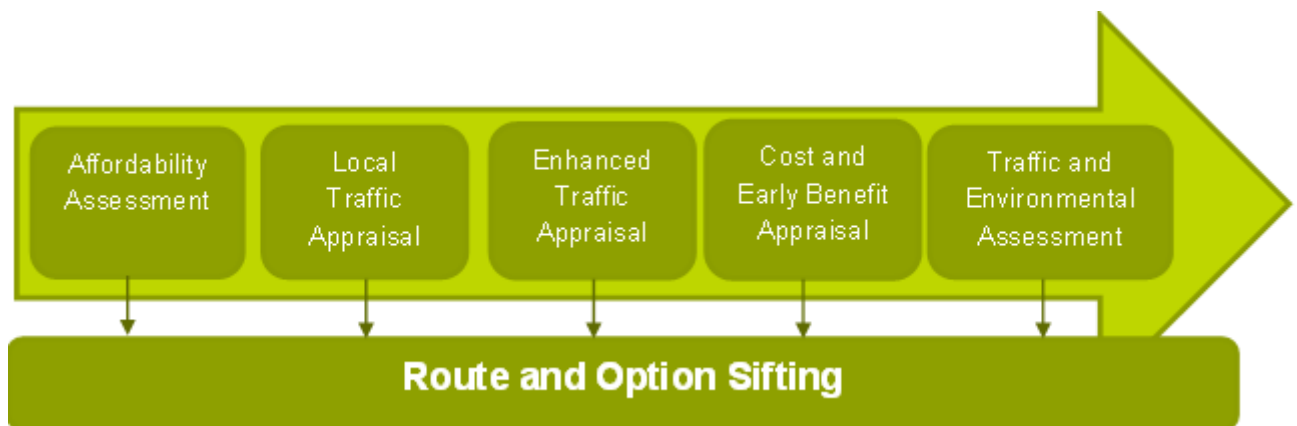
would not be considered further. This is because A and D scored poorly against the Scheme objectives for environment and EAST+ appraisal outcomes. Corridors B and E were eliminated because of their non-compliance with environmental policy. Further details are contained within the Options Summary Report⁶.

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

Option Identification – Route and Options Sifting stage

- 3.3.47 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.
- 3.3.48 The steps within the Route and Option Sifting process are shown in Figure 3.3, which consists of an Affordability Assessment, Local Traffic Appraisal, Enhanced Traffic Appraisal, Cost and Early Benefit Appraisal and Traffic and Environmental Assessment.

Figure 3.3: Option Sifting Process



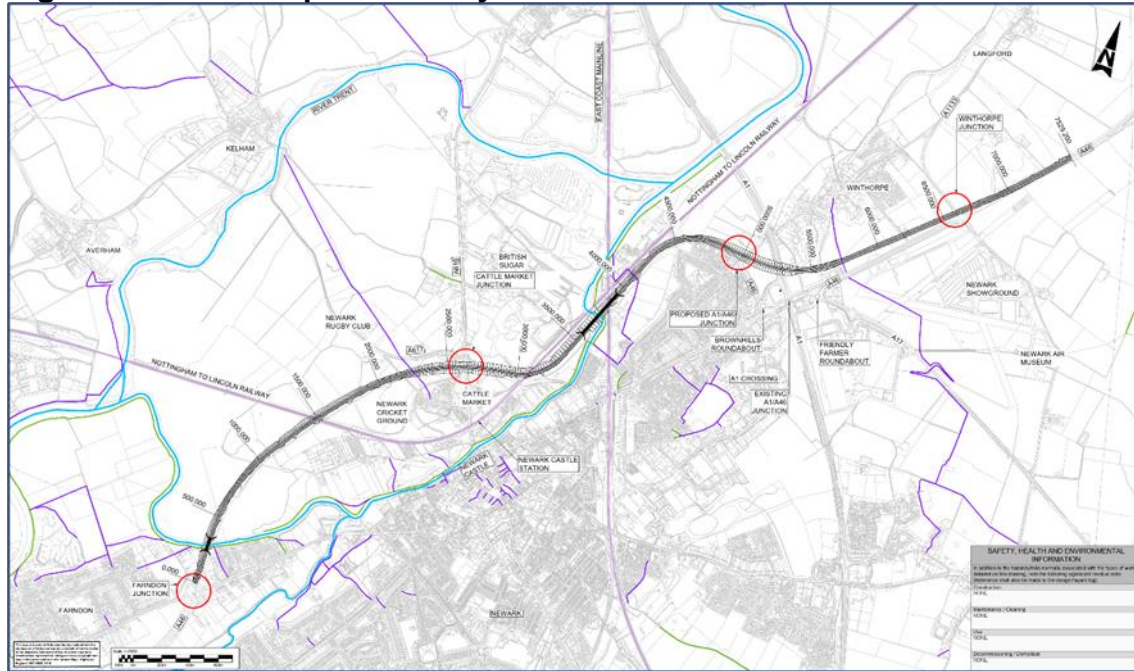
Source: National Highways (2019)

- 3.3.49 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-joined the A46 to the north of Winthorpe.
- 3.3.50 The routes differed in layout along the bypassing section:
- Route Option 1 (the Southern route): bypassed south of Winthorpe. There were two variations:

⁶ National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](#) (last accessed December 2023).

- 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 northbound carriageway and south of Winthorpe, before rejoining the existing A46 approximately 700 metres north of the existing Winthorpe Roundabout (see Figure 3.4 below).

Figure 3.4: Route Option 1A Layout Plan

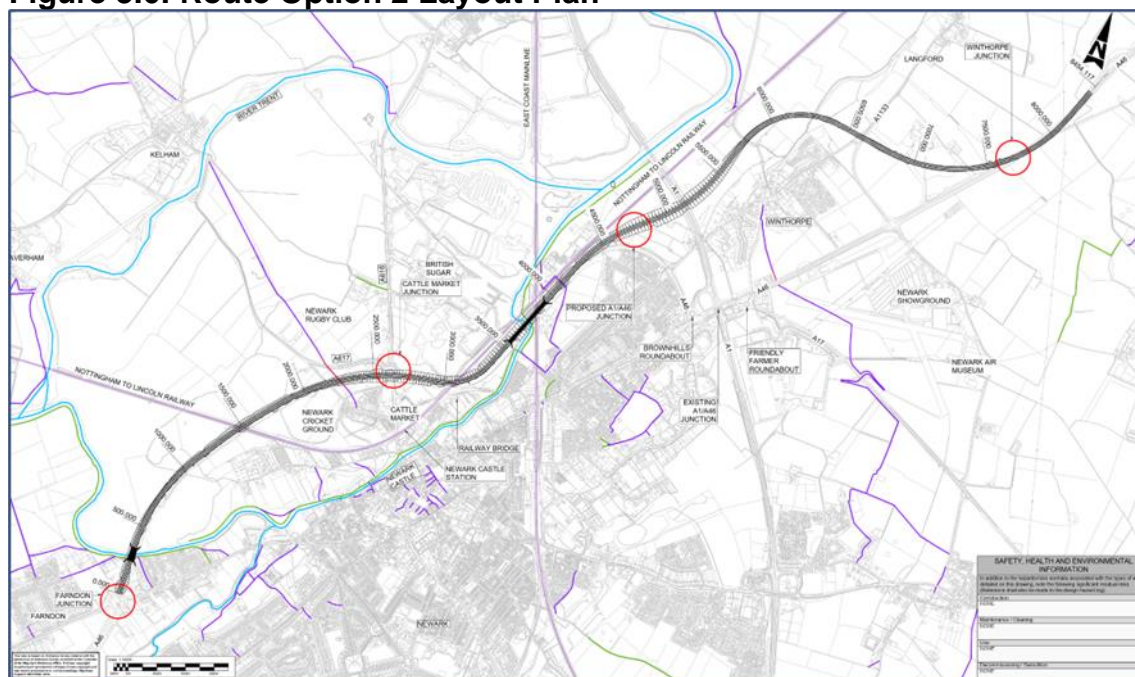


Source: National Highways (2021)

- 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 3.5 below). Route Option 1B was approximately 1 kilometre shorter in construction length than Route Option 1A.

- 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 3.6 below). Route Option 2 was approximately 1 kilometre longer in construction length than Route Option 1A.

Figure 3.6: Route Option 2 Layout Plan



Source: National Highways (2021)

- 3.3.51 The route options underwent a sifting process (as outlined in Figure 3.4 above) which concluded that Route Option 2 would incur a substantially 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.
- 3.3.52 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 had a lesser adverse economic impact on businesses and development.
- 3.3.53 To conclude, it was recommended that Route Options 1A and 1B were taken forward for further assessment.

Option Identification – Junction Sifting

- 3.3.54 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 included each of the four junctions which were sifted: Farndon Junction, Cattle Market Junction, A1/A46 Junction and Winthorpe Junction.
- 3.3.55 The improvements to the junctions sought 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.

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

Option Identification – Scheme Option Appraisal

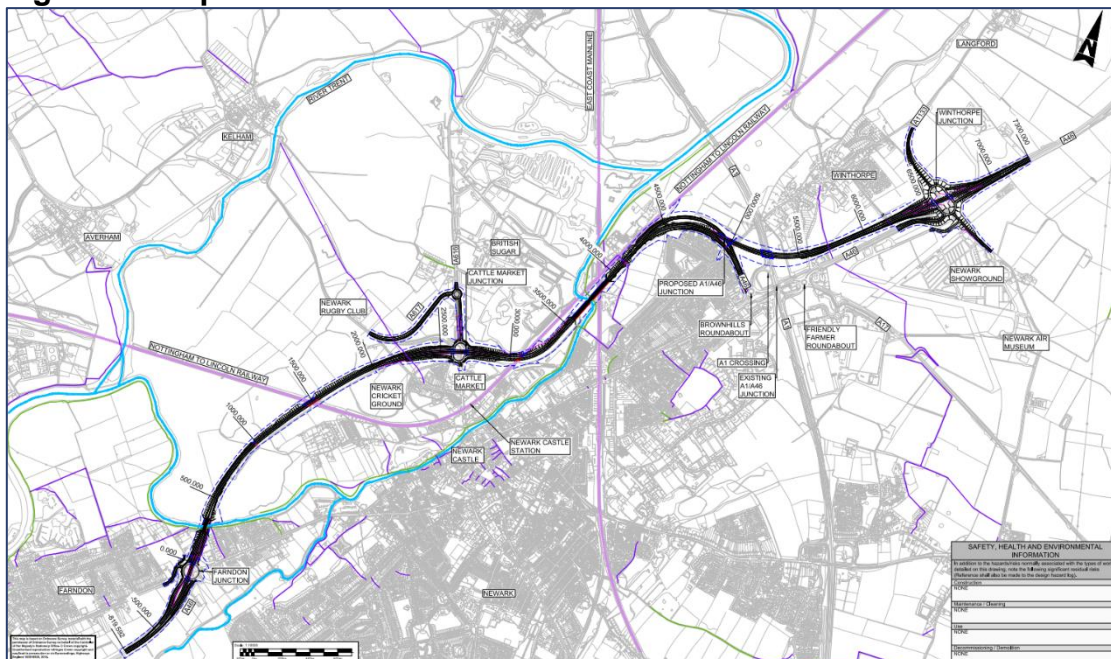
Introduction

- 3.3.57 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.

Scheme Options

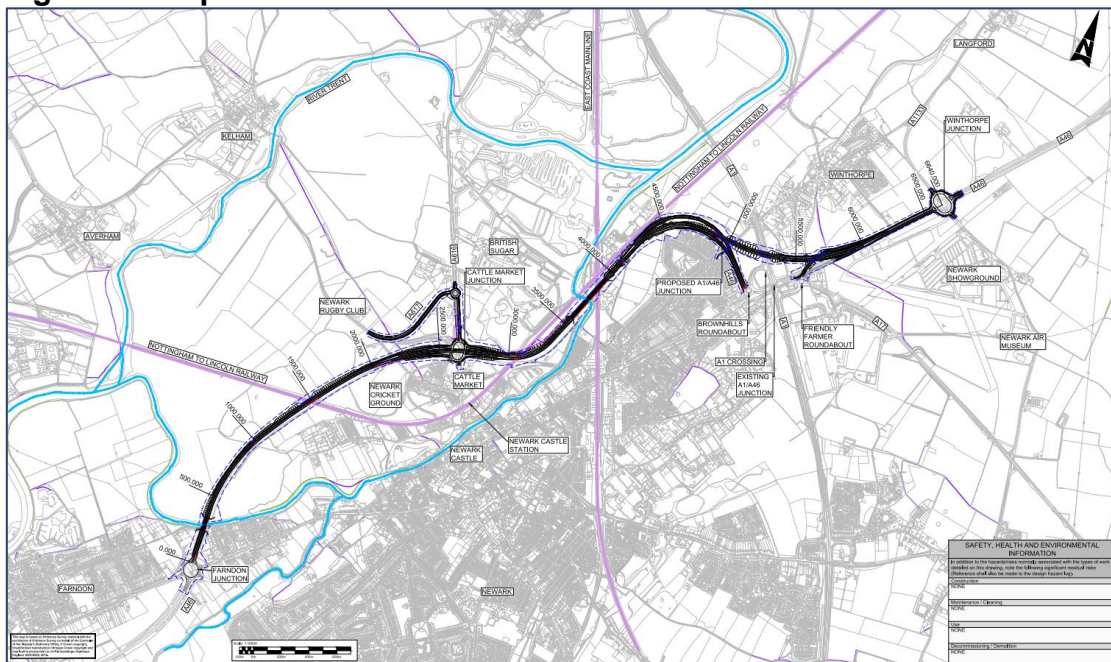
- 3.3.58 Following previous assessment, three Scheme options were identified in September 2020 for further assessment:
- Option A – The A46 would follow the existing A46 mainline from Farndon Roundabout to the north of the existing Trent River Viaduct. From here, the route diverged away from the existing mainline, bypassing the existing A1/A46 Junction, and crossed over the A1 via a new structure. It then ran 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 3.7 below).

Figure 3.7: Option A



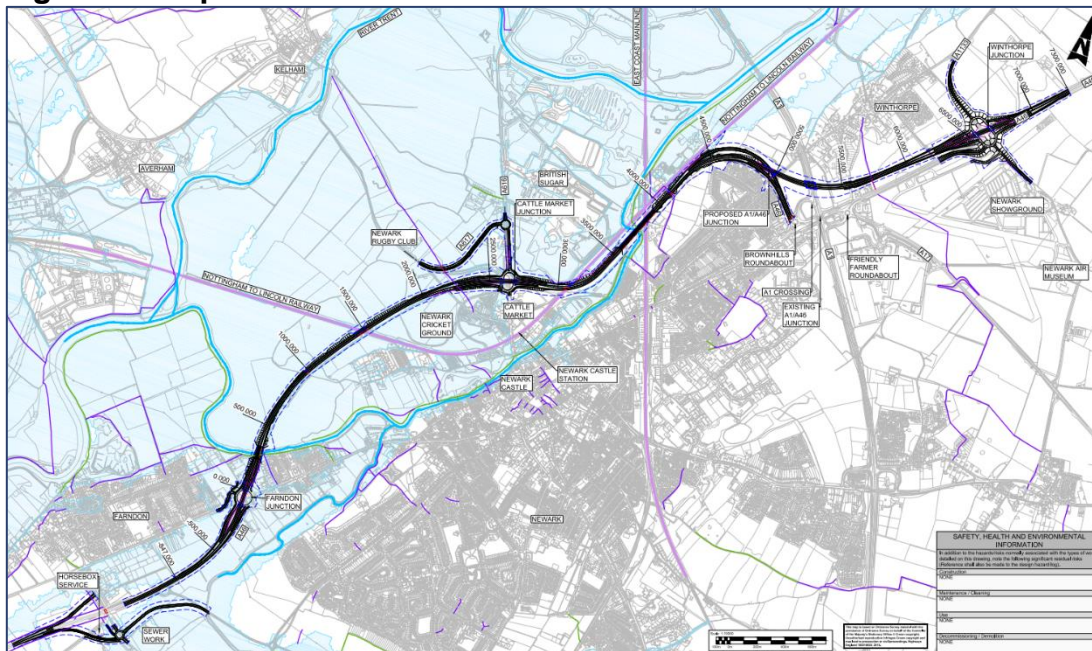
Source: National Highways (2021)

- ### Figure 3.8: Option B



- 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 Newark Southern Link Road (SLR) junction on the Scheme. The SLR is being delivered by Urban and Civic and Newark & Sherwood District Council. The SLR will 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 SLR roundabout, tying the A46 Scheme in with the SLR, and provide grade separated links (see Figure 3.9 below).

Figure 3.9: Option C



Source: National Highways (2019)

- 3.3.59 Consideration was given to removing the new roundabout and instead realigning the SLR to tie into the improved Farndon Junction, therefore 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.
- 3.3.60 An alternative layout was developed to remove the at-grade roundabout, diverting the SLR south to a new half junction at Hawton Lane with south-west-facing slips. The Scheme was paused ahead of the Option Identification – Scheme Option Appraisal stage by the Applicant due to the Scheme not yet being announced as part of the RIS2.
- 3.3.61 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.
- 3.3.62 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 in to 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.

- 3.3.63 All four options were evaluated against the engineering, traffic and economic, environmental, social and safety, operation, technology and maintenance assessments. The key findings from the environmental assessment and TAG appraisal are described in the following paragraphs.
- 3.3.64 In terms of engineering assessment Option B and Option D were comparable and required the least number of structures and volumes of earthworks, hence they had the lowest Scheme costs. Options A and C required the greatest number of structures and volumes of earthworks, therefore, incurred the highest Scheme costs. Although Option B had a lower Scheme cost, the grade separated junctions in Options A and C would have allowed the free flow of traffic along the A46 mainline.
- 3.3.65 The land take, including agricultural and Best and Most Versatile (BMV) land, for Option A and Option C would have been greater than for Option B and Option D. Given that much of the area is designated as 'at flood risk', there would have been a requirement for all options to provide a significant volume of additional flood compensation storage outside the flood risk areas (Flood Zones 2 and 3).
- 3.3.66 All options 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 adjusted Benefit Cost Ratio.
- 3.3.67 Overall, Option B and Option D would have resulted in fewer less 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 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.
- 3.3.68 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 security⁷ and personal affordability⁸.

- 3.3.69 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.
- 3.3.70 Grade separated Options A and C would have generally resulted in lower overall risks during the operation phase of the Scheme, whilst the more at grade layouts in Option B and Option D would have been expected to result in lower overall risks during the construction, maintenance and demolition phases.
- 3.3.71 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.
- 3.3.72 Option A and Option C would also have greater environmental impacts due to:
- Increased construction within the floodplain which would require compensating.
 - Significant impacts within an area of known archaeology of international significance at Farndon.
 - Increased visual impacts associated with the additional grade separated junctions.
 - Greater number of properties would experience increases in noise.
- 3.3.73 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 significantly more expensive than Options B and D due to the additional construction but did not provide enough additional benefits to justify the increased cost (Table 3-8). This resulted in Options B and D scoring higher adjusted Benefit Cost Ratio (BCR) compared to Options A and C (Table 3-8).

⁷ “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 Nov 2022 Accessible v1.0 \(publishing.service.gov.uk\)](#) (last accessed December 2023).

⁸ “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 Nov 2022 Accessible v1.0 \(publishing.service.gov.uk\)](#) (last accessed December 2023).

Table 3-8: Most likely forecast outturn and adjusted BCR for Scheme options A, B, C and D as outlined in the Stage 1 Options Identification Stage

Scheme Option	Forecast Outturn	Adjusted BCR
A	£649,500,869	0.92
B	£462,322,327	0.93
C	£661,918,439	0.87
D	£479,887,544	1.23

Source: National Highways (2019)

3.3.74 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 public consultation – Option 1 was previously referred to as Option B, and Option 2 was previously referred to as Option D.

Alternative Modes Assessment

3.3.75 An Alternative Modes Assessment was carried out by the Applicant in 2021 which suggested that the existing public transport network does not generally offer comparable alternatives to car for most movements. Small traffic flows were distributed over a large area and therefore are not suited to be catered for by public transport. Local demand in aggregate accounts for a sizeable proportion of traffic using the A46 at Newark. Therefore, a review of the largest public transport flows (represented by local bus services) suggested that there was no obvious non-highways intervention that could cater to any substantial proportion of these flows.

Option Selection – options public consultation

3.3.76 Two options were taken forwards into the Options Selection stage (Figure 3.10). 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 3.10: Option 1 (left) Option 2 (right)



3.3.77 A total of 852 respondents, out of 1,584 responses, gave feedback on concerns about issues in relation to the Scheme during the options consultation; further details are contained within the Report on Public Consultation appended to the Consultation Report [APP-028]. The most cited concerns across both options included amendments and improvements to both the options covering such comments as:

- 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.

3.3.78 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. Section 4.7 of the Options Summary Report⁹ summarises the assessment of the Scheme options and scope for mitigation.

3.3.79 The 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 monitoring¹⁰ and DMRB LA 103 Scoping projects for environmental assessment¹¹.

⁹ National Highways (2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](#) (last accessed December 2023).

