Suffolk County Council

IPSWICH NORTHERN ROUTES

Appendix G – Environmental Impacts Note

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CONSENT ROUTE MEMO

1 INTRODUCTION

1.1.1. WSP has been commissioned by Suffolk County Council (SCC) to carry out an environmental appraisal for the three proposed Highway Route options (Inner route, Middle route and Outer route) for the Ipswich Northern Route (INR) scheme – a proposed new road linking the A14 and the A12 to the north of Ipswich.

1.1.2. The environmental appraisal is intended to support the Strategic Outline Business Case (SOBC) and has drawn on the methodology and criteria set out in the WebTAG unit A3 'Environmental Impact Appraisal' and Volume 11 of the Design Manual for Roads and Bridges (DMRB)[1]. It has also drawn on WSP professional judgement based on its experience for similar highway projects.

[1] Highways England (2008) Design Manual for Roads and Bridges Volume 11 Section 2 Parts 5 and 6 – Assessment and Management of Environmental Effects. Available online at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section2.htm. [Accessed 25/03/2019].

2 APPROACH FOR THE ENVIRONMENTAL APPRAISAL

2.1.1. The environmental appraisal conducted for the SOBC is based on the second iteration of the design which is shown in **Figure 1** in **Appendix A**[2]. The environmental appraisal has been conducted on three corridors (or referred herein as 'Highway Route options') (see SOBC for further details):

- Outer Route (Option 1A – south of Coddenham);
- Middle Route (which includes two tie-ins to the A12, namely Option 2B and Option 2C);
- Inner Route (Option 2D).

2.1.2. The environmental qualitative appraisal supports the development of the SOBC to seek funding for a further stage of the INR Project. The following sub-impact areas were appraised qualitatively for the environmental topics defined in the WebTAG unit A3 guidance. These are:

- Air Quality;
- Greenhouse gases;
- Noise;
- Historic Environment;
- Landscape;
- Biodiversity; and
- Water Environment.

2.1.3. The Townscape topic was scoped out from further appraisal as the landscape character of the Study Area is primarily rural (shown in Figure 1-6 in Section 2.8 of the SOBC). However, the potential impacts on settlements/towns located within close proximity to the Highway Route options have been considered in the Landscape topic.

2.1.4. A buffer from the centreline of each Highway Route option has been defined for each environmental topic to undertake the environmental appraisal.

2.1.5. The qualitative appraisal is preliminary and will not provide a monetised assessment to support the derivation of the BCR. This desk-based exercise used readily available data and did not involve the completion of surveys, site visits or modelling. SCC would undertake a more rigorous assessment of environmental impacts and provide a monetised benefits/impacts at Outline Business Case (OBC)stage.

2.1.6. WebTAG worksheets for each topic have been completed (see **Appendix B**) to provide evidence for the overall score incorporated into the Appraisal Summary Table, which support the determination of the BCR for each option as detailed further in Section 2.8 of the SOBC.

[2] Figure 1 do not show variants for the Highway Route options shown on the consultation map (i.e. Outer Route north of Coddenham; western junction tie into the A14 for the Middle Route and the Inner Route; and eastern junction tie into the A12 for the Inner Route, north of Junction A12/A1214). These have not been assessed in the environmental appraisal but may be considered further at the OBC-stage. These were identified for consultation to reflect options being explored by the design team for the tie-in of the route options to the A12 and the A14. These considered environmental and engineering constraints.

2.1.7. The sections below present a summary of the findings of the WebTAG appraisal of the three Highway Route options for each environmental topic. A summary of the key findings of each topic is also provided with key recommendations for the OBC.

SUMMARY OF ENVIRONMENTAL IMPACTS

Table 2-1 - Environmental Impact Summary

Option	Noise*	Air Quality*	Greenhouse Gases*	Landscape	Historic Environment	Biodiversity	Water Environment
Outer Route	Slight Adverse	Slight Adverse	Neutral	Moderate Adverse	Large Adverse	Large adverse	Slight Adverse
Middle Route	Slight Adverse	Slight Adverse	Neutral	Moderate Adverse	Moderate Adverse	Large adverse	Moderate Adverse
Inner Route	Slight Adverse	Slight Adverse	Neutral	Moderate Adverse	Moderate Adverse	Large adverse	Moderate Adverse

** WebTAG does not give scores for these topics, these are estimates only, based on a 7 point scale in order to give some proportion to the appraisal.*