¹⁰ Design Manual for Roads and Bridges (2020) LA 104 – Environmental assessment and monitoring [online] available at: [LA 104 - Environmental assessment and monitoring \(standardsforhighways.co.uk\)](#) (last accessed December 2023).

¹¹ Design Manual for Roads and Bridges (2020) LA 103 – Scoping projects for environmental assessment [online] available: [LA 103 - Scoping projects for environmental assessment \(standardsforhighways.co.uk\)](#) (last accessed December 2023).

- 3.3.80 An environmental assessment was carried out to inform the comparison of environmental effects for Options 1 and 2 and to support the selection of the preferred option. A summary of the outcomes of the environmental assessment conclusions for both options is contained within Section 4.7 Environmental Assessment contained within the Options Summary Report¹². Selection of Option 2 was informed by the conclusion of the assessment and feedback received from the Options consultation.
- 3.3.81 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 potential significant effects, especially around Winthorpe and Cattle Market Junction.
- 3.3.82 From an environmental perspective, a summary of the likely residual significant effects are in Table 3-9 below.

¹² National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](#) (last accessed December 2023).

Table 3-9: Summary of likely residual significant effects for Option 1 and Option 2 during construction and operation

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
Air Quality	No significant effects			
Cultural Heritage	<p>Large adverse (significant) effect on one scheduled monument.</p> <p>Moderate to large (significant) adverse effect on one scheduled monument.</p> <p>Moderate adverse (significant) effect on one scheduled monument.</p> <p>Potential significant effects on 10 high value designated assets that may detract from the extent to which their settings contribute to their significance.</p> <p>Moderate adverse (significant) effect on the Winthorpe Conservation Area.</p> <p>Potential to permanently remove parts of 10 non-designated heritage assets.</p>	<p>Moderate to large (significant) adverse effect on one scheduled monument.</p> <p>Potential significant effects on 10 high value designated assets.</p>	<p>Large adverse (significant) effect on one scheduled monument.</p> <p>Moderate adverse (significant) effect on one scheduled monument.</p> <p>Potential significant effects on 10 high value designated assets that may detract from the extent to which their settings contribute to their significance.</p> <p>Moderate adverse (significant) effect on the Winthorpe Conservation Area.</p> <p>Potential to permanently remove parts of 10 non-designated heritage assets.</p>	<p>Potential significant effects on 10 high value designated assets.</p>
Landscape and Visual	<p>Large adverse (significant) effect on local landscape qualities, for example areas</p>	<p>Moderate adverse (significant) effects on 4 viewpoints.</p>	<p>Large adverse (significant) effect on local landscape qualities, for example areas</p>	<p>Moderate adverse (significant) effects on 3 viewpoints.</p>

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
	<p>close to Winthorpe and Farndon, reducing upon completion and over the longer-term.</p> <p>Moderate adverse (significant) effect on landscape features within 150m of route option boundary and regional LCAs, reducing upon completion and over the longer term.</p> <p>Large adverse (significant) effects on 7 viewpoints.</p> <p>Moderate adverse (significant) effects on 5 viewpoints.</p> <p>Likely significant effects on other residential and business receptors within 250m.</p>	<p>Likely significant effects on other residential and business receptors within 250m.</p>	<p>close to Winthorpe and Farndon, reducing upon completion and over the longer term.</p> <p>Moderate adverse (significant) effect on landscape features within 150m of route option boundary and regional LCAs, reducing upon completion and over the longer term.</p> <p>Large adverse (significant) effects on 6 viewpoints.</p> <p>Moderate adverse (significant) effects on 5 viewpoints.</p> <p>Likely significant effects on other residential and business receptors within 250m.</p>	<p>Likely significant effects on other residential and business receptors within 250m.</p>
Biodiversity	<p>Moderate adverse (significant) effect on eight local wildlife sites.</p> <p>Moderate adverse (significant) effect on four habitat types.</p>	No significant effects	<p>Moderate adverse (significant) effect on four local wildlife sites.</p> <p>Moderate adverse (significant) effect on two habitat types.</p>	No significant effects

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
	<p>Moderate adverse (significant) effect on River Trent (Newark Branch).</p> <p>Moderate adverse (significant) effect on Old Trent Dyke.</p> <p>Moderate adverse (significant) effect on four standing waterbodies.</p> <p>Moderate adverse (significant) effect on reptiles and birds.</p>		<p>Moderate adverse (significant) effect on River Trent (Newark Branch).</p> <p>Moderate adverse (significant) effect on Old Trent Dyke.</p> <p>Moderate adverse (significant) effect on three standing waterbodies.</p> <p>Moderate adverse (significant) effect on reptiles and birds.</p>	
Geology and Soils	Large adverse (significant) effects on BMV land (Grade 2) and soils due to permanent loss of agricultural land.	No significant effects	Large adverse (significant) effects on BMV land (Grade 2) and soils due to permanent loss of agricultural land.	No significant effects
Materials and Waste	No significant effects			
Noise and Vibration	Without temporary noise mitigation, potential significant adverse effects are likely at properties that are 50m from the works during the day, 100m from the works during the evening	<p>Significant adverse noise increase at Cattle Market junction.</p> <p>Significant adverse noise increase at Midland Terrace/Mather Road.</p>	Without temporary noise mitigation, potential significant adverse effects are likely at properties that are 50m from the works during the day, 100m from the works during the evening	<p>Significant adverse noise increase at Winthorpe Fosse Road.</p> <p>Significant adverse noise increase at Midland Terrace/Mather Road.</p>

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
	or weekend and 300m from the works at night.		or weekend and 300m from the works at night.	<p>Significant adverse noise increase at Great North Road.</p> <p>Significant adverse noise increase at Farndon roundabout.</p> <p>Significant adverse noise increase at Newark Road.</p>
Population and Human Health	<p>Large or very large (significant) adverse effect due to permanent land take and demolition of a petrol filling station and a restaurant.</p> <p>Large adverse (significant) effects BMV land (Grade 2) and soils due to permanent loss of agricultural land.</p> <p>Moderate or large adverse (significant) effect on users of PRoW of high or very high sensitivity.</p> <p>Slight or moderate adverse (significant) effect on users of the Trent Valley Way long distance path and the National Cycle Network Route Number 64.</p>	<p>Moderate beneficial (significant) effect due to the signalised junctions proposed at Farndon and Winthorpe roundabouts that will improve crossing provision for WCH at these junctions.</p> <p>Moderate beneficial (significant) effect of the pedestrian crossings which would form part of the hamburger roundabout at Cattle Market that will be a benefit to WCH.</p> <p>A negative health outcome has been identified for residents to the south of Winthorpe, at the Spinney, due to the proximity of the revised alignment of the A46 to the residential properties located there. A negative</p>	<p>Permanent loss of grounds at the property at Brae Barn, Hargon Lane. The resultant effect is moderate adverse (significant).</p> <p>Large adverse (significant) effects BMV land (Grade 2) and soils due to permanent loss of agricultural land.</p> <p>Moderate or large adverse (significant) effect on PRoW of high or very high sensitivity.</p> <p>Slight or moderate adverse (significant) effect on users of the Trent Valley Way long distance path and the National Cycle Network Route Number 64.</p> <p>Slight or moderate adverse (significant) effect on users of</p>	<p>Moderate beneficial (significant) effect due to the signalised junctions proposed at Farndon and Winthorpe roundabouts that will improve crossing provision for WCH at these junctions.</p> <p>Moderate or large beneficial (significant) effect of the grade separated junction at Cattle Market junction that would enhance conditions for pedestrians through removal of A46 through-traffic.</p> <p>A negative health outcome has been identified for residents of the property on Hargon Lane (Brae Barn) due to a combination of noise, visual and air quality effects. A negative health outcome is predicted to endure, even</p>

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
	Slight or moderate adverse (significant) effect on users of a footpath through gaps in the crash barrier within the central reserve of the A46 to the east of the Friendly Farmer Roundabout.	health outcome is predicted to endure, even with mitigation measures implemented during operation of the scheme.	a footpath through gaps in the crash barrier within the central reserve of the A46 to the east of the Friendly Farmer Roundabout.	with mitigation measures implemented during operation of the Scheme.
Road Drainage and the Water Environment	<p>Large adverse (significant) effect on one watercourse.</p> <p>Moderate adverse (significant) effect on five watercourses.</p> <p>Moderate adverse (significant) effect on non-WFD surface water drainage ditches.</p> <p>Very large adverse (significant) effect on five floodplains (Flood Zones 2 and 3).</p>	<p>Moderate adverse (significant) effect on Secondary B Bedrock Aquifer.</p> <p>Moderate adverse (significant) effect on Secondary A Superficial Aquifer.</p> <p>Very large adverse (significant) effect on four floodplains (Flood Zones 2 and 3).</p>	<p>Large adverse (significant) effect on one watercourse.</p> <p>Moderate adverse (significant) effect on five watercourses.</p> <p>Moderate adverse (significant) effect on non-WFD surface water drainage ditches.</p> <p>Very large adverse (significant) effect on five floodplains (Flood Zones 2 and 3).</p>	<p>Moderate adverse (significant) effect on Secondary B Bedrock Aquifer.</p> <p>Moderate adverse (significant) effect on Secondary A Superficial Aquifer.</p> <p>Very large adverse (significant) effect on four floodplains (Flood Zones 2 and 3).</p>
Climate Effects	No significant effects			
Vulnerability to Climate Change	No significant effects			
Cumulative Effects	Moderate adverse (significant) effect on cumulative landscape character and visual amenity effects of route option in		Moderate adverse (significant) effect on cumulative landscape character and visual amenity effects of route option in	

Topic	Option 1		Option 2	
	Construction	Operation	Construction	Operation
	conjunction with the SUE south of Newark-on-Trent in terms of the loss of BMV Agricultural Land.		conjunction with the SUE south of Newark-on-Trent in terms of the loss of BMV Agricultural Land.	

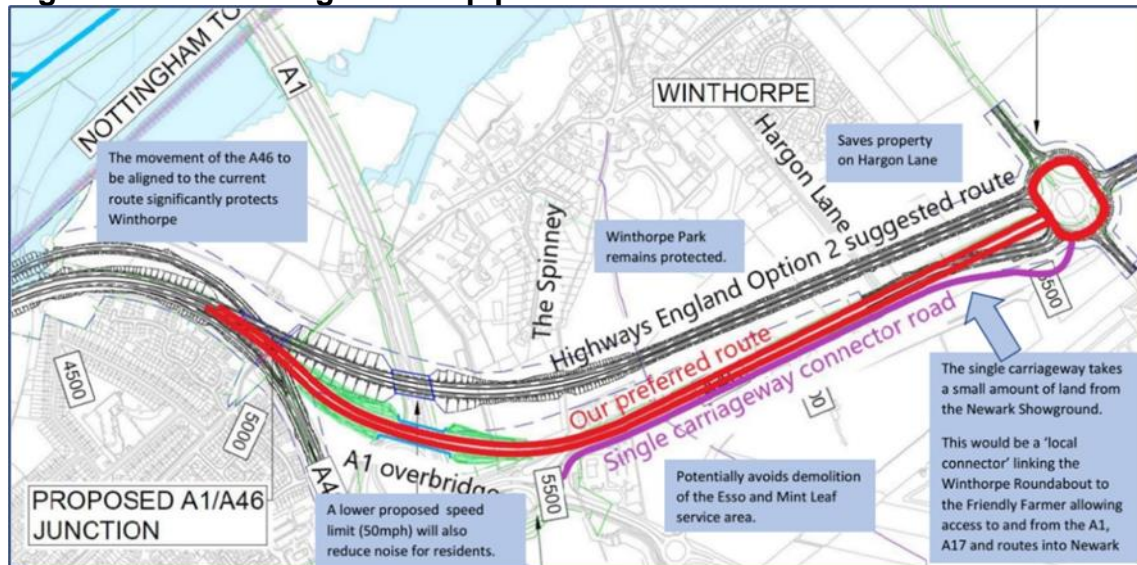
3.3.83 Following the Options Consultation, the 'Think Again' Action Group proposed an alternative solution (named Option 3) for the section of the A46 between the A1 and Winthorpe Junction (Figure 3.11 below). Drawings produced by the Think Again Action Group were submitted to the Applicant in April 2021. In response to this, a technical note was produced by the Applicant in June 2021 as a review of the proposal with a follow-up, 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.

3.3.84 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. Therefore, this suggestion was not considered in the design going forward in Stage 2. However, 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.
- The demolition of the Mint Leaf restaurant and service station.

Figure 3.11: Think Again Group preferred route



Source: Think Again Group (2021)

- 3.3.85 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.

Preliminary design – preferred option

- 3.3.86 The Applicant announced the preferred route (Option 2 Modified) in February 2022 (Figure 3.12 below). It is this route which forms the basis for the Scheme assessed within this Environmental Statement. Since that time the development of the Scheme design has been undertaken in accordance with the criteria for ‘good design’, outlined in the 2015 NPSNN. Further details can be found in the Scheme Design Report [APP-194].
- 3.3.87 An Environmental Scoping Report¹³ was prepared and submitted to the Planning Inspectorate in September 2022. A Preliminary Environmental Information Report¹⁴ was then prepared which supported the statutory consultation that took place between October and December 2022.
- 3.3.88 Amendments to the design, reflective of the design evolution in response to consultation, engagement and outcomes of the environmental impact assessment, are reported in Table 3-11 and

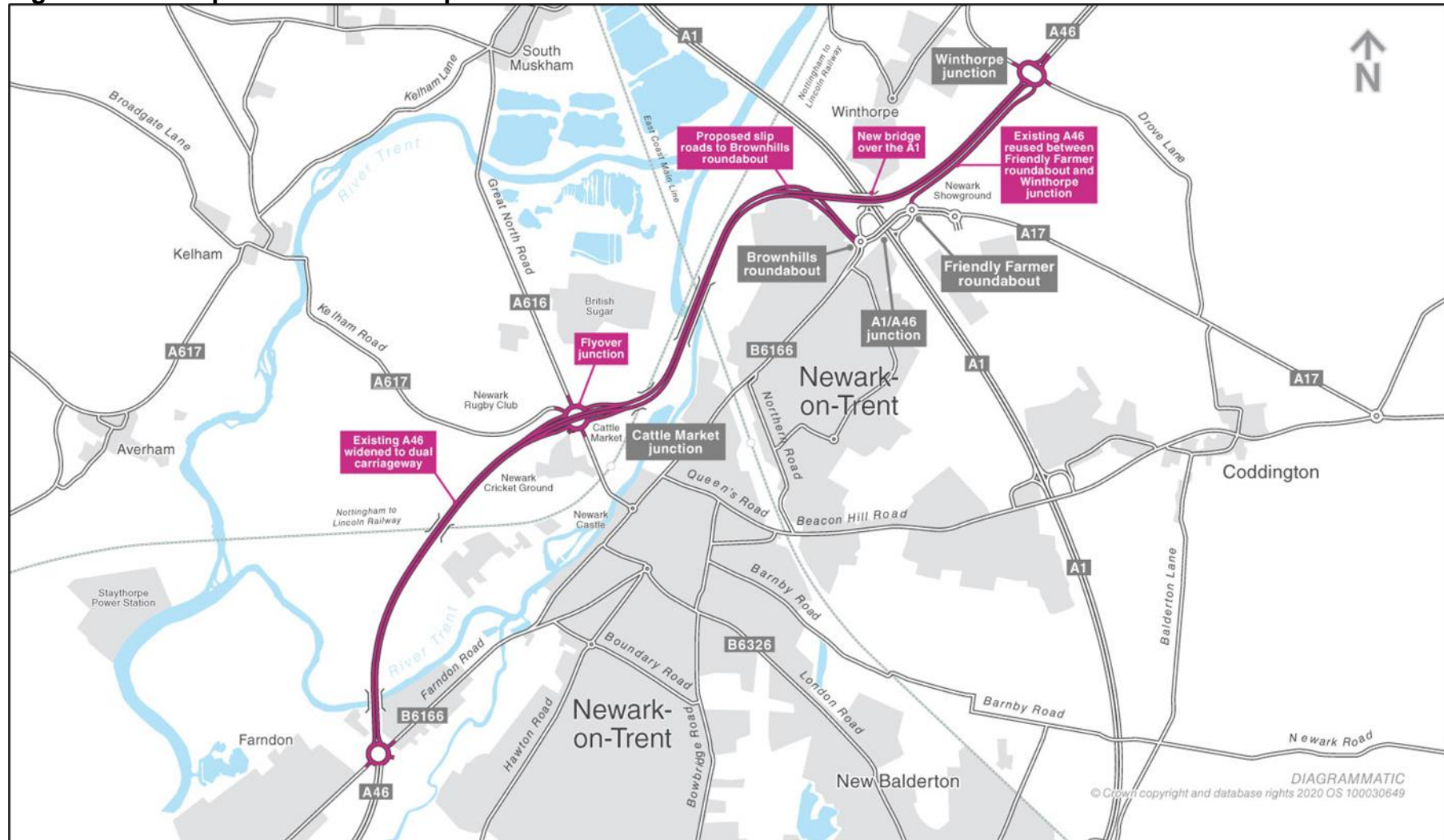
¹³ National Highways (2022) A46 Newark Bypass Environmental Scoping Report [online] available at: [TR010065-000002-A46N - Scoping Report.pdf \(planninginspectorate.gov.uk\)](https://www.planninginspectorate.gov.uk/tr010065-000002-A46N-Scoping-Report.pdf) (last accessed December 2023).

¹⁴ National Highways (2022) A46 Newark Bypass Preliminary Environmental Information Report – Volume 1 Main Report [online] available at: [Preliminary Environmental Information Volume 1 Main Report.pdf \(citizenspace.com\)](https://www.citizenspace.com/preliminary-environmental-information-volume-1-main-report.pdf) (last accessed December 2023).

Table 3-12 below. Further details are also available in the Consultation Report [APP-028].

- 3.3.89 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 this ES, as well as consultation with environmental bodies to further inform the assessments. Full details of these assessments are present within Chapters 5 to 15 of this ES.

Figure 3.12: The preferred route – Option 2 Modified



Floodplain compensation areas

- 3.3.90 In addition to alternatives associated with the main Scheme alignment, several alternatives have been considered during the development of the floodplain compensation areas (FCAs) which are required as part of the Scheme. This is because of the number of different sites considered and screened depending on their suitability.
- 3.3.91 Following the announcement of the preferred route, Appendix 13.2 (Flood Risk Assessment) of the ES Appendices [REP6-010] has been prepared to support the development consent application for the Scheme. The aim of the FRA is to assess the flood risk impact of the operational and construction stages of the Scheme. The process consisted of a site screening stage and a final selected sites stage, which is summarised below and detailed further in Appendix 13.2 (Flood Risk Assessment) of the ES Appendices [REP6-010].

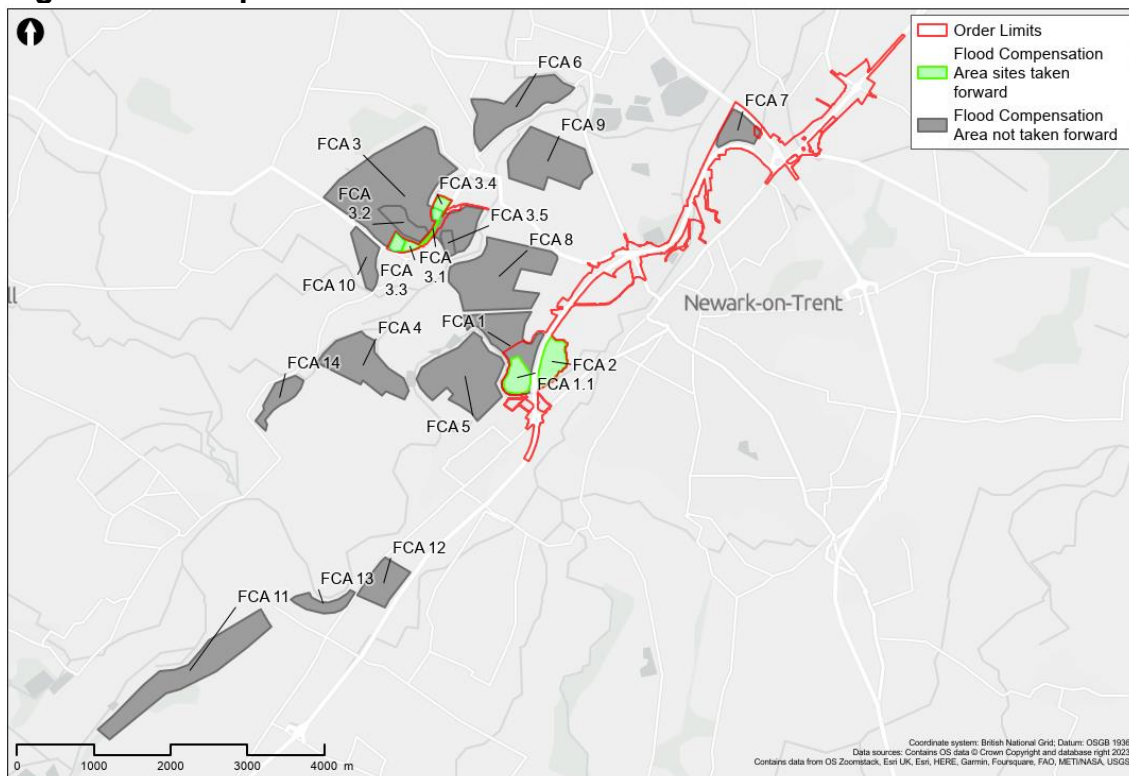
Overview

- 3.3.92 As the Scheme is located within a floodplain, floodplain compensation is required to provide level for level, volume for volume compensation for the displacement of floodplain storage. The FCAs will be built in advance of the Scheme features for which they are required.

Site screening

- 3.3.93 At an early stage of the Scheme development, an FCA was identified (the Kelham and Averham site). During the following outline design stage, the Kelham and Averham site as a 'single site' solution was considered unlikely to be viable due to several risk factors as summarised below:
- The site is downstream of most of the high-elevation flood-plain encroachment and is therefore partially indirect floodplain compensation.
 - Using the site as a single site solution requires a large land-take, reducing the economic viability of the Scheme.
 - The land-take required for a single site solution would have conflicted significantly with other development proposals for the land. Enabling hydraulic connectivity for a single-site solution would have required a significant modification to an existing watercourse near the site.
 - The site would be flooded (on at least a yearly basis) which would change its existing usage.
- 3.3.94 Due to the above risk factors, further compensation sites were reviewed to find a 'multi-site' solution. Figure 3.13 shows the locations of all 29 sites considered (note that some sites are sub-sections of the sites shown). All sites considered needed to be within close hydraulic proximity to the Scheme, ruling out sites both upstream of Hazelford weir and downstream of the portion of the Scheme that passes through the floodplain.

Figure 3.13: Map of screened FCA sites



Source: Mott MacDonald Ltd/Skanska. Contains data from OS Zoomstack, Contains OS data © Crown Copyright and database right 2019

3.3.95 The 29 considered sites shown in Figure 3.14 were selected on the following basis:

- Correct topographic elevations for the required level for level, volume for volume floodplain compensation
- Existing land use
- Proximity to the Scheme and the River Trent to ensure a degree of hydraulic connectivity

3.3.96 All 29 possible FCA sites then went through a site screening process at an early stage of the design process, using information available at that time. This screening process is further detailed within Appendix G of Appendix 13.2 (Flood Risk Assessment) of the ES Appendices [REP6-010]. This included a RAG (Red, Amber, Green) rating of each site based on an extensive list of criteria including the following key considerations:

- Hydraulic connectivity and associated impact on flood risk
- Existing land usage, land availability (including future planning applications) and public rights of way
- Ecology
- Archaeology and heritage
- Utilities
- Land contamination
- Groundwater
- Geotechnical

Final selected sites

- 3.3.97 The outcome of the screening process selected two broad areas:
- Kelham and Averham area – based primarily on correct topographic elevations, reasonable proximity to the Scheme, existing and future land use, and located adjacent to the central floodplain impacted by the Scheme.
 - Farndon area – based on a combination of reasons including immediate proximity to the Scheme, existing and future land use, correct topographic elevations and existing land use.
- 3.3.98 Using these broad areas, land parcels were then discussed with key stakeholders, including the landowners, to identify the most suitable sites. The Kelham and Averham FCA utilises some land that has separate proposals for use as a solar farm. The Environment Agency has provided agreement in principle to the dual use of this land for both schemes.

Design development following the preferred route announcement

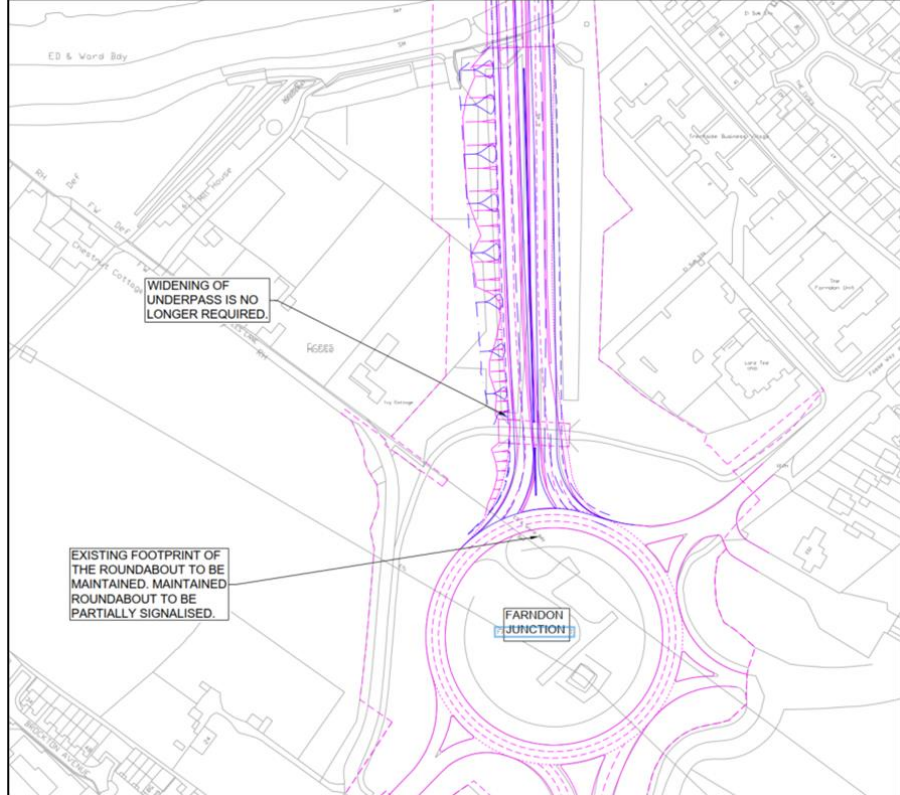
- 3.3.99 This section summarises the design developments that have taken place since the preferred route announcement and up to the time of statutory consultation.
- 3.3.100 These design developments were assessed against compliance with design standards, including National Highways' 10 principles of good design¹⁵ and further consultation with key stakeholders including the Think Again Group at Winthorpe, and 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.
- 3.3.101 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
- 3.3.102 Further details are provided in Table 3-10 below.
- 3.3.103 The design developments that have taken place between the preferred route announcement and statutory consultation, for each

¹⁵ National Highways (2022) People Places and Processes: A guide to good design at National Highways [online] available at: [People, places and processes \(nationalhighways.co.uk\)](https://www.nationalhighways.co.uk/people-places-and-processes) (last accessed December 2023).

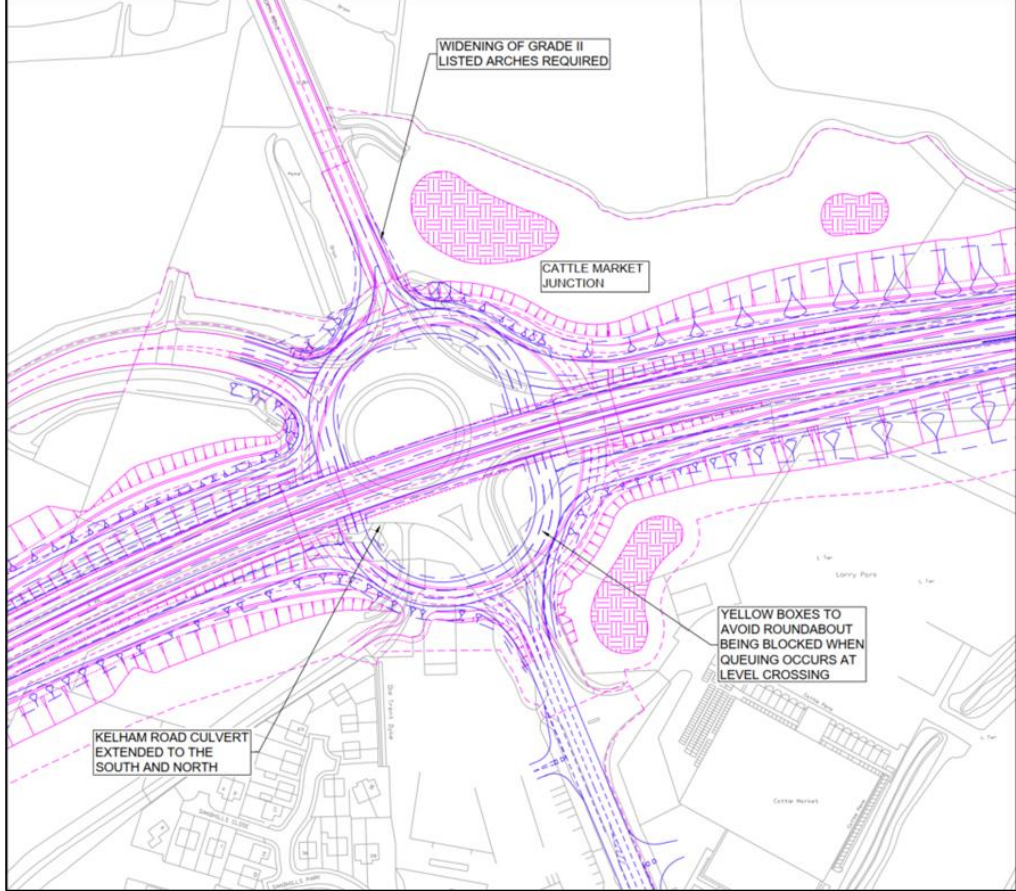
design change, are discussed below in Table 3-10. Further details are also available in the Consultation Report [APP-028].

Table 3-10: Design developments from the Option 2 Modified design (preferred route announcement) to the statutory consultation design

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
Farndon roundabout		
As part of the Option 2 Modified design, it was proposed that the existing footprint of the Farndon roundabout was to be maintained, and the roundabout partially signalised to improve traffic flows. Farndon Underpass, directly north of the roundabout, was proposed to be extended to make way for the new widened A46.	The existing footprint of the roundabout will still be maintained and the roundabout will still be partially signalised. Lane designation and traffic signal phasing has been reviewed as part of the design development, to improve flows. The new widened A46 will now pass over the existing Farndon Underpass so there is no need to extend it.	The revised design presented at statutory consultation has the potential to result in the following environmental benefits compared to the Option 2 Modified design: <ul style="list-style-type: none">Biodiversity: a smaller footprint and a reduced construction effort results in less habitat loss and lower levels of disturbance.Flood risk and drainage: a reduction in proposed embankment footprint reduces floodplain compensation requirements. The smaller footprint allows for larger surface water storage features such as basins and swales. There is also a reduced impermeable area in comparison to the Option 2 Modified design which has flood risk benefits.Air quality: A smaller footprint reduces the construction effort required as there are no changes to the underpass and therefore no construction emissions related to this element. Changes to the
A sketch of Farndon Junction design developments (blue) against the Option 2 Modified design (pink) are below.		

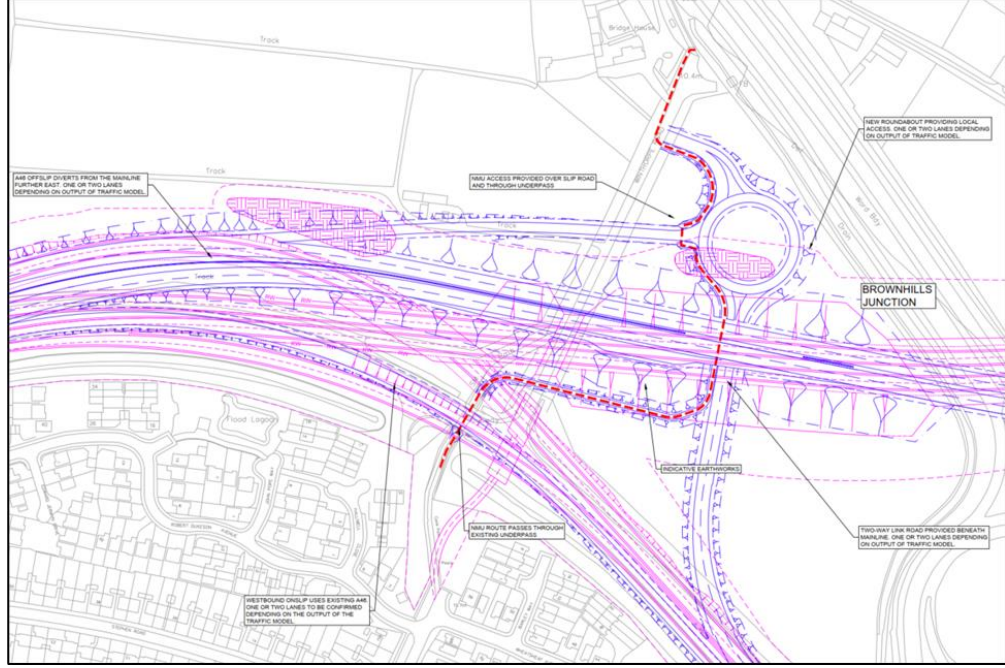
Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		<p>alignment would have minimal impact on air quality concentrations.</p> <ul style="list-style-type: none">• Noise: a 2-metre shift east of the new carriageway, further from noise-sensitive receptors. <p>The revised design presented at statutory consultation has the potential to result in the following environmental disbenefits, although this was also the case with the Option 2 Modified design:</p> <ul style="list-style-type: none">• Flood risk and drainage: an unknown risk regarding the tie-in to the existing Environment Agency flood defence.

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
Cattle Market Junction		
As part of the Option 2 Modified design, it was proposed that the A46 was elevated over an enlarged roundabout at Cattle Market. The diameter of the existing roundabout was approximately doubled to the south and east, with three lanes provided on slip road entries and around the circulatory. The Kelham Road culvert was extended to the north and the south which creates possible impacts to the Grade II listed Smeaton's Arches on the Kelham Road North approach. The layout was originally designed for full signalisation and space was provided for queuing at stop lines. When signalisation was removed the gyratory size was not reduced as this could be done at the next stage.	The A46 is still to be elevated over the Cattle Market roundabout with two single span structures crossing the roundabout on the west and east, with full height reinforced earth walls on the approaches and within the central island (similar to the Option 2 Modified design). The footprint of the roundabout has been reduced and further design amendments will seek to reduce the impact on the listed Smeaton's Arches to the north.	The revised design presented at statutory consultation has the potential to result in the following environmental benefits compared to the Option 2 Modified design: <ul style="list-style-type: none">Heritage: a smaller roundabout reduces the impact on the listed arches directly to the north of the roundabout.Archaeology: a smaller roundabout helps maintain a suitable distance between the structure and the Civil War redoubt Scheduled Monument 550m south-east of Valley Farm. This also helps reduce the impact on setting.Biodiversity: a smaller roundabout footprint decreases the amount of existing habitat loss.Geology and soils: a smaller roundabout leads to less disturbance of soils.Flood risk and drainage: a smaller footprint allows for larger surface water storage features such as basins and swales. This design development reduces the amount of impermeable area which has flood risk benefits. Increasing the area available for Blue-
A sketch of the Cattle Market Junction design developments (blue) against the Option 2 Modified design (pink) are below.		

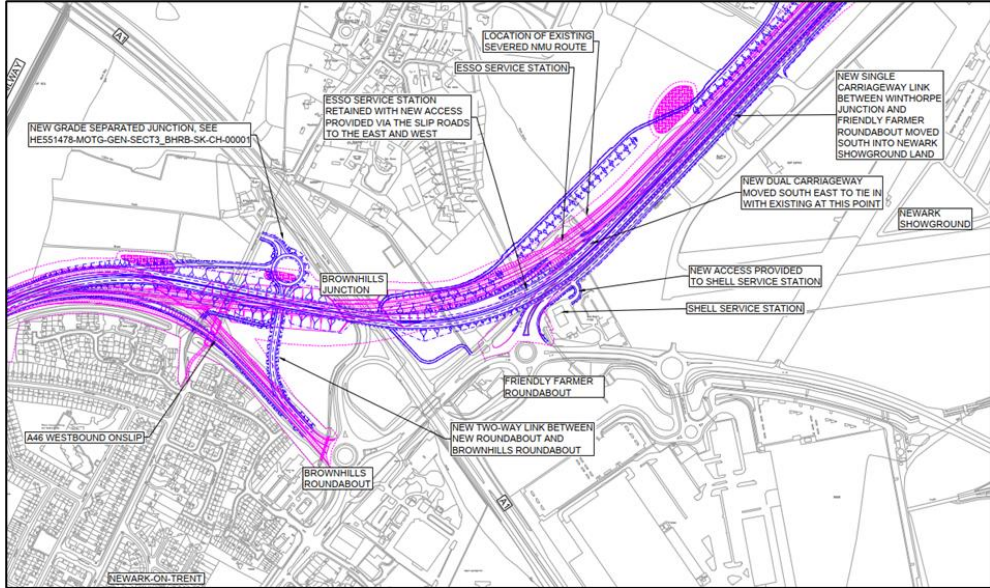
Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		<p>Green infrastructure also provides habitat creation and biodiversity benefits, in addition to further improving the water quality of the road run-off before it is discharged into local watercourses.</p> <ul style="list-style-type: none"> • Air quality: a smaller size results in vehicle emissions being moved further away from residences on Sandhills Close, though no exceedances of air quality objectives were predicted at this location during early stages of assessment. <p>The revised design presented at statutory consultation has the potential to result in the following environmental disbenefits compared to the Option 2 Modified design:</p> <ul style="list-style-type: none"> • Flood risk and drainage: attenuation basins are located in the LWS. If the basin were moved away from the LWS, direct run-off would be needed against the natural fall of the land as well as the highway. This can then lead to piped runs at unrealistic, and dangerous to construct and inspect depths or swales having to be raised to allow flows to be conveyed towards the basin. This would increase the

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		<p>construction volume and therefore require a greater FCA. A swale from the basin would allow discharge into the receiving watercourse meaning it would be flowing back the way it came. As a result, the basin and the outfall swale would have to be raised to allow it flow to the associated receptor. Therefore, an alternative is not possible.</p>
Brownhills slip road		
<p>As part of the Option 2 Modified design, the A46 westbound onslip was not located on the existing A46 and would have required the existing A46 carriageway from 200 metres north of Brownhills roundabout to be widened. This, in turn, would have required the removal of all existing vegetation and moved traffic closer to residential receptors. The proposed A46 was raised around 7 metres above the existing A46 throughout the junction, with the northbound off slip to Brownhills Roundabout passing beneath it via a skewed underpass. Three underpasses were provided beneath the slip roads and mainline to maintain pedestrian access, creating a low point beneath the southbound offslip that would have presented</p>	<p>As part of the development of the design, the A46 southbound onslip from Brownhills roundabout now utilises the existing A46 carriageway footprint, allowing the existing vegetation to be retained. The A46 northbound offslip will divert from the mainline further north, tying into a new small roundabout near the A1. This provides access to the properties and businesses to the north, and links to Brownhills roundabout via a new underpass that crosses perpendicular beneath the mainline.</p> <p>The current Scheme design proposes one underpass rather than four to maintain access to properties and businesses to the north and</p>	<p>The revised design presented at statutory consultation has the potential to result in the following environmental benefits compared to the Option 2 Modified design:</p> <ul style="list-style-type: none"> • Biodiversity: retention of existing vegetation and associated habitat, on the southern side of the A46 that would otherwise have been lost. • Landscape: retention of existing vegetation on the southern side of the A46 acting as screening benefit from existing visual receptors that would otherwise have been lost had vegetation removal been required.