***The scoring guide used to conduct the environmental option appraisal is presented below:*

- *Beneficial (Slight, Moderate and Large): The proposed option is expected to have a positive impact. This can have a very small positive impact (Slight Beneficial), a medium positive impact (Moderate Beneficial) or a significant positive impact (Large Beneficial) on the environment.*
- *Neutral effects: The proposed option is not expected to have noticeable change on the environment.*
- *Slight Adverse (negative) effect: The proposed option is expected to have some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements of the environment. This may require additional standard mitigation measures.*
- *Moderate Adverse (negative) effect: The proposed option may lead to the loss of resource or partial loss of/damage to key characteristics, features or elements of the environment. This may require a change in design or the implementation of specific mitigation measures in addition to the implementation of standard mitigation measures.*
- *Large Adverse (negative) effect: This option may lead to the loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements of the environment. The proposed option is very likely to require a change in design or the implementation of specific mitigation measures in addition to the implementation of standard mitigation measures.*

3 ENVIRONMENTAL APPRAISAL

3.1 AIR QUALITY

3.1.1. There are no Air Quality Management Area (AQMA) located within the Highway Route options[3]. The nearest AQMA is located in Woodbridge. This AQMA could experience positive and negative effects.

3.1.2. No Defra Pollution Climate Mapping (PCM) links were identified within the Outer Route and the Middle Route. A Defra PCM link was identified as the A1214, Main Road, Kesgrave which leads to the junction with the A12 and the Inner Route. The expected NO_2 concentrations at this PCM link was 26.3µg/m^3 in 2017.

3.1.3. The potential sensitive receptors identified within 200m[4] from the Highway Route options are presented below. The location of these receptors is shown in **Appendix C**.

OUTER ROUTE

3.1.4. There are 147 sensitive receptors identified within 200m of the Outer Route and the junctions with the A12 (Woodbridge). These include residential buildings and two hotels.

3.1.5. One ecological receptor, Borley Wood, an Ancient Woodland, was identified within 200m of the Outer Route.

MIDDLE ROUTE

3.1.6. There are up to 234 sensitive receptors within 200m of the Middle Route, predominantly along the A14, at the Claydon junction and the A12 Woodbridge. Other areas include Witnesham. These include residential buildings, schools, two hotels and a care home. The high number of receptors is due to the proximity of residential buildings to the tie-in with the A12 Woodbridge.

3.1.7. One ecological receptor, Blunts Wood, an Ancient Woodland, was identified within 200m of the Middle Route.

INNER ROUTE

3.1.8. There are 76 sensitive receptors identified within 200m of the Inner Route, predominantly in the A14, Claydon junction, north of Kesgrave in Playford Road and the junction of the A12/ A1214 east of Kesgrave and west of Martlesham. These include residential buildings, schools, a hotel and a care home.

3.1.9. Two ecological receptors, Sinks Valley, Kesgrave, a Site of Special Scientific Interest (SSSI), and Lux Wood, an Ancient Woodland, were identified within 200m of the Inner Route.

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[3] AQMA interactive map (2018). DEFRA Website. Available at: https://uk-air.defra.gov.uk/aqma/maps#. Last accessed 11/04/2019.

[4] This study area follows the recommendation of the DMRB – Volume 11 Section 3 Part 1 - HA 207/07 – Air Quality. The 200m buffer is applied either side from the centreline of the Highway Route options.

OVERALL CONCLUSIONS

3.1.10. The proposed Highway Route options would change air quality at these locations. The Middle Route was identified as having the maximum number of the sensitive receptors likely to be affected in terms of local air quality.

3.1.11. Baseline conditions show that concentrations are likely to be below the annual mean NO_2 objective. The maximum NO_2 annual mean concentration, of 35µg/m^3, near the proposed Highway Route options was identified at Kesgrave.

3.1.12. The Highway Route options, excluding impacts in the wider road network, are likely to create negative and positive changes in terms of local air quality and unlikely to be significant. The Highway Route options are likely to have the greatest impacts in terms of local air quality along the junctions with the A12. This conclusion is based on the likely changes of traffic data within the Highway Route options, the number of sensitive receptors located in the vicinity of the proposed junctions along the A12 and the results from the closest East Suffolk Council (ESC) air quality monitoring stations to the A12.

3.1.13. Overall, the Highway Route options are likely to have Slight Adverse effects on air quality.

RECOMMENDATIONS FOR THE OBC (IF PROGRESSED)

3.1.14. Traffic data provided for this qualitative air quality assessment was provided in the correct format as specified in the DMRB guidance for the Highway Route options only. Therefore, it was not possible to determine if changes will meet the DMRB criteria for “Scoping” level study across the wider road network.