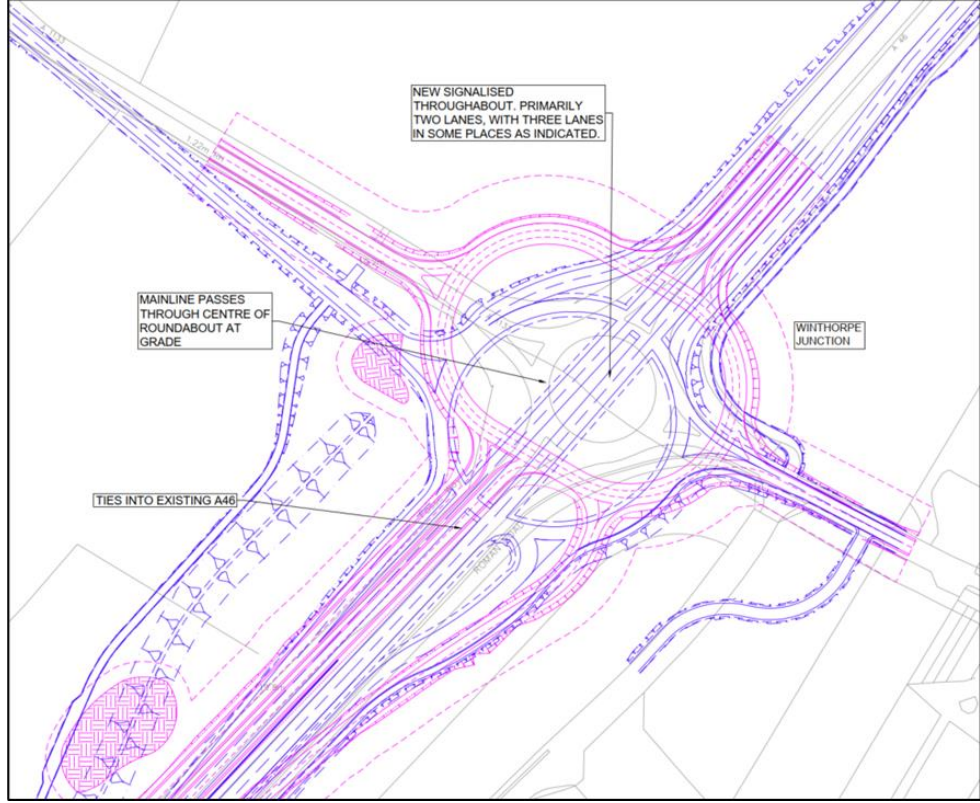
Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
<p>drainage and construction challenges. Accommodation access was provided beneath the A46 alongside the A1.</p>	<p>for walkers and cyclists creating a more attractive route for pedestrians. The underpass for the northbound offslip passes perpendicular beneath the mainline rather than at a skew and is located near the A1 crossing, minimising the need for a high embankment in front of the southern properties. The current Scheme design reduces the length of mainline embankment and existing vegetation is retained on the southern side of the A46. The current Scheme design provides more space between Newark-on-Trent and the mainline, making it easier to retain the existing screening and possibly provide additional amenity space. This design eliminates the need for a tight radius on the northbound offslip which presented safety concerns and would likely have resulted in a departure from standards.</p>	<ul style="list-style-type: none"> • Flood risk and drainage: a reduction in earthworks within the floodplain, reducing floodplain compensation requirements. The smaller footprint allows for larger surface water storage features such as basins and swales. The revised design also presents a reduced impermeable area bringing flood risk benefits. • Noise: potential noise benefits associated with the removal of the northbound offslip and southern slips from the new roundabout to Brownhills roundabout to a position further from residential properties southwest of the junction. <p>The revised design presented at statutory consultation has the potential to result in the following environmental disbenefits compared to the Option 2 Modified design:</p>
<p>A sketch of the Brownhills Junction design developments (blue) against the Option 2 Modified design (pink) are contained below.</p>		<ul style="list-style-type: none"> • Geology and soils: additional land take resulting in increased disturbance of Grade 2 and 3 agricultural soils. • Water quality: the proposed roundabout is located adjacent to an established drain and there will be an increased risk of surface water runoff directly into this drain.

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		<ul style="list-style-type: none"> • Flood risk and drainage: the additional roundabout and proposed new roads at Brownhills Junction would be 2 metres above existing ground levels which is within an area of flood risk. Impacts to floodplain compensation requirements and flood propagation would need to be managed. • Landscape: greater incursion into Winthorpe Open Break with introduction of new roundabout. Proposed works closer to residential receptor at Bridge House.
A1 to Winthorpe alignment		
<p>As part of the Option 2 Modified design, the realigned A46 passed just to the north of the existing A46, passing over the footprint of the existing Esso interchange service station. The proposed westbound carriageway uses the existing A46 eastbound carriageway and the two-way link</p>	<p>The proposed A46 passes south of the Esso interchange service station and ties back into the alignment of the existing A46. The space between the two-way link and existing dual carriageway has been reduced to allow it to be sited within a similar corridor. This allows</p>	<p>The revised design presented at statutory consultation has the potential to result in the following environmental benefits compared to the Option 2 Modified design:</p>

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
<p>provided between Friendly Farmer roundabout and Winthorpe junction uses the existing A46 westbound carriageway.</p>	<p>the Esso interchange service station to be retained with new access provided via slip roads to the east and west. A new egress is also provided from the Shell service station to the south. It was envisaged that an access would also be provided from the two-way link, but to improve safety and reduce land take it was decided that only the existing access from the A17 would be utilised.</p> <p>The A46 mainline moves further from Winthorpe. The design fully reuses a large section of the existing A46 and moves the A1 crossing further away from Winthorpe. It also moves the new link road between Friendly Farmer and Winthorpe roundabouts largely offline to the east of the existing carriageway to the south of the A46. Drainage attenuation is reduced as the new carriageway surface is decreased.</p> <p>However, the design requires amendments to the Shell service station's access and increases the skew of the A1 bridge (the total span remains similar to the Option 2 Modified design as the bridge no longer has to span over the access road). The slip roads to and</p>	<ul style="list-style-type: none"> • Heritage: reduced adverse effects on the Winthorpe Conservation Area as the road alignment is moved further south. • Biodiversity: the movement of the carriageway link between Winthorpe roundabout and Friendly Farmer roundabout to the south aims to protect a small woodland plot on the north side of the A46. The reduced footprint results in less overall habitat loss. • Flood risk and drainage: A smaller footprint allows for larger surface water storage features such as basins and swales. Increasing the attenuation potential of blue-green infrastructure reduces the need for separating from the landscape and ecological mitigation by integrating these benefits into the pond, basins and wetlands. This would not be possible with separated attenuation features, such as attenuation storage tanks, a hard engineering alternative with a higher carbon footprint. • Noise: potential benefit to south Winthorpe by moving the carriageway

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
<p>A sketch of the A1 to Winthorpe design developments (blue) against the Option 2 Modified design (pink) are below.</p> 	<p>from the Esso interchange service station are required on a bend.</p>	<p>further from the village. Noise bunds proposed between farm access/public footpath and the A46 reduce noise impact.</p> <p>The revised design presented at statutory consultation has the potential to result in the following environmental disbenefits compared to the Option 2 Modified design:</p> <ul style="list-style-type: none"> • Biodiversity: severance of active bat commuting route along small stream within tree line west of Esso service station. Proposed new access road to go through small, woodland plot that has value for bats and nesting birds. • Water quality: new access roads (for Esso and Shell service stations) proposed over existing minor watercourse, which could cause morphological changes or shading affecting aquatic ecology. • Air quality: the movement of vehicles and associated emissions closer to a residential property (The Lodge) located to south-east of the existing Friendly Farmer roundabout, though no exceedance of air quality objectives

Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		were predicted at this location during the options appraisal stages.
Winthorpe design		
As part of the Option 2 Modified design, Winthorpe roundabout was significantly enlarged and fully signalised. An additional fifth arm was provided for the two-way link to the Friendly Farmer roundabout.	As part of the design development, upon review of the proposed junction by the traffic team, the design at Winthorpe was optimised to provide greater resilience to all highways that enter or leave the junction. As such, a ‘through-about’ option has been proposed in an aim to improve traffic flows. In this option the roundabout has been enlarged and partially signalised with the mainline passing through the middle at-grade. The design improves traffic flows and aligns more closely to the Scheme objectives. The configuration of the arms into the roundabout is improved which may provide safety benefits. There is less impact on the land to the north and east of the existing roundabout.	The revised design presented at statutory consultation has the potential to result in the following environmental benefits compared to the Option 2 Modified design: <ul style="list-style-type: none">• Water quality: a reduced footprint is likely to result in less surface water runoff and the associated adverse effects.• Flood risk and drainage: a potential reduction in hardstanding impermeable surface and associated drainage requirements.• Noise: potential for a slight improvement in noise climate in the vicinity of the junction resulting from a smaller roundabout, although there are no properties or noise-sensitive receptors in the immediate location.• Landscape and Visuals: Reduced impact associated with smaller roundabout, reducing scale of built elements within the landscape.
A sketch of the Winthorpe junction design developments (blue) against the Option 2 Modified design (pink) are contained below.		


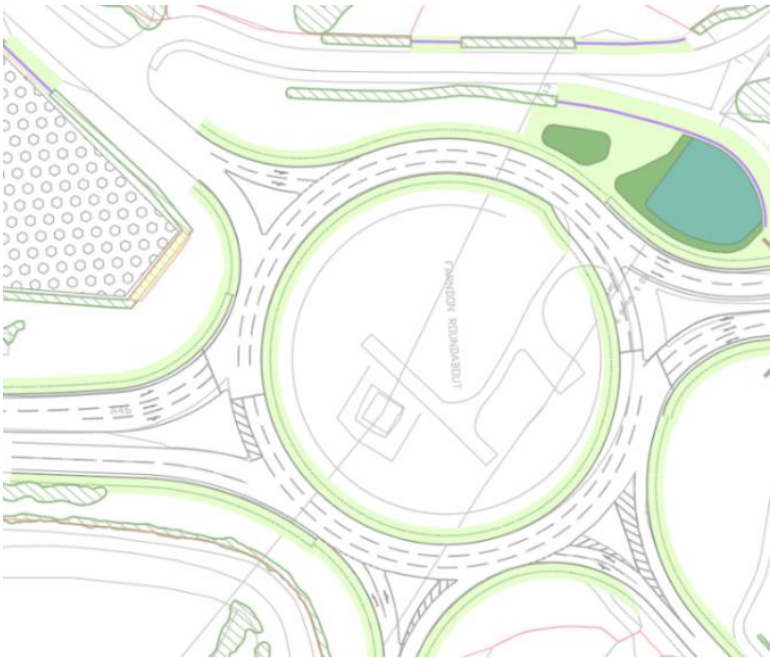
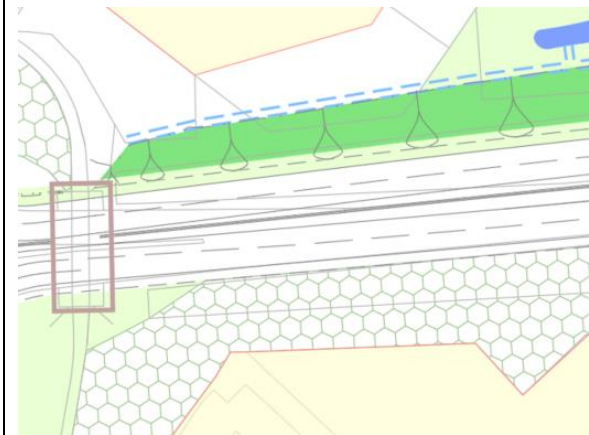
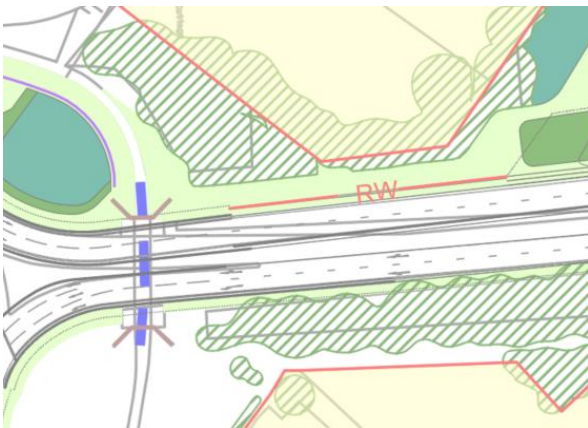
Option 2 Modified design (preferred route announcement)	Design development following the preferred route announcement to statutory consultation	Summary of environmental effects
		<p>The revised design presented at statutory consultation has the potential to result in the following environmental disbenefits compared to the Option 2 Modified design:</p> <p>No disbenefits identified.</p>




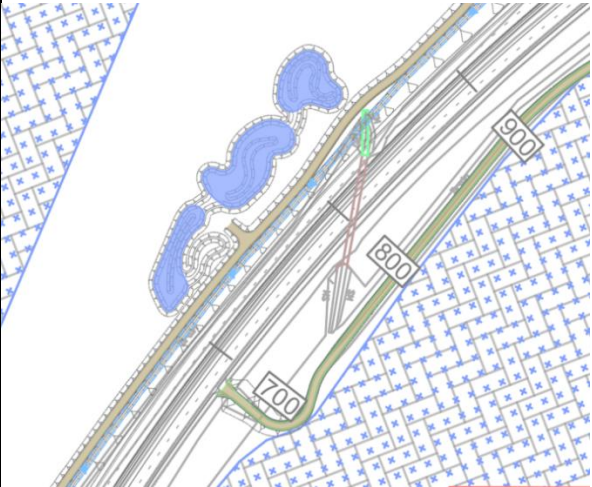
- 3.3.104 The environmental effects of each design development helped inform the decision on those to be taken forward from Option 2 Modified Design to the Scheme design following the preferred route announcement to statutory consultation. Regarding the evolution since the Option 2 Modified design, the Scheme presented fewer adverse effects to heritage, archaeology, biodiversity, noise, air quality, flood risk and drainage. This has been achieved by reducing the footprint 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.

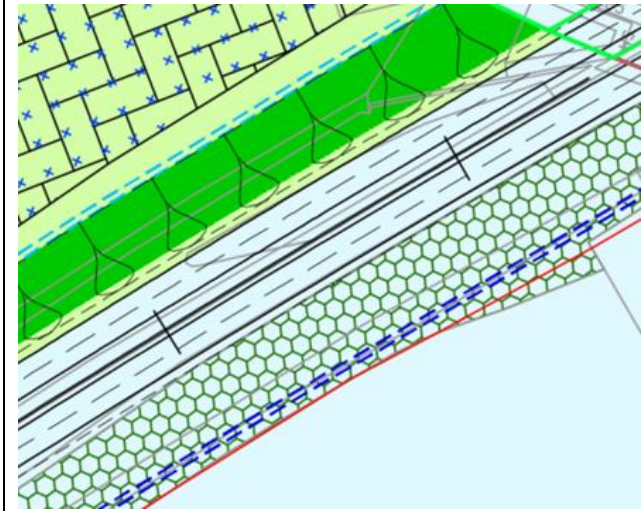
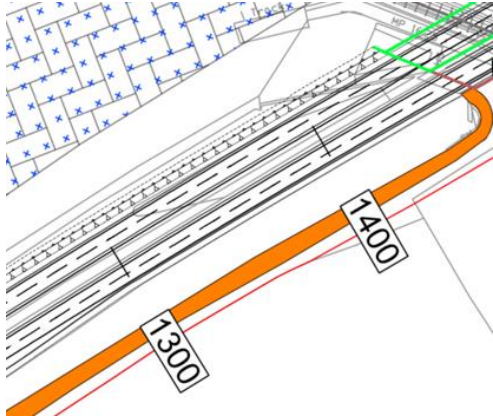
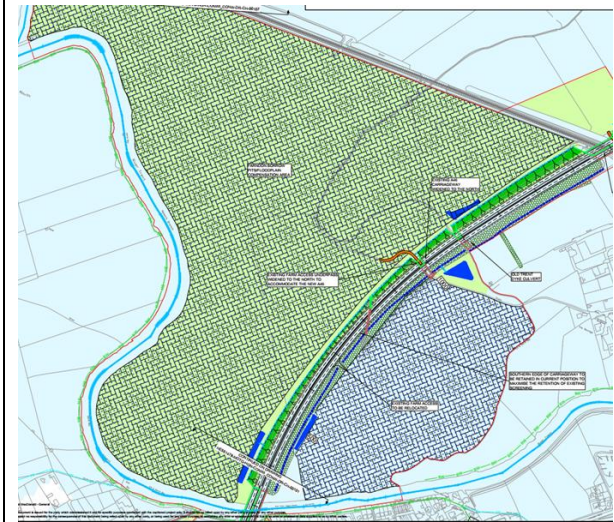

Design development following statutory consultation and targeted consultation

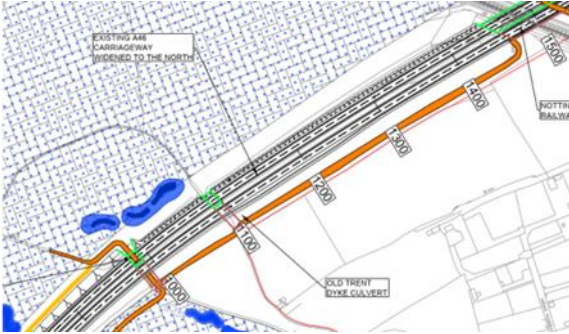

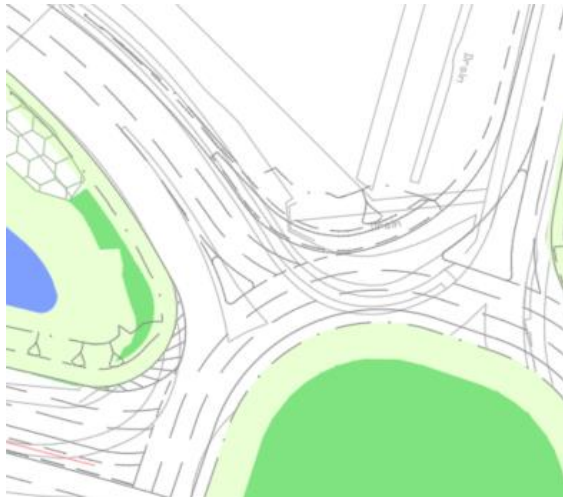
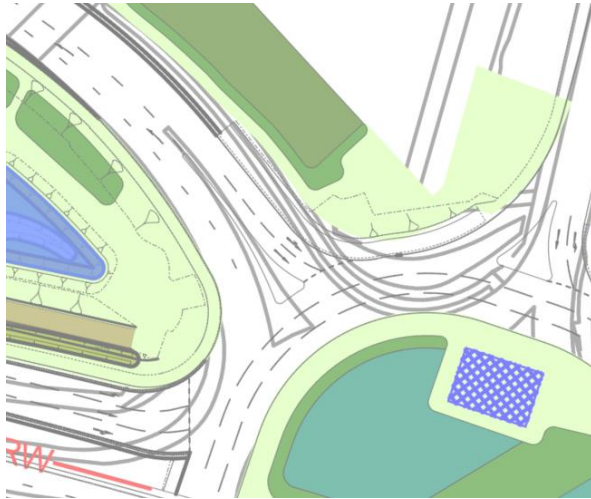
- 3.3.105 This section summarises the design developments that have taken place following the statutory consultation and the targeted consultation to produce the design which forms the application for development consent. These design developments have been integrated into the current Scheme presented and therefore the design that has been assessed within this ES.
- 3.3.106 The design developments that have taken place between statutory consultation and the design submitted at the point of the development consent application are detailed in Table 3-11 below.





Table 3-11: Design developments following the statutory consultation




Statutory Consultation Design	Revised design	Summary of environmental effects
Farndon Roundabout		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The northern side of Farndon Roundabout has been widened towards the inside of the roundabout. This is to accommodate for spiralized road markings which traffic modelling shows improves the traffic flows, as it allows vehicles to more easily get in their allocated lane to exit onto Fosse Way towards Newark. The width has been reduced from 3 to 2 lanes in this area.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Water quality: a reduced footprint which is likely to result in less surface water runoff and the associated adverse effects.• Flood risk and drainage: a potential reduction in hardstanding impermeable surface and associated drainage requirements.• Air quality: the change in the roundabout layout has reduced the amount of stationary vehicles on the roundabout, thereby reducing concentrations of NO₂ and PM₁₀, minimising the adverse effect by moving vehicles. <p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Retaining wall near Farndon		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>A retaining wall has been added on the west side of the road between the existing Farndon Underpass for a length of around 100m. This change originated from consultation with the residents of Crees Lane who stated a preference for retaining more land and trees/vegetation in their rear gardens.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Biodiversity: vegetation loss reduced, which is likely to be of use to nesting birds and commuting bats.• Landscape: less permanent land take is required due to the steep gradients and footprint of the junction, allowing a larger amount of land to be retained in Crees Lane residents' gardens. Reduced vegetation loss.• Population and Human Health: reduced permanent acquisition of Crees Lane residents' gardens. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design, although it is not considered that these effects would result in additional significant adverse effects:</p> <p>Landscape: a sheet pile retaining wall can be difficult to integrate with the landscape, other options will be considered as part of the detailed design. Planting on top of embankment above retaining wall not feasible.</p>
Access track near Farndon		


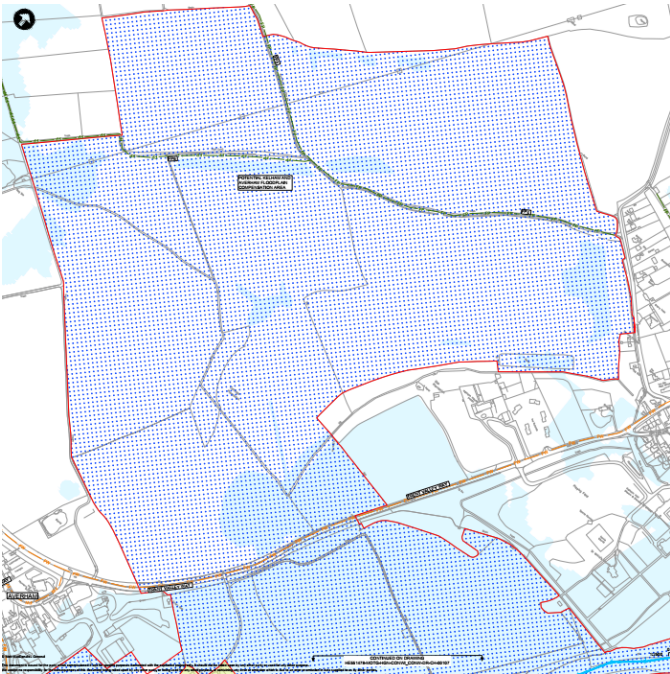

Statutory Consultation Design	Revised design	Summary of environmental effects
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The maintenance track (coloured light brown) used to enter Windmill Viaduct and the ponds near Farndon has been moved from the access being provided from Crees Lane to the access being provided from Fosse Way as shown below. This is to retain more of the vegetation that screens the properties on Crees Lane from the road, and because it was identified that the route now proposed is the one currently being used to access Windmill Viaduct.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> • Biodiversity: vegetation loss reduced, which is likely to be of use to nesting birds and commuting bats. • Landscape: vegetation that screens residential properties from the road now retained. • Population and Human Health: the revised design reduces the loss of screening vegetation from Crees Lane residents' gardens. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Accommodation works access from mainline		
<p>Access to the north of Windmill viaduct and to farmland was shown along Tolney Lane.</p> 	<p>An accommodation works access has been added from the mainline at Chainage 690. This has originated from consultation with the land owner who stated it was the only way to access their land due to safety issues with using Tolney Lane. No alternatives were available so a new access from the mainline was added. This utilises the existing access so vegetation clearance should be minimal, however it is possible that some will be required to accommodate merge/diverge tapers and sight lines. The location of this access track is shown below.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> • Population and Human Health: the farmer and future maintenance operatives will not be subject to increased traffic use / risks by the introduction of a new access track. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design, although it is not considered that these effects would result in additional significant adverse effects:</p> <ul style="list-style-type: none"> • Biodiversity: whilst minimal, vegetation clearance and associated habitat will be lost due to the introduction of an access track. • Landscape: Whilst minimal, vegetation clearance may lead to a reduction in screening value currently afforded for local visual receptors, opening up views to the A46.
Earthwork slopes		

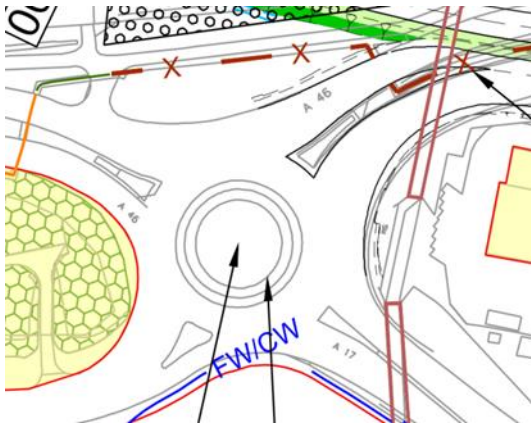
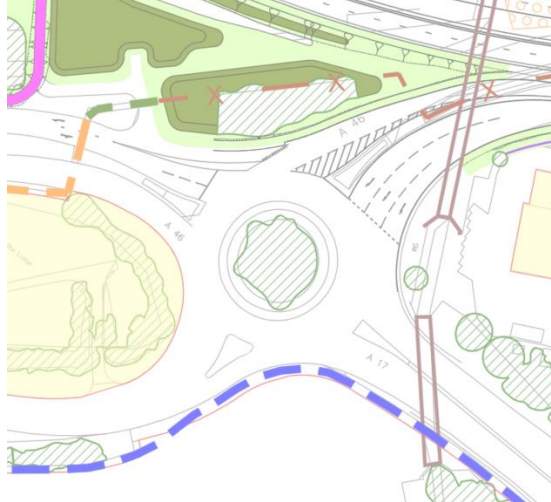

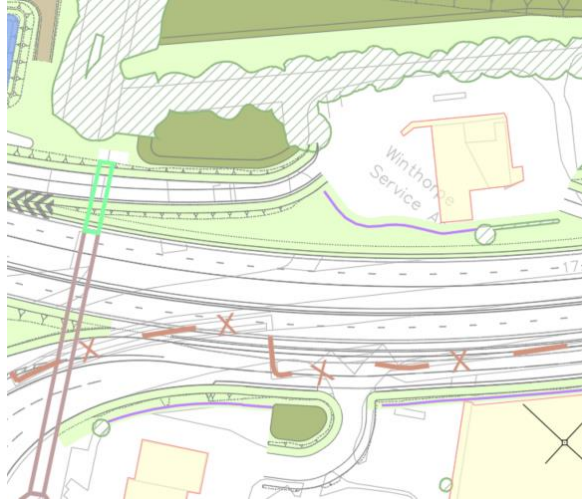
Statutory Consultation Design	Revised design	Summary of environmental effects
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>Earthwork slopes have been updated along the length of the route. The changes largely involve steepening earthworks to reduce the amount of flood compensation required and to utilise the existing earthworks footprint to reduce settlement. A typical reduction in footprint can be seen below.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Flood risk and drainage: steepened earthworks reduces floodplain compensation requirements.Carbon: reduced carbon due to less fill needed. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design, although it is not considered that these effects would result in additional significant adverse effects:</p> <ul style="list-style-type: none">Landscape: Planting will not be possible on steepened earthworks and therefore screening value on upper slopes that could be achieved with the original design would no longer be possible.
Farndon Borrow Pits / Floodplain Compensation Area		
<p>A sketch of the statutory consultation design is contained below. The flood modelling had not been completed and the extent of flood compensation land shown was for the worst case scenario determined during an earlier stage of the Scheme. The land shown as potential borrow pit assumed ahead of site investigation works that it had the potential to be used as earthworks fill material for the Scheme.</p> 	<p>Following a geotechnical review of the Farndon East and West Borrow Pit areas, it was noted that the material in the location for the Farndon West borrow pit would likely be unsuitable to be used as embankment fill, and a revised borrow pit strategy would be required for these two areas. A summary of the changes is below:</p> <ul style="list-style-type: none">Farndon East Borrow Pit and FCA will be excavated for use as a borrow pit (up to 4m). As part of the scheme design, Farndon East FCA would be a permanent lake with fish passages for connectivity. Grassland and planting is proposed around the edges where possible.Farndon Borrow Pit West is available for optimal habitat creation with high spots being lowered for floodplain compensation (up to 1.4m) and wetland creation. Details are shown on Figure 2.3 (Environmental Masterplan) of the ES Figures (TR010065/APP/6.2). 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Biodiversity: impact on the priority habitat situated to the east of Old Trent Dyke has been avoided due to the decrease in the Farndon Borrow Pits / Floodplain Compensation Area.Biodiversity: Grass planting will be provided around the edges of the lake where possible and habitat creation has been optimized due to the lowering of land for floodplain compensation and wetland creation.Fish escape passages are to be incorporated at Farndon East and West (following consultation with the Environment Agency, the specific number, location and design of fish escape passages will be finalised during detailed design and the proposals will be tested in the fluvial hydraulic model to assess the potential impact to receptors).Material Assets and Waste: Possibility for surplus material won as a result of lowering the land for the floodplain compensation area at Farndon West to be used to create shallow margins at Farndon East Lake to enable vegetation to establish around the edge of the lake.Geology and Soils: impact on agricultural land and soils reduced due to the reduced size of the works. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>


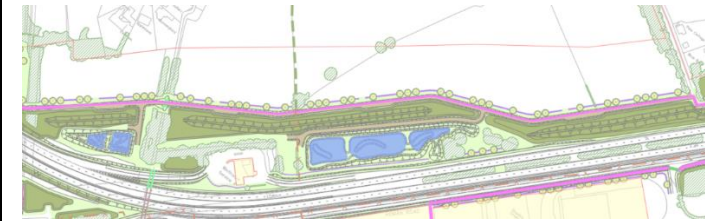
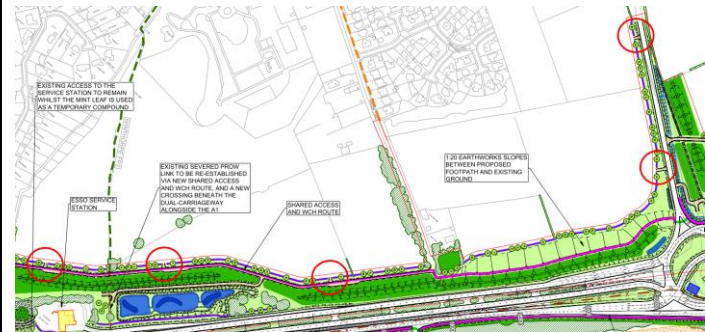
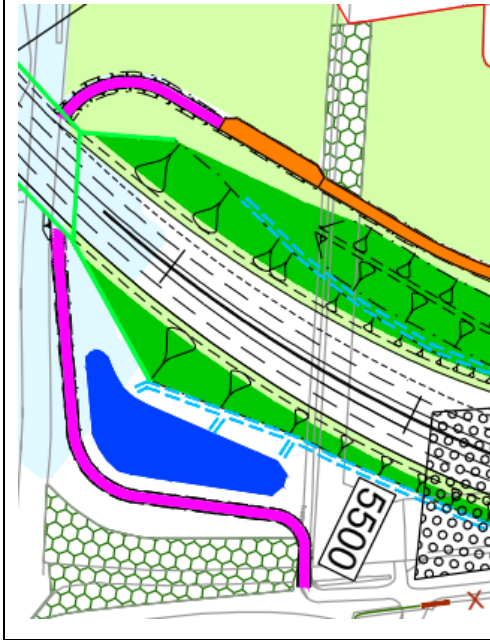

Statutory Consultation Design	Revised design	Summary of environmental effects
Access track to Nottingham Lincoln Railway Line West Crossing		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The access track from Chainage 1000 to the Nottingham Lincoln Railway Line West Crossing has been moved from the south to the north of the A46 due to the limited space available to the south. Providing the track in the original location would have removed a large swathe of existing vegetation at the toe of the existing embankment.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Landscape: Existing vegetation retained. Biodiversity: Existing vegetation and associated habitat retained. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
A617 Entry to Cattle Market Roundabout		
<p>The layout showed 3 lanes on the entry to the roundabout.</p> 	<p>The A617 arm of Cattle Market Roundabout has been reduced from three lanes to two lanes, thereby reducing the overall footprint of the junction. This is following completion of the Preliminary Design traffic modelling to improve flows around the roundabout. In turn this also reduces the impact on the priority habitat area located to the north between the A617 and A616 arms of the roundabout.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Biodiversity: impact on the priority habitat situated to the east of Cattle Market Roundabout has been avoided due to the decrease in the Scheme footprint. Landscape: Reduced land take. Carbon: reduced carbon due to less fill needed. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Great North Road south of Cattle Market Roundabout		
<p>The layout did not include walking and cycling crossing points and the location of junctions were to be agreed with Newark & Sherwood District Council.</p>	<p>Following liaison with Newark & Sherwood District Council, the layout of the highway has been agreed. The new access to the lorry park will be signalised and two islands have been provided to allow walkers and cyclists to cross the road safely. A sketch of the agreed layout is shown below.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Population and Human Health: safety for walking and cycling users been instated by the modification of the walking and cycling crossing points and the location of junctions.





Statutory Consultation Design	Revised design	Summary of environmental effects
		<p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Access tracks		
<p>Access tracks were shown to key infrastructure and not to the drainage and landscape features along the Scheme.</p> 	<p>Through ongoing discussions with the Applicant and users to understand their needs, the access tracks and swales have been fully modelled along the length of the Scheme. They have also been co-ordinated with the landscape design proposals and to avoid unnecessary vegetation clearance. Overall, the length of access tracks has reduced from what was previously anticipated. This is due to consolidation of access tracks to allow routes to access multiple assets, thereby removing any unnecessary duplication. Access tracks are assumed to be up to 4 metres wide and raised slightly above existing ground level.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Population and Human Health: safety for access to drainage features and structures for maintenance works has been re-instated by the introduction of new access tracks. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design, although it is not considered that these effects would result in additional significant adverse effects:</p> <ul style="list-style-type: none">Water quality: an increased footprint which is likely to result in more surface water runoff and the associated adverse effects.Flood risk and drainage: a potential increase in hardstanding impermeable surface and associated drainage requirements.
Drainage ponds		



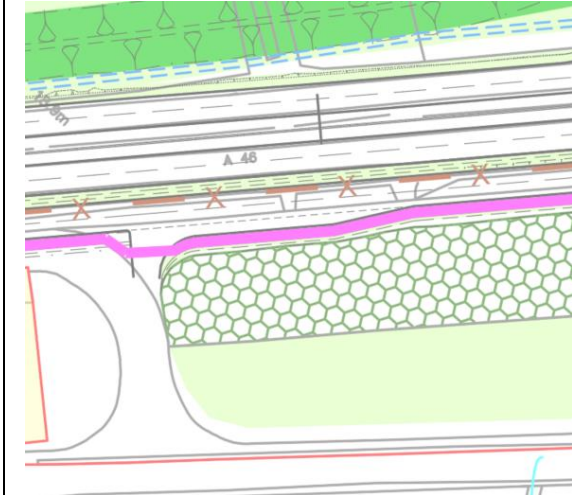
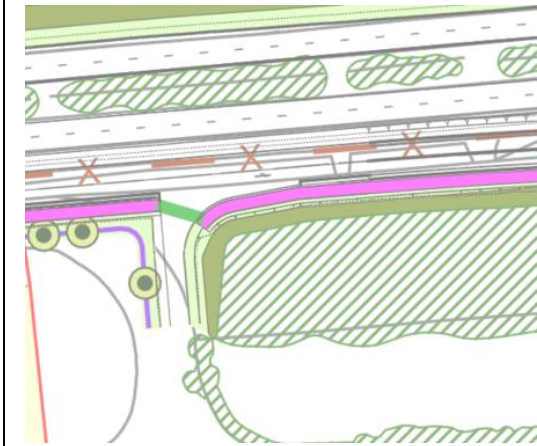
Statutory Consultation Design	Revised design	Summary of environmental effects
<p>Ponds were indicatively shown along the route within each of the catchments.</p> 	<p>Pond locations, pond sizes and locations of drainage ditches have been amended and are detailed on the Drainage Plans (TR010065/APP/2.10) and General Arrangement Drawings (TR010065/APP/2.5). The typical changes include:</p> <ul style="list-style-type: none">• Features such as outfalls moved to reduce impact on existing vegetation and trees.• Attenuation areas removed where not required and areas sized to suit predicted flows. 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Flood risk and drainage: A revised design allows for larger surface water storage features such as basins and swales. Increasing the attenuation potential of blue-green infrastructure reduces the need for separating from the landscaping and biodiversity enhancements by integrating these benefits into the pond, basins and wetlands. This would not be possible with separated attenuation features, such as attenuation storage tanks, a hard engineering alternative with a higher carbon footprint.• Landscape: the revised design has allowed for greater integration of the drainage features into the landscape.• Biodiversity: the introduction of a sustainable drainage design and blue green infrastructure design allows for enhanced biodiversity opportunities. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Brownhills right turn		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The right turn to access the kennels from Brownhills Roundabout has been amended due to concerns raised by stakeholders and during the Road Safety Audit, that the previous layout was confusing and there was a risk of vehicles unintentionally using the wrong lane, potentially leading to an accident.</p> <p>The right turn has therefore been modified so that there is a more noticeable right turn that occurs further down the link, reducing confusion. Hatched road markings will be used to direct traffic.</p> <p>The width of the carriageway approaching Brownhills roundabout has been reduced in the same location.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Population and Human Health: safety for vehicle users has been improved by the modification of the Brownhills right turn.• Biodiversity: Existing vegetation and associated habitat retained. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>



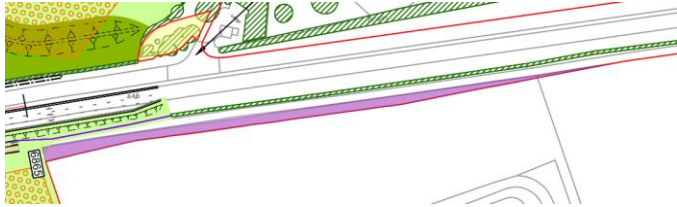
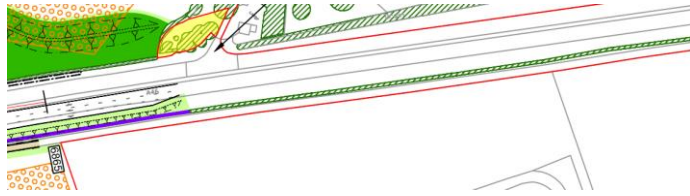
Statutory Consultation Design	Revised design	Summary of environmental effects
		
Kelham and Averham Floodplain Compensation Area (FCA)		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The Kelham and Averham FCA has decreased in footprint to reflect that a more specific site for the FCA has been chosen, referred to as design refinement. It was never intended for the entirety of the area shown at statutory consultation to be utilised. The refined area is shown below. This site was chosen in consultation with the relevant stakeholders, with consideration for the engineering constraints of different site options. Additionally, the location of a proposed culvert and maintenance access track associated with the floodplain compensation are also shown.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Carbon: Reduced carbon footprint due to a reduction in the area of land needed to provide floodplain compensation.• Landscape: reduction in the size of the FCA will reduce visual impacts on the surrounding area and potential alterations to landscape character. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design, although it is not considered that these effects would result in additional significant adverse effects:</p> <ul style="list-style-type: none">• Heritage and archaeology: Adjacent to Kelham Hall is a Grade II listed boundary wall, which forms the bank of a ditch that will convey water from the FCA. There is a risk of damage during initial clearance and subsequent maintenance of the existing ditch that runs in front of this. Geophysical surveys highlighted a number of potential historic settlement sites within the conservation area portion of the proposed FCA. However, there are also likely to be historic settlement sites throughout the proposed FCA site.• Landscape: Visual impacts to Kelham Conservation Area and properties in Averham due to the encroachment of the floodplain compensation area in the conservation area. Impacts would be limited due to intervening vegetation.• Population and Human Health: Disruption to A617 to install new culvert connection, likely requiring the construction of a temporary road to maintain the key A617 route during the works.


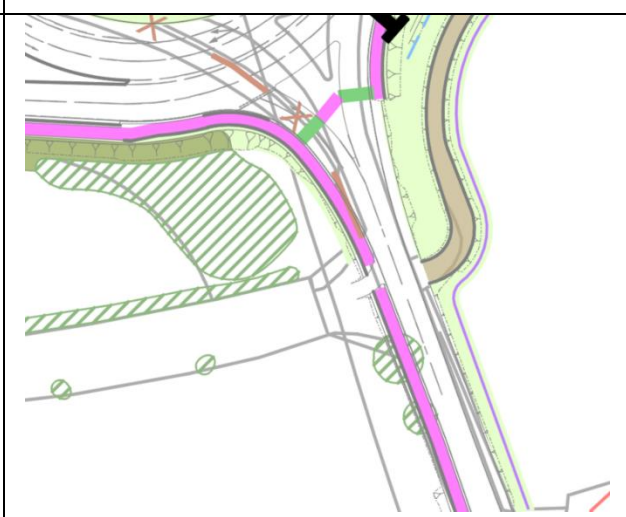


Statutory Consultation Design	Revised design	Summary of environmental effects
Connection to Friendly Farmer Roundabout		
<p>There was a free flow link between Friendly Farmers roundabout and the new Friendly Farmer Link. Concerns were raised by stakeholders and in the Road Safety Audit that this could cause conflicts between the free flow link and the roundabout merges.</p> <p>A sketch of the statutory consultation design is contained below.</p> 	<p>The design has been amended to show three lanes at the give way line, rather than maintaining the free flow link. An indicative layout of this is shown below, prior to the full road marking design being completed. The surfacing area has not increased.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Population and Human Health: safety for vehicle users have been improved by the modification of the Friendly Farmer roundabout. Landscape: Allows increased opportunities for planting. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Access to interchange service station		
<p>The slip road to access the interchange service station went straight into the car park. Concerns were raised by stakeholders and in the Road Safety Audit that this could cause accidents by vehicles travelling too fast into the service station.</p> <p>A sketch of the statutory consultation design is contained below.</p> 	<p>This has been addressed by narrowing the end of the slip road and introducing a tighter radius to slow vehicles down.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <p>No benefits identified.</p> <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Accommodation works track and field accesses south of Winthorpe		
<p>The General Arrangements showed an accommodation works access track between the A46 and Winthorpe which provided access to the fields in this location and the proposed walking / cycle route that passes beneath the A46 adjacent to the A1.</p> <p>A sketch of the statutory consultation design is contained below.</p>	<p>This track has been retained, however its design has been amended as follows:</p> <ul style="list-style-type: none"> The passing bays have been moved to the other side of the track following feedback from the landowner that they would prefer a straight boundary. The track has been moved north slightly to avoid a veteran tree and minimise the impact on existing vegetation as much as possible. 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Biodiversity: the removal of vegetation likely to be of use to nesting birds and commuting bats, has been reduced. Arboriculture: a veteran tree has been retained in the vicinity of the Scheme.


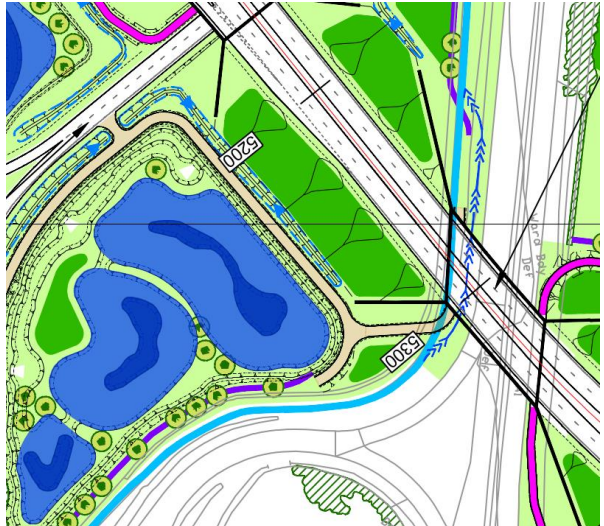
Statutory Consultation Design	Revised design	Summary of environmental effects
	<p>Additionally, the landscape bunds have been amended to avoid as much existing vegetation as possible.</p>  <p>A number of field access have been added to the drawings near Winthorpe to clarify how the fields will be accessed by landowners. The location of these are circled below:</p> 	<ul style="list-style-type: none">• Landscape: the inclusions of landscape bunds will aid landscape integration and visual screening from Winthorpe, including Winthorpe Conservation Area. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Walking / Cycling Route beneath A46		
<p>The route did not allow for the steep gradient (around 10%) that exists from the east down to the A1.</p> 	<p>The revised layout provides a 5% maximum gradient and complies with the Department for Transport inclusive design standards.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Population and human health: improvements to non-motorised user routes due to improved walking and cycling facilities. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• No disbenefits identified.

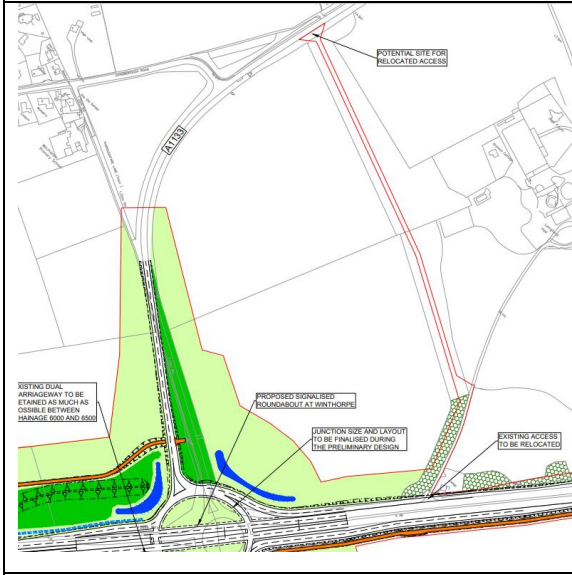

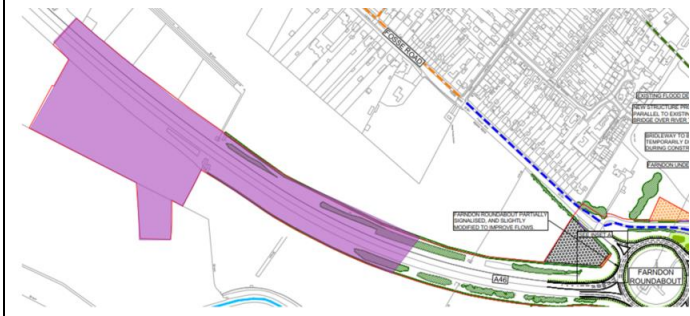
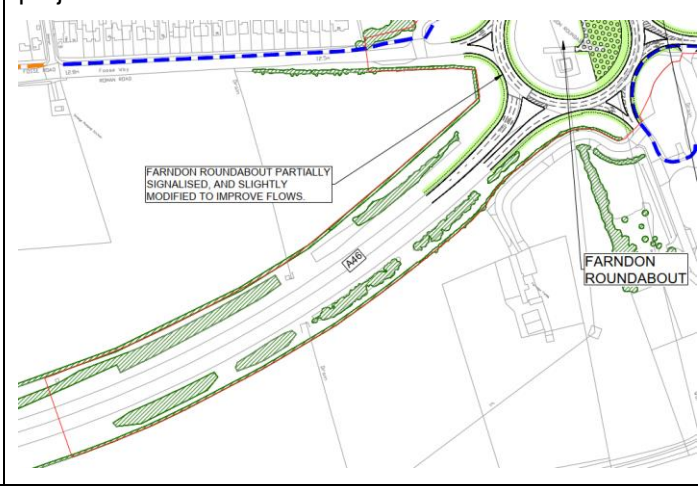
Statutory Consultation Design	Revised design	Summary of environmental effects
Pedestrian Crossing over A46		
<p>The location of the proposed signalised pedestrian crossing over the A46 between Brownhills and Friendly Farmer roundabouts had not been finalised.</p> <p>A sketch of the statutory consultation design is contained below.</p> 	<p>The location of the proposed signalised pedestrian crossing has been moved slightly further to the west of the existing crossing to provide improved sight line, and the existing footway to the south of the A46 shown as being widened slightly within the existing highways boundary to make it more suitable for predicted increased use.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Population and human health: improvements to non-motorised user routes due to improved walking and cycling facilities. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Footway / Cycleway to Winthorpe		
<p>Walking / cycling route only provided to the west of Hargon Lane and access track from A1133.</p> 	<p>Feedback from statutory consultation identified that the residents of Winthorpe would like to see improved walking and cycling facilities to the showground entrance. To achieve this, an additional section of footway / cycleway has been included from the end of Hargon Lane heading to Winthorpe roundabout where it crosses to Drove Lane.</p> <p>The access track from the A1133 has been removed, with the fields and ponds now being accessed from Hargon Lane. Hargon Lane may be widened to the west with a strengthened grass verge to provide passing places for vehicles along the final 250m where there is no existing footway.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Population and human health: improvements to user routes due to improved walking and cycling facilities. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Land between Winthorpe and A46		
<p>The additional land was shown for potential essential mitigation planting.</p>	<p>Following completion of the environmental assessments, the unused land has been removed between Winthorpe and the A46 to a point 5m offset from the back of the hedge to allow for construction access. This is because this land is no longer required to provide essential mitigation as, following completion of</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> No benefits identified.

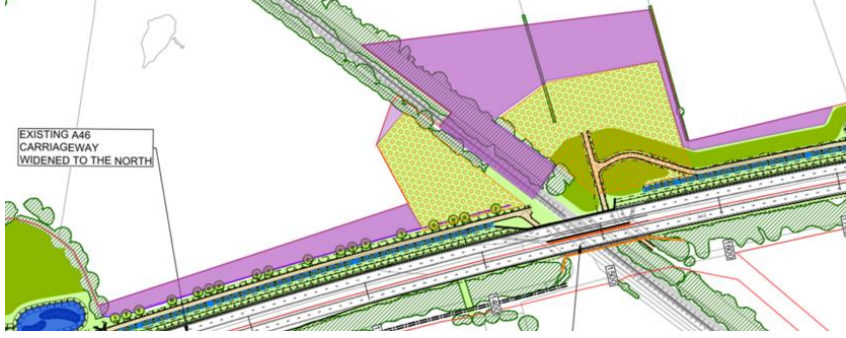
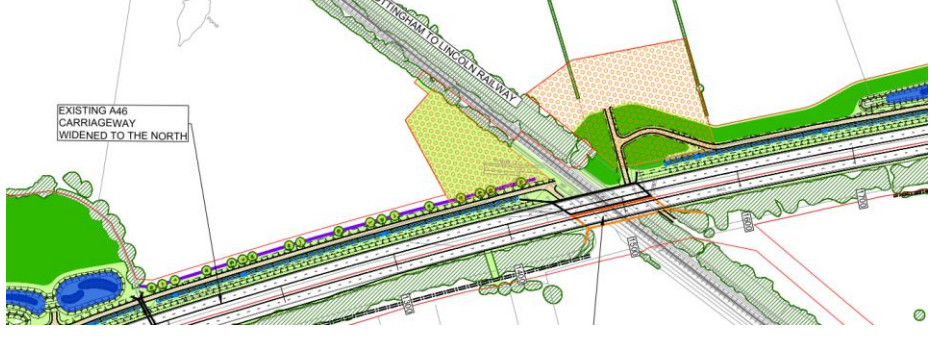
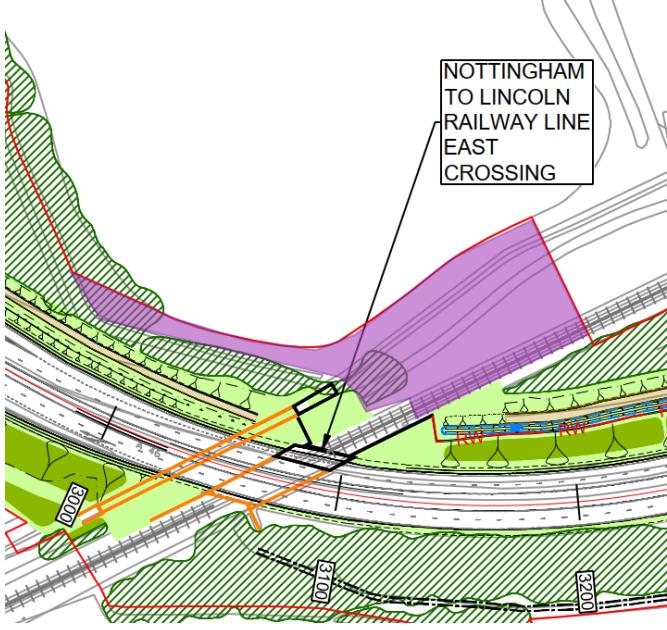
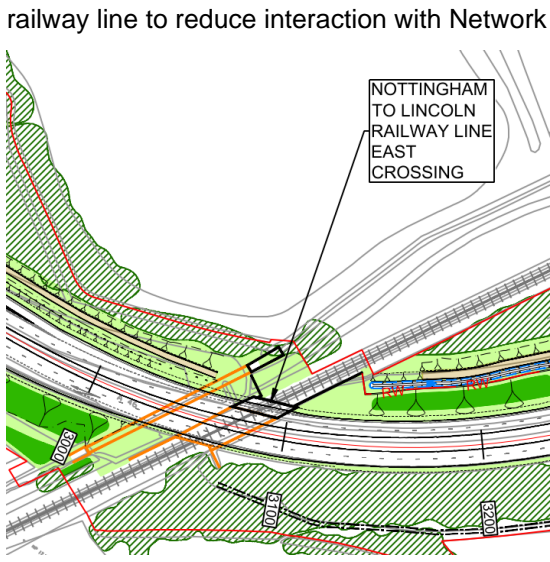
Statutory Consultation Design	Revised design	Summary of environmental effects
	<p>the full environmental impact assessment, it has been determined that sufficient mitigation can be achieved within the revised Order Limits. This land will be returned to the land owner when works are complete.</p> 	<p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Access to Showground from Friendly Farmer		
<p>In the previous design, access was provided to the Showground from the Friendly Farmer link with a new left turn with an auxiliary lane.</p> <p>A sketch of the statutory consultation design is contained below.</p> 	<p>In line with the Design Manual for Roads and Bridges, auxiliary lanes should not be provided on single lanes, this has therefore been removed and replaced with a fully compliant left turn. Vehicle tracking has been used to confirm that this can be used by large heavy good vehicles.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Population and Human Health: the revised layout of the auxiliary lane increased the safety for users of the access to the showground from the Friendly Farmer link. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits increased.</p>
Winthorpe Roundabout		
<p>The Winthorpe Roundabout showed the mainline passing through the middle of Winthorpe Roundabout in a 'throughabout' layout.</p> <p>A sketch of the statutory consultation design is contained below.</p>	<p>The previous layout provided the required capacity at opening +15 years, but the forecast capacity usage of the link road connection at Friendly Farmer into Winthorpe is at 100%, above the 91% target for all arms of the junction. In addition, the Interim Road Safety Audit raised concerns that the A46 mainline traffic may not easily recognise the junction and vehicles may brake late or pass through red signals.</p> <p>By routing the northbound Friendly Famer Link Road traffic through the roundabout instead of the A46 mainline, it has optimised the flows through the roundabout, achieving all connections into the roundabout being below the 91% capacity at opening +15 years. In this layout the A46 through traffic has been directed around the roundabout and the Friendly Farmer link traffic passes through the roundabout, removing the risks identified in the road safety audit. This allows the cycle time of the 3 signal phases around the junction to be reduced from 90 seconds to 60 seconds which increases the green time available to all routes, and has subsequently improved flows further through the junction.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Water quality: a reduced footprint which is likely to result in less surface water runoff and the associated adverse effects.Flood risk and drainage: a potential reduction in hardstanding impermeable surface and associated drainage requirements.Biodiversity: the revised design has reduced the loss of semi-mature and mature trees present within the roundabout and to the south of the A46, likely to be of use to nesting birds and commuting bats.Noise: potential for a slight reduction in noise in the vicinity of the junction resulting from smaller roundabout, although there are no properties or noise-sensitive receptors in the immediate location.

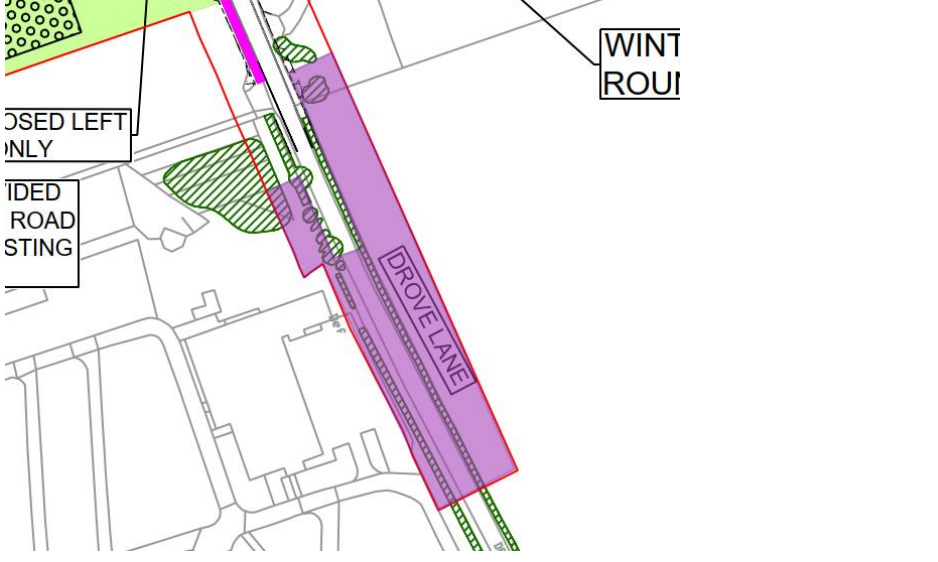

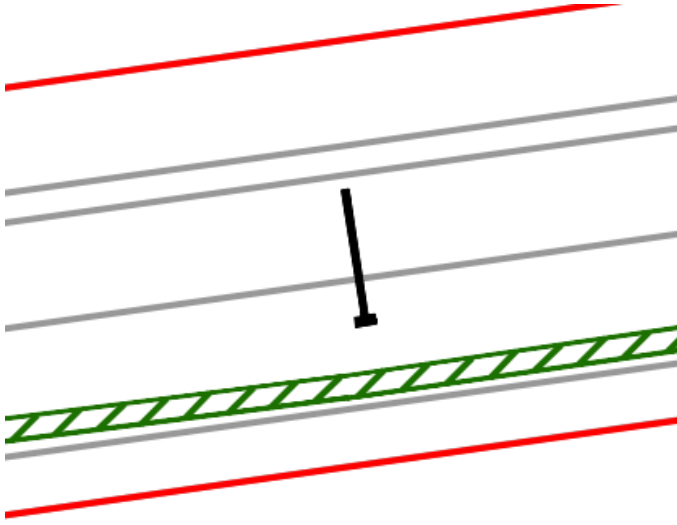
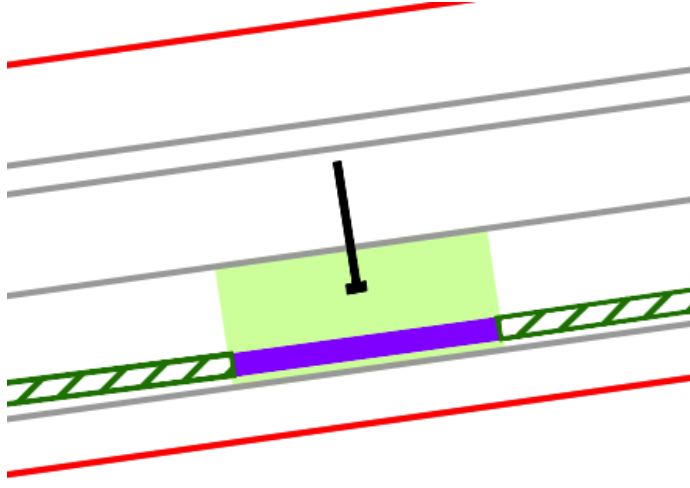
Statutory Consultation Design	Revised design	Summary of environmental effects
	<p>A further advantage is that the footprint has reduced significantly to the east of the junction as the long E/B type B merge with auxiliary lane is not required. The new layout also provides the opportunity to provide a signalised walking and cycling route across the junction crossing the A46 between Drove Lane and the A1133 which was not possible on the previous layout without affecting traffic flows.</p> 	<ul style="list-style-type: none"> Population and human health: improvements to non-motorised user routes due to reduced cycle time. Landscape: Improved retention of existing vegetation. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Land south of the A46 east of Winthorpe Roundabout		
<p>The additional land was shown for potential essential mitigation planting.</p> 	<p>Following completion of the environmental assessments, it has been confirmed that this land is no longer required to provide essential mitigation as, following completion of the full environmental impact assessment, it has been determined that sufficient mitigation can be achieved within the revised Order Limits. The unused land has been removed from the order limits to the south of the A46 east of Winthorpe Roundabout up to the boundary of the track that will be used for constructing the Variable Message Sign on the A46.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <p>No benefits identified.</p> <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Access to Newark Showground from Drove Lane		
<p>In the previous design, a new access was provided from Drove Lane to the south of Winthorpe Roundabout.</p> <p>A sketch of the statutory consultation design is contained below.</p>	<p>The existing access/egress will be changed to an exit only and vehicles will have to turn left onto Drove Lane. This has been done to reduce the risk of traffic wishing to enter the show ground queuing back onto the roundabout.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <p>No benefits identified.</p> <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>



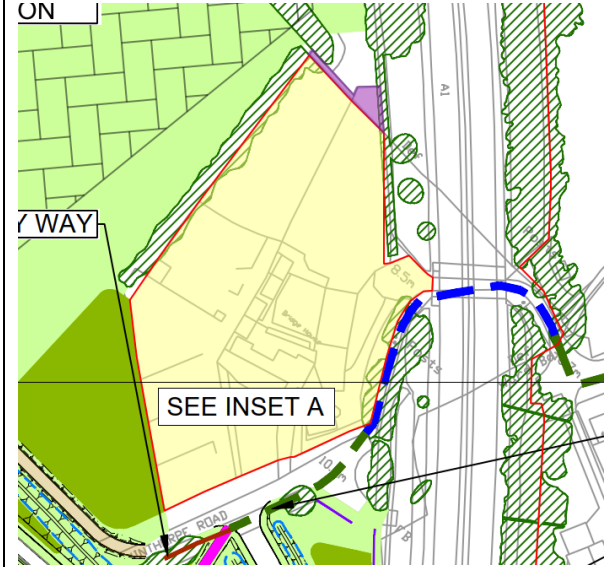
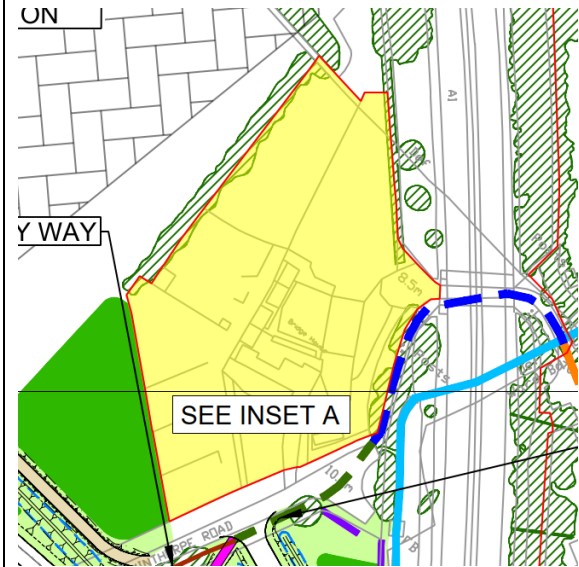
Statutory Consultation Design	Revised design	Summary of environmental effects
		
Access to Langford Hall		
<p>The northbound on-slip to the new Winthorpe roundabout requires the existing access road to Langford Hall to be stopped up. A corridor was included for a replacement access from the A1133, however through consultation with the landowner it was identified that this would not be an appropriate alignment as it would require a significant loss of vegetation.</p> <p>A sketch of the statutory consultation design is contained below.</p> 	<p>The new location provides a direct link to the existing access track to the front of the hall and unused land has been removed near the Langford Hall access track.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Biodiversity: area of wood pasture priority habitat is avoided completely, which is described as irreplaceable habitat. Arboriculture: The majority of trees in the immediate surrounding area are young to semi-mature. Young trees removed to facilitate works would be easily replaceable. Potential mature trees would be retainable with a considered approach to construction in line with an Arboricultural Method Statement (details of which are contained within Appendix 7.4 of the Arboricultural Impact Assessment, [APP-140]). <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Archaeology: Below ground archaeological remains have been identified along this route. The geophysical survey revealed potential pre-historic ring ditches and linear features. Construction of this route could result in the removal/truncation of below ground archaeological remains and therefore further archaeological excavation would be required and an archaeological watching brief may be required during construction of route. Heritage: the option would introduce a strong visual bisection in the historic landscape and built heritage (which also considers landscape character and visual effects) which contributes to the wider setting of the hall (consisting of two Grade II and one Grade II* Listed Buildings). Although the full length of historic driveway would be retained, it would dilute the relationship and connectivity between the hall and lodge, as visitors to the hall would no longer have to drive past the lodge -

Statutory Consultation Design	Revised design	Summary of environmental effects
		thereby removing the understanding of their historic relationship.
Slough Dyke		
<p>It was assumed that Slough Dyke (classified as a Water Framework Directive (WFD) main river by the Environment Agency) could be retained in its current location when the layout was developed.</p> 	<p>Further discussions have taken place with the Environment Agency and the Applicant's maintenance team and the constraints identified require it to be diverted approximately 6.0m to the east. The following changes have been made:</p> <ul style="list-style-type: none"> The channel profile (cross-sectional dimensions, and nature of riparian habitat) would be reinstated to match existing. The bridge span has been increased to 62m and the wing walls of the structure over the A1 have been realigned. The access track has been extended beneath the structure to help prevent scour of the bridge foundations. The existing vegetation has been removed adjacent to the A1 slip road and been replaced with a new native hedgerow with trees that is 5 metres offset from the top of the bank. This is to provide a 4m wide grass access track so that the Environment Agency can access Slough Dyke for routine maintenance and monitoring. The size of the attenuation area has been slightly reduced accordingly to accommodate the grass access track. 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Water environment: The Slough Dyke (The Fleet) would be realigned with similar cross-sectional dimensions and riparian habitat as currently in place with the addition of buried scour protection. Therefore, it is not anticipated that there would be a change in flow dynamics/riparian habitat or biodiversity conditions. However, the permanent realignment of the watercourse would result in a minor increase in length and sinuosity of the watercourse creating a more natural channel. This has the potential to result in a slight beneficial effect for the waterbody hydromorphology because it is currently classified as 'heavily modified' in WFD status, and the Scheme would result in a more natural channel than currently present. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Langford Hall bunds and access track		
<p>The detail below showed an existing track from the A1133 being used to relocate the existing Access for Langford Hall which is currently directly from the A46 to the north of Winthorpe Roundabout.</p>	<p>Stakeholder engagement identified that track shown at public consultation would not be suitable for alternative access to Langford Hall. A new track was therefore provided from further south on the A1133 as shown. Additionally two landscape bunds with planting will be provided to either side of the track to screen the roundabout from Langford Hall.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Landscape: Allows increased screening opportunities for Langford Hall looking towards the A1133 and A46. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>

Statutory Consultation Design	Revised design	Summary of environmental effects
		
<p data-bbox="210 779 1110 842">Southern Link Road</p> <p data-bbox="210 842 1110 1031">The Order Limits at consultation included the location where the southern link road ties in with the A46 south of Farndon Roundabout. At this time, the final design for this connection had not been concluded, so this area was included in the Order Limits in case any additional works would be needed to improve this as part of the Scheme.</p> 	<p data-bbox="1110 779 2012 1136">The area of land within the Order Limits allocated for potential future modifications to the Newark SLR roundabout has been removed. This is because the Applicant confirmed that any future changes to that roundabout would be outside the scope of the A46 Newark Bypass Scheme and would be covered by the Operations Directorate or Newark and Sherwood District Council as part of their terms of delivery relating to the Southern Link Road project.</p> 	<p data-bbox="2012 779 2775 842">The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <p data-bbox="2012 842 2775 905">No benefits identified.</p> <p data-bbox="2012 905 2775 968">The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p data-bbox="2012 968 2775 1031">No disbenefits identified.</p>
<p data-bbox="210 1591 2775 1654">Land near Nottingham to Lincoln Railway Line West Crossing</p>		
<p data-bbox="210 1654 1110 1738">The land shown was to provide the anticipated requirement for construction access.</p>	<p data-bbox="1110 1654 2012 1986">The access requirements have been refined and the land required has been reduced. A 5m offset has been provided from the back of the hedge to allow for construction machinery access, realigning cut off ditches and accounting for any future level changes (within the limits of deviation). The Order Limits have also been brought in to the boundary of the temporary work areas and grassland areas, and been reduced over the railway line to reduce interaction with Network Rail land.</p>	<p data-bbox="2012 1654 2775 1717">The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul data-bbox="2012 1717 2775 1864" style="list-style-type: none">• Reduced landtake and so a reduction in temporary disturbance to environmental receptors. <p data-bbox="2012 1864 2775 1986">The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p>

Statutory Consultation Design	Revised design	Summary of environmental effects
 <p>EXISTING A46 CARRIAGEWAY WIDENED TO THE NORTH</p>	 <p>EXISTING A46 CARRIAGEWAY WIDENED TO THE NORTH</p>	<p>No disbenefits identified.</p>
Land near Nottingham to Lincoln Railway Line East Crossing		
<p>As part of the design development, it was determined that the Order Limits could be reduced in this area.</p>  <p>NOTTINGHAM TO LINCOLN RAILWAY LINE EAST CROSSING</p>	<p>The unused land has been removed from the Order Limits near the Nottingham to Lincoln Railway Line East Crossing and the Order Limits reduced over the railway line to reduce interaction with Network Rail land.</p>  <p>NOTTINGHAM TO LINCOLN RAILWAY LINE EAST CROSSING</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> A smaller area of permanent land take is required, resulting in a reduction in vegetation loss and subsequent reduction in adverse impacts upon biodiversity, landscape character and visual amenity. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Drove Lane		
<p>Discussions were ongoing with the local authority to confirm the requirements in this area.</p>	<p>The unused land has been removed from the Order Limits adjacent to Drove Lane and the highways design trimmed to fully tie in before the bowling club access.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> A smaller area of permanent land take is required, resulting in a reduction in vegetation loss and subsequent reduction in adverse impacts upon biodiversity, landscape character and visual amenity. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>

Statutory Consultation Design	Revised design	Summary of environmental effects
		
Removal of hedge for construction of sign gantry		
<p>It was assumed that the gantry would be constructed from the existing A46 roadside.</p> 	<p>A 25m length of existing hedgerow is to be removed to the south of the A46 to the east of Winthorpe Roundabout so that the Variable Message Sign gantry can be constructed without disrupting traffic on the A46 and to improve safety for construction operatives and adjacent road users. The hedge will be reinstated once construction is completed. A grassed maintenance layby will be built next to the new gantry.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> No benefits identified. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Temporary loss of hedgerow resulting in potential adverse impacts to landscape and biodiversity receptors.
Land between the A46 and the A617		
<p>As part of the design development, it was determined that the Order Limits could be reduced in this area.</p>	<p>The land has been removed from the Order Limits between the A46 and A617, with the Order Limits also amended to better align with field boundaries.</p>	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> No benefits identified. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p>

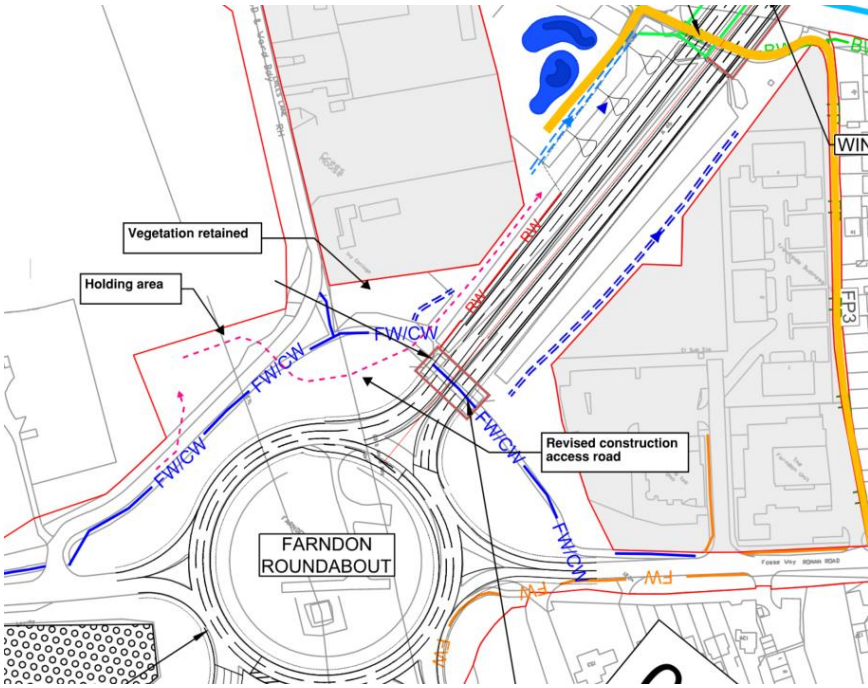
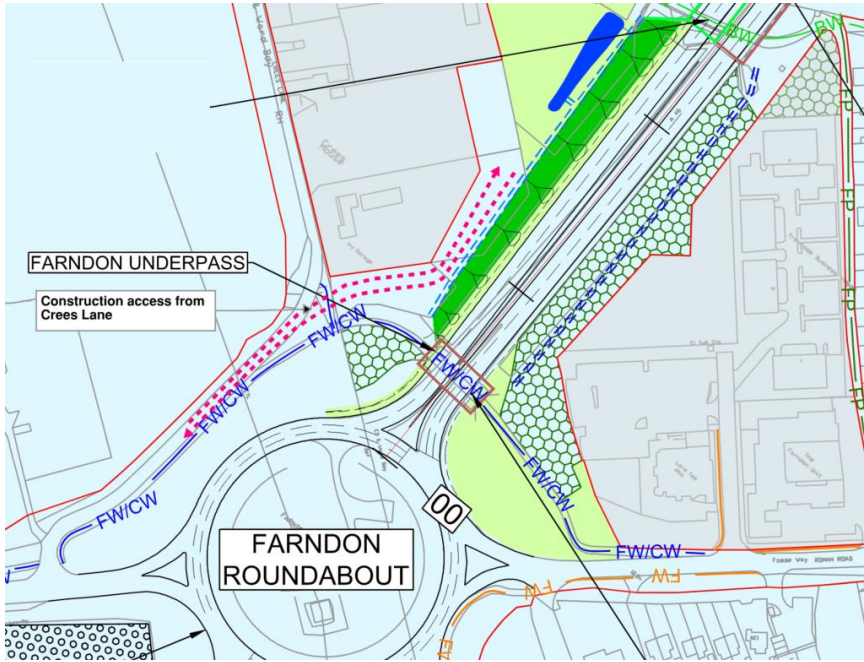
Statutory Consultation Design	Revised design	Summary of environmental effects
		No disbenefits identified.
Bridge House Farm		
<p>As part of the design development, it was determined that the Order Limits could be reduced in this area.</p> 	<p>The order limits have been amended at Bridge House Farm to better follow their land boundary following the land owners response to the statutory consultation.</p> 	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• No benefits identified. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>

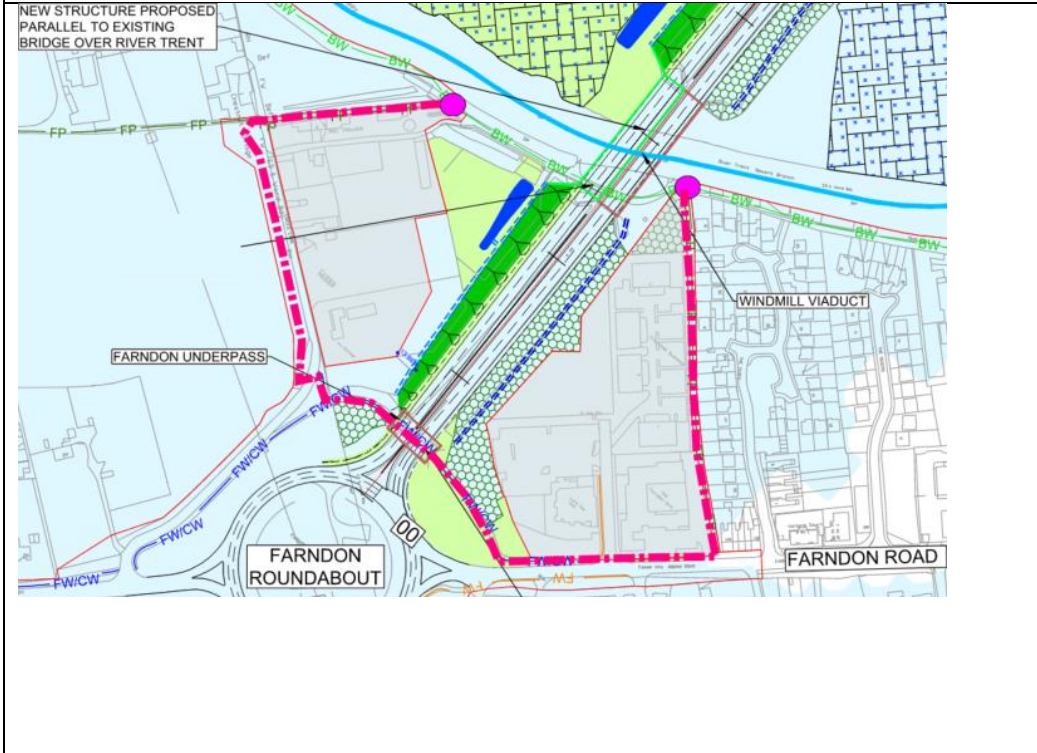
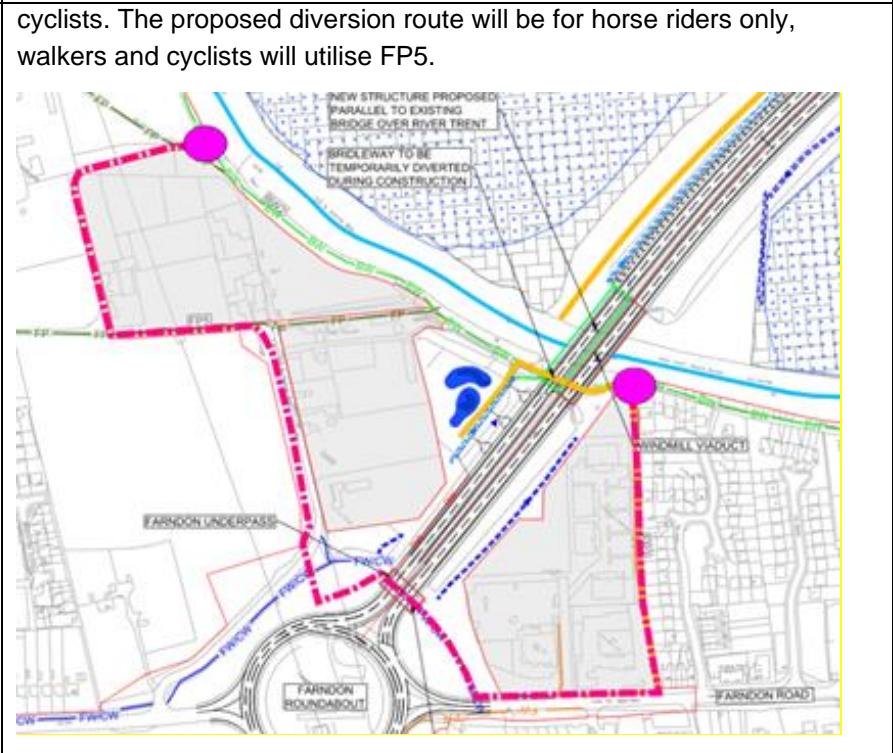
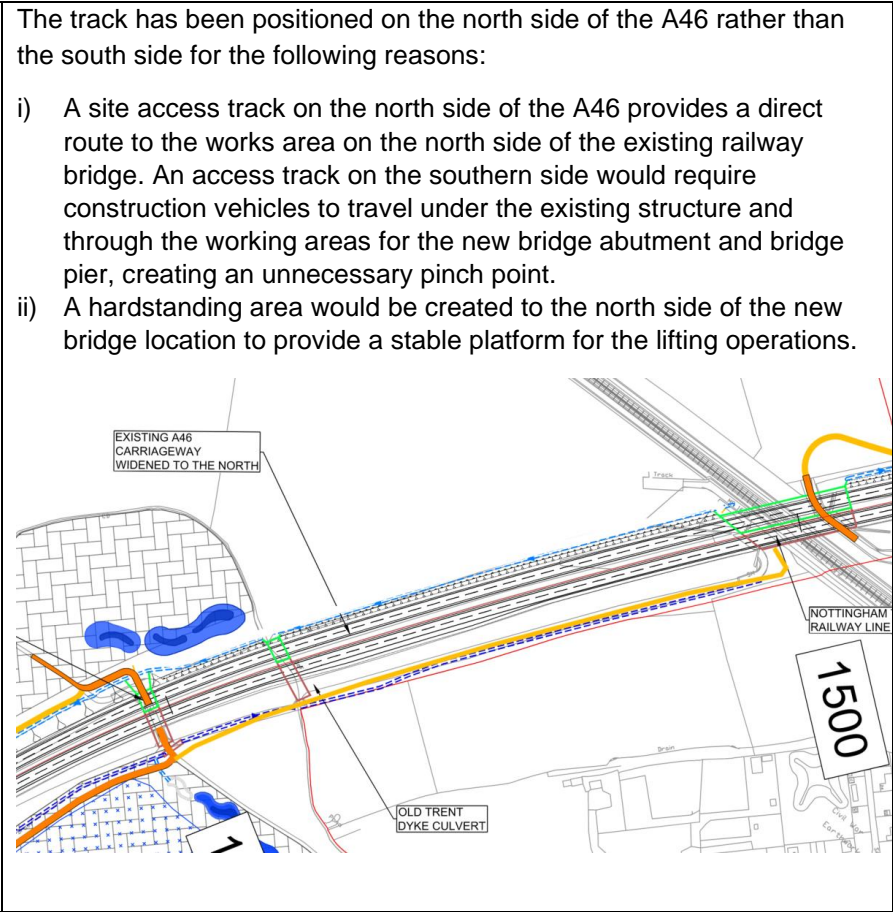
Development of temporary construction works

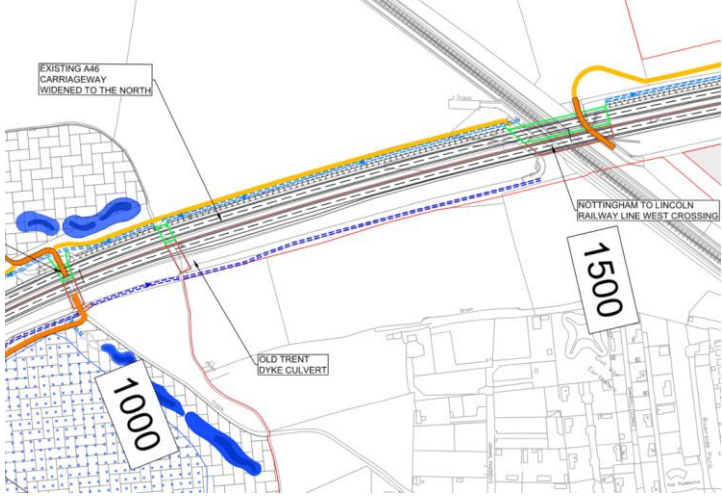
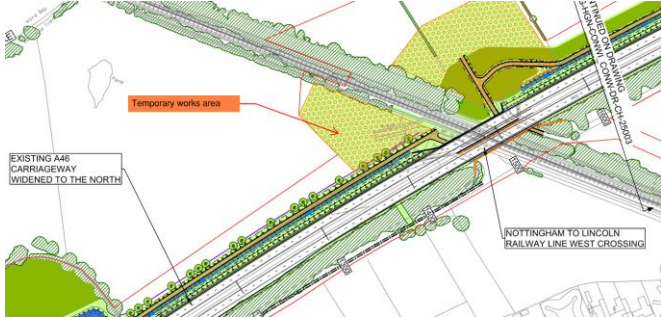
- 3.3.107 This section summarises the development of temporary construction works. These design developments have been integrated into the current Scheme presented and therefore the design that has been assessed within this ES.
- 3.3.108 The development of temporary construction works that have taken place for the design submitted at the point of the development consent application are detailed in Table 3-12 below.



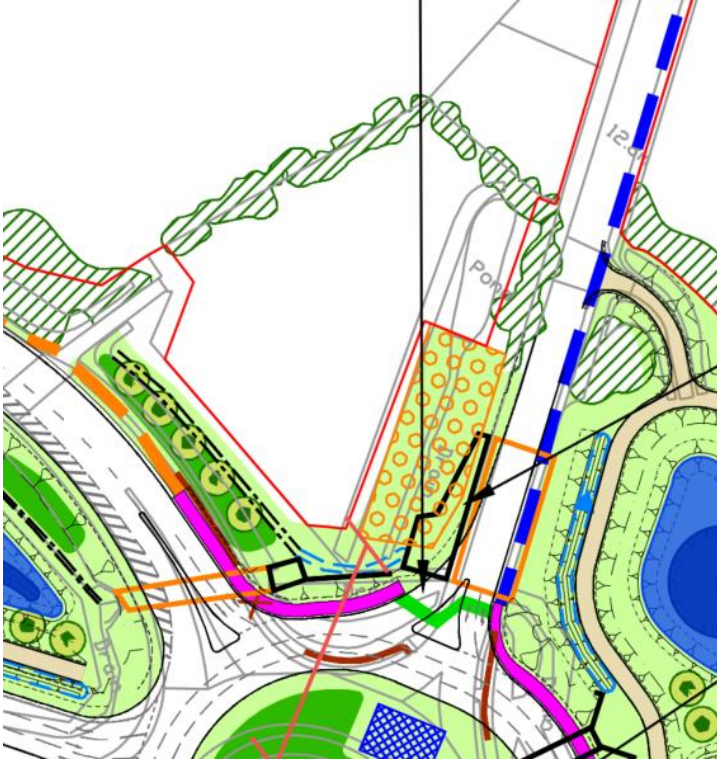
Table 3-12: Development of temporary construction works

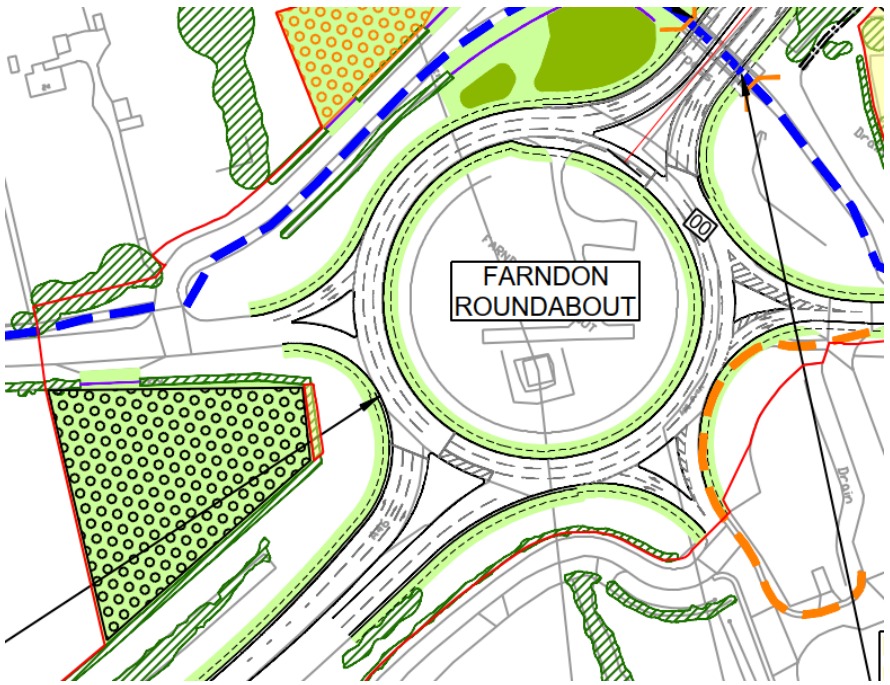
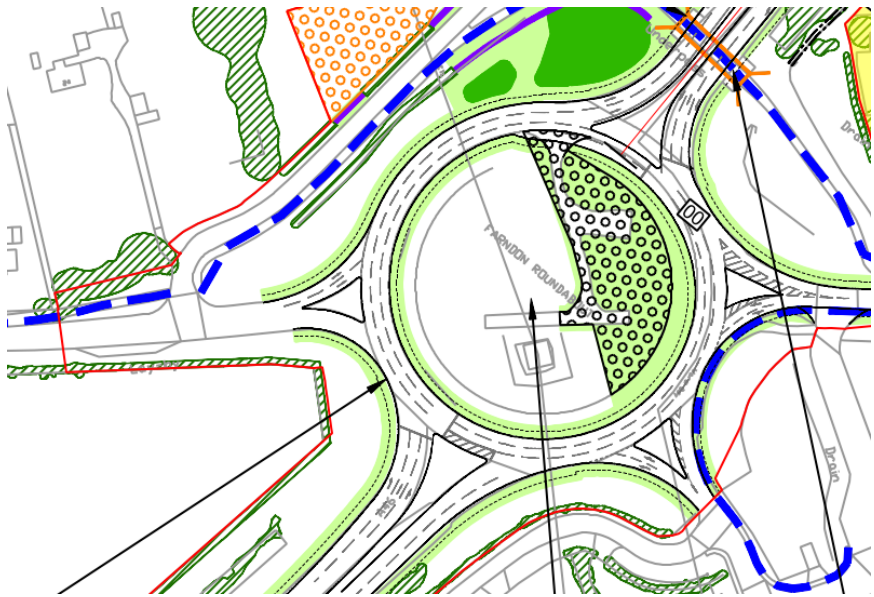
Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
Construction access at Crees Lane			
<p>The Order Limits for the statutory consultation design between the A46 and Ivy Cottage provided the working area for a temporary construction access road for construction vehicles entering and exiting Cress Lane to facilitate the construction of the southern abutment of the new Windmill Viaduct and widening works to the new embankment.</p> <p>The temporary access road would have required the existing vegetation between the A46 and Ivy Cottage to be removed, including parts of the gardens belonging to the residential properties within the vicinity being within the temporary works area.</p>	<p>The design was revised to both reduce the impact to the residents' gardens and retain more of the existing vegetation.</p> <p>The Order Limits were realigned to the south, retaining the existing vegetation at the southwest corner between Ivy Cottage and Crees Lane. The widening to the A46 to create the new northbound carriageway would now be achieved with the introduction of a sheet pile retaining wall.</p> <p>The construction access road would now be installed between the retaining wall and the Order limit boundary, which is a reduction of the original width.</p> <p>To safely manage the logistic movements of construction vehicles in and out of the work area, and to mitigate the threat of construction traffic queuing on Crees Lane, a section of land was identified in the field north of Crees lane to act as a temporary holding area for construction vehicles.</p>	2 years	<p>The revised construction strategy has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Landscape: vegetation that screened the residential properties from the road has been retained.• Biodiversity: retention of vegetation that has the potential to provide habitats has been retained as a result of the revised design.
Temporary bridleway BW2 diversion			
<p>The construction of the new Windmill Viaduct requires Newark Bridleway 2 (BW2) to be temporarily diverted.</p> <p>In the statutory consultation design the BW2 was diverted along Farndon footpath path 5 (FP5) between the River Trent and Crees Lane.</p>	<p>The temporary diversion was realigned to utilise an existing stone access road located to the north of FP5. This was selected as it provides a wider route for active travel users. FP5 is particularly narrow at the proposed diversion (approximately 1.5 metres) and would have created a safety issue for users when horses passed walkers and</p>	2 years	<p>The revised construction strategy has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">• Population and Human Health: the revised design

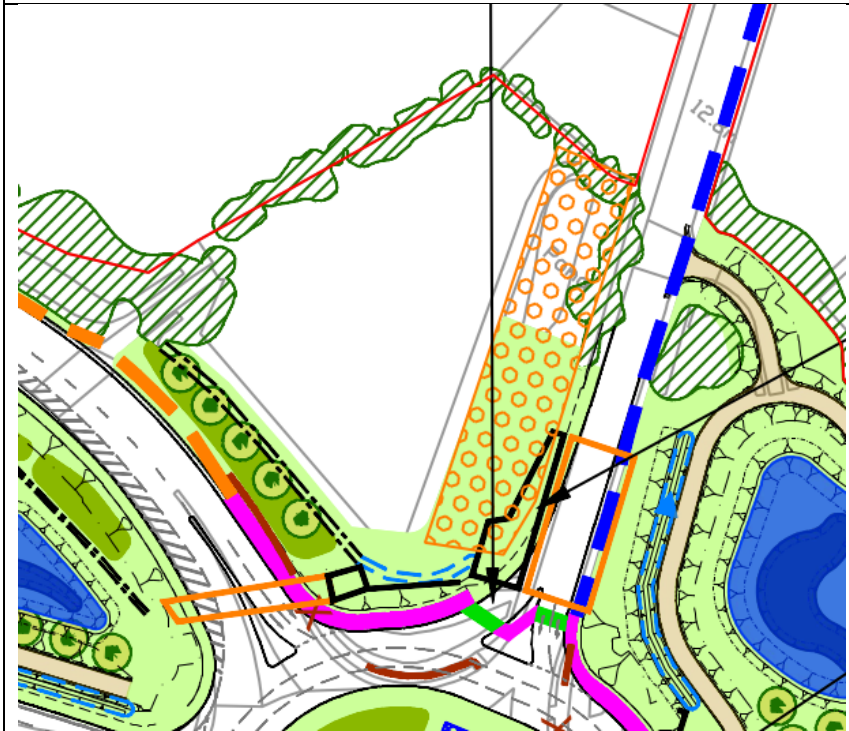
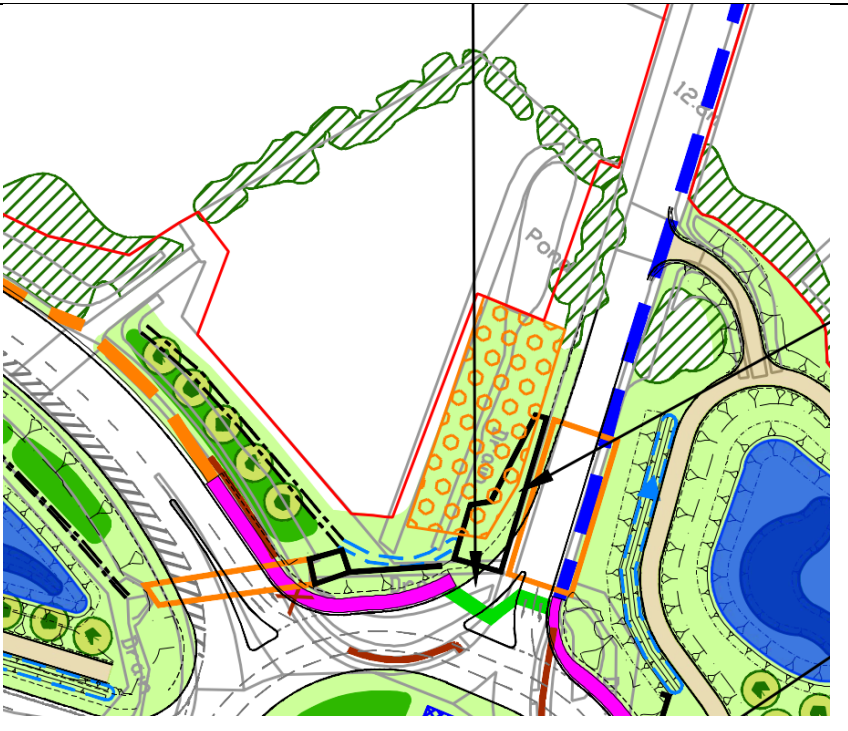


Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
	<p>cyclists. The proposed diversion route will be for horse riders only, walkers and cyclists will utilise FP5.</p> 		<p>maintains the accessibility for active travel users by providing a wider temporary bridleway.</p>
Section 1 haul road (Farm underpass to Nottingham to Lincoln railway line)			
<p>The construction of the embankment widening between the Farm Access underpass and the south abutment of the Nottingham to Lincoln Line (West) crossing require a temporary site access road to be constructed to allow plant and equipment to access the work area.</p> <p>Access to these work areas would be via a modified site access and exit, utilising the existing field access bell mouth off the A46 southbound carriageway which is located approximately 200 meters north of the Windmill Viaduct.</p> <p>The existing field access track will be modified to create a site access road up to the Farm Access underpass, this would be converted into a permanent field and maintenance access track on completion of the construction works.</p> <p>The site access track passes under the existing underpass where it then splits to the west (to provide access to the north abutment of Windmill Viaduct) and to the east (to provide access to the south abutment of the railway bridge).</p>	<p>The track has been positioned on the north side of the A46 rather than the south side for the following reasons:</p> <ol style="list-style-type: none">A site access track on the north side of the A46 provides a direct route to the works area on the north side of the existing railway bridge. An access track on the southern side would require construction vehicles to travel under the existing structure and through the working areas for the new bridge abutment and bridge pier, creating an unnecessary pinch point.A hardstanding area would be created to the north side of the new bridge location to provide a stable platform for the lifting operations. 	<p>The haul road will be used for a period of 2 to 2.5 years during construction and will then be converted to the permanent maintenance access track.</p>	<p>The revised construction strategy has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Population and human health: A track located on the southern side of the A46 would require the existing highway boundary to be moved further south, towards residential properties off Tolney Lane, moving construction traffic closure to these receptors.Noise: a slight movement of vehicle noise and vibration further away from Tolney Lane.Air quality: a slight movement of vehicle emissions further away from Tolney Lane.Biodiversity: A track located on the southern side of the A46 would have required clearance of the existing vegetation on the south

Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
<div></div> <p>A temporary works area is proposed within the grazing marsh to the south of the Nottingham to Lincoln railway line. This would be used as a material laydown area, construction working area and contain welfare facilities for the construction of the southern abutment and supporting pier for the new Nottingham to Lincoln railway crossing.</p> <div></div> <p>This location has been selected over the other alternative, the field to the southeast of the bridge, for the following reasons:</p> <ul style="list-style-type: none">• The temporary works would be closure to the properties along Tolney Lane increasing impact from noise.• The haul road from the A46 to the Nottingham to Lincoln railway bridge would need to be extended to the temporary works area, under the existing bridge and through the construction area for the new southern abutment and bridge pier. This creates a narrow access corridor that impedes the construction of the bridge. This could be mitigated by bringing deliveries along Tolney Lane, however this would increase disruption for the residents and require further construction traffic to use the Great North Road.• A working area would still be required on the north side of the railway bridge as this is the location that the crane would be located for lifting operations.			<p>embankment. Therefore, loss of existing vegetation has been avoided.</p>

Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
			
Great North Road/Kelham Road construction access			
<p>There are several elements of work between the A617 Kelham Road and the A616 Great North Road that require a construction access to be created. These include:</p> <ul style="list-style-type: none">Construction access required from the existing field access track (with modifications) to enable construction of the culvert extension, embankment widening and extending the western side of the Smeatons Arches.Pedestrian access is possible through the existing arches but requires individuals to duck. The headroom and width is not suitable for the plant required to undertake the bridge extension works which would need to access from the western side.Temporary ramp constructed at northern end of field to create an exit on to the Great North Road for construction traffic. 	<p>The extent of the embankment widening and widening works to the Smeaton's Arches has reduced meaning that the construction access can be realigned closer to the existing road.</p> <p>The existing vegetation on the west side of the access bell mouth will be retained.</p> <p>The construction exit onto Great North Road has been removed.</p> 	18 months to 2 years	<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none">Biodiversity: A track located on the northern side of the A46 would still require clearance of a priority habitat but for a much smaller area than was originally required as part of the statutory consultation design. Mitigation includes the translocation of this priority habitat.

Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
Farndon site compound			
<p>The compound was shown between Farndon Road and the A46 to the west of the existing Farndon Roundabout and would have been accessed off Farndon Road.</p> 	<p>The location of the site compound near Farndon has been moved to the centre of Farndon Roundabout. This is because archaeology at the site previously proposed would have prohibited it from being used as a site compound, as was highlighted by the county archaeologist in their response to the statutory consultation. The access to the site compound will be via the existing access on the north side of the roundabout circulatory. The Order Limits in this location have also been reduced to remove that field.</p> 		<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Archaeology: Below ground archaeological remains have been identified at the compound's previous location. The new proposed location now results in a minimal impact on receptors. Therefore, there are no heritage impacts in the new location. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>
Smeaton's Arches temporary works area			
<p>The land required had been reduced since statutory consultation in order to minimise the works within the priority habitat and to suit the reduced footprint of the A617 approach to Cattle Market Roundabout.</p>	<p>The location of the temporary works area near Smeaton's Arches has been reduced in size so that it does not clash with an existing pond in that location. The red line boundary in this location has also been reduced in this location to remove the adjacent field from the order limits as this is a priority habitat area. In addition, a small amount of additional existing vegetation is also being removed to allow construction access to the temporary works area.</p>		<p>The revised design has the potential to result in the following environmental benefits compared to the statutory consultation design:</p> <ul style="list-style-type: none"> Biodiversity: Majority of existing priority habitat, associated vegetation and pond retained. <p>The revised design has the potential to result in the following environmental disbenefits compared to the statutory consultation design:</p> <p>No disbenefits identified.</p>

Previous construction strategy	Revised construction strategy	Duration required	Summary of environmental effects
			

3.4 Justification for chosen scheme design

- 3.4.1 In summary, a total of five possible corridors were identified during the Strategy, Shaping and Prioritisation and Option Identification. The potential corridors undertook a sifting process using the EAST+. These options were initially sifted for their best fit against specific strategic, economic, managerial, financial and commercial criteria. A high level environmental assessment was undertaken to inform the EAST sifting criteria. Corridor C was identified as the recommended corridor route to take forward.
- 3.4.2 Potential routes and junctions were developed within the Corridor. Three potential routes were identified at first, with an additional route identified further on in the assessment within the preferred route corridor to ensure a wide range of possibilities were considered. The four potential options underwent a Route and Option Sifting process which consisted of an Affordability Assessment, Local Traffic Appraisal, Enhanced Traffic Appraisal, Cost and Early Benefit Appraisal and Traffic and Environmental Assessment. The 4 options were reduced down to 2 options. The two options were taken forward to Options consultation. The environmental effects of Scheme options were assessed in accordance with DMRB, and this information helped to inform the decision on which of the two options should be taken forward.
- 3.4.3 These two options were taken forward to Options consultation which was held in December 2020 to February 2021. Feedback was provided on the options and consequent modifications were made.
- 3.4.4 As a result of the assessment and outcomes of the Options consultation, the preferred option was announced in February 2022. Option 2 Modified was chosen over option 1 primarily because it minimised land take. In turn, the option was less likely to have significant adverse effects on landscape, townscape and visual receptors, water, mineral resources, waste generation, and materials asset use. Also, it was less likely to have significant adverse environmental effects due to less habitat fragmentation, had fewer impacts on heritage assets and a smaller impact on affected listed structures along the A616, and had the least likely significant adverse effects predicted for noise.
- 3.4.5 Following the presentation of Option 2 Modified at Statutory Consultation in October to December 2022, the Scheme design evolved as a result of the feedback received and through discussions with consultees as part of the Technical Working Groups with statutory and other environmental bodies and the Statutory Consultation feedback. Following the statutory consultation, National Highways carried out a non-statutory targeted consultation between March and April 2023 on updates made to six areas of the Scheme. Amendments were made to the locations, scale and size of Scheme

aspects, such as junctions and floodplain compensation areas, which resulted in an overall reduction on the number of adverse effects associated with factors such as landscape, cultural heritage, biodiversity, noise and air quality.

- 3.4.6 The result of this assessment demonstrated the rationale and decisions made for the final preliminary design to be submitted as part of the development consent application which has been assessed within this ES.

3.5 References

¹ Statutory Instrument (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, No. 527.

² Department for Transport (2014) National Policy Statement for National Networks [online] available at: <https://www.gov.uk/government/publications/national-policy-statement-for-national-networks> (last accessed December 2023).

³ Department for Transport (2023) Draft Revised National Networks National Policy Statement [online] available at: [Draft revised national networks national policy statement - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/draft-revised-national-networks-national-policy-statement) (last accessed December 2023).

⁴ Department for Transport (2011) Early Assessment Sifting Tool (EAST) Guidance document [online] available at: [Early Assessment and Sifting Tool \(EAST\) Guidance.pdf \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/publications/early-assessment-sifting-tool-east-guidance) (last accessed December 2023).

⁵ National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](https://www.citizenspace.com/pw-integrated-template) (last accessed December 2023).

⁶ “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 Nov 2022 Accessible v1.0 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal-nov-2022-accessible-v1-0) (last accessed December 2023).

⁷ “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 Nov 2022 Accessible v1.0 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal-nov-2022-accessible-v1-0) (last accessed December 2023).

⁸ National Highways (2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](https://www.citizenspace.com/pw-integrated-template) (last accessed December 2023).

⁹ Design Manual for Roads and Bridges (2020) LA 104 – Environmental assessment and monitoring [online] available at: [0f6e0b6a-d08e-4673-8691-cab564d4a60a \(standardsforhighways.co.uk\)](https://standardsforhighways.co.uk/0f6e0b6a-d08e-4673-8691-cab564d4a60a) (last accessed December 2023).

¹⁰ Design Manual for Roads and Bridges (2020) LA 103 – Scoping projects for environmental assessment [online] available: [fb43a062-65ad-48d3-8c06-374cfd3b8c23 \(standardsforhighways.co.uk\)](https://standardsforhighways.co.uk/fb43a062-65ad-48d3-8c06-374cfd3b8c23) (last accessed December 2023).

¹² National Highways (November 2020) A46 Newark Bypass Options Summary Report [online] available at: [PW Integrated Template \(citizenspace.com\)](https://citizenspace.com/PW-Integrated-Template) (last accessed December 2023).

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