3.1.15. A quantitative assessment using dispersion modelling is recommended to understand the scale and magnitude of air quality impacts for the selected Highway Route options, as well as a quantitative WebTAG appraisal.

3.1.16. Air quality monitoring at roadside locations along the A14 in the proposed areas of the Highway Route options is not available from local authorities. Therefore, it is recommended that air quality monitoring is undertaken for a minimum of three months in these areas to understand the current situation in terms of local air quality.

3.2 GREENHOUSE GASES

3.2.1. The UK Government is committed to reduce their national emissions of a range of pollutants as these can travel considerable distances and affect air quality across international boundaries. The Climate Change Act became UK Law on the 26th November 2008. This legislation introduced a new, more ambitious and legally binding target for the UK to reduce greenhouse gas (GHG) emissions to 80% below base year by 2050, with legally binding five year GHG budgets. The independent Committee on Climate Change (CCC) was set up to advise the UK Government on the setting and meeting of UK carbon budgets as well as monitoring progress against them scope and level of UK carbon budgets.

3.2.2. SCC has declared a Climate Emergency in March 2019 and is aiming to be a carbon neutral authority by 2030. SCC's Cabinet has agreed a paper to get policy agreed so all Council departments are required to consider carbon reduction in all their projects[5].

3.2.3. The Highway Route options intersect two local authorities: Babergh & Mid Suffolk District Councils and East Suffolk District Council. The total Greenhouse Gas (GHG) emissions for these administrative areas in 2017 was 19,115ktCO_2 for all sectors. Emissions associated with transport as a whole was estimated to be 7,201ktCO_2 in 2017, with A roads accounting for 4,773ktCO_2, minor roads 2,266ktCO_2 and Diesel Railways / Transport Other 162ktCO_2. None were provided in the dataset for motorways[6].

3.2.4. One of the objectives of the project is to optimise the environmental benefits of the Proposed Project and support low carbon development. Traffic modelling was conducted for the proposed Highway Route options. The results are presented further in Section 2.8 of the SOBC.

3.2.5. The construction of the Highway Route options would increase and decrease the traffic flow at some location along the proposed Highway Route options and outside of the Study Area. As such, it is anticipated that GHG emissions would increase. In addition, it is anticipated that congestion would be reduced along existing routes, and overall journey lengths would be shorter. The reduction in stop-start traffic and queueing would have a beneficial impact on GHG emissions as vehicles are operating closer to optimum efficiency. Reducing journey lengths would have a further beneficial impact on GHG emissions as vehicles would be operating for a shorter period.

RECOMMENDATIONS FOR THE OBC (IF PROGRESSED)

3.2.6. At this stage a full carbon footprint assessment has not been done. Should the Project progress further at OBC-stage, a detailed GHG emission appraisal is recommended including the carbon impact of the project.

3.2.7. Overall, there is considered to be a Neutral impact on GHG emissions for all the Highway Route options given the potential increase and decrease in greenhouse gas emissions.

3.3 NOISE AND VIBRATION

3.3.1. The Highway Route options footprint do not fall within any Defra Noise Important Areas (NIAs), locations where the 1% of the population are affected by the highest noise levels from major roads according to the results of Defra's strategic noise maps[7]. However, the Highway Route options are adjacent to several NIAs located on the A12 and the A14, and these may have some indirect

[5] SCC (2019). Council Website. Council news. 'Working together to make Suffolk the greenest county in the land' Available at: https://www.suffolk.gov.uk/council-and-democracy/council-news/show/working-together-to-make-suffolk-the-greenest-county-in-the-land. Last accessed 29/08/2019

[6] Department for Business, Energy & Industrial Strategy (2019). UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2017. Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017. Last accessed 29/08/2019.

[7] Magic (2018). Magic Website. Available at: https://magic.defra.gov.uk/MagicMap.aspx. Last accessed 11/04/2019

impacts on these NIAs. The location of the NIAs and dwellings identified along the Highway Route options are shown in **Appendix D**.

3.3.2. The potential sensitive receptors identified within 600m[8] from the Highway Route options are presented below.

OUTER ROUTE

3.3.3. There are two NIAs located within 600m from the Outer Route option. These are NIA 11332 (located along the A140, west of Coddenham) and NIA 4810 (located along the A12, east of Woodbridge).

3.3.4. There are 1452 dwellings are located within 600m of the Outer Route. Most of noise sensitive receptors would be concentrated to the eastern edge of the route. These sensitive receptors and low density populated areas within close proximity to the Outer Route are likely to experience a perceptible change in noise levels.

3.3.5. There are 24 noise sensitive receptors located within 600m from the Outer Route. These are likely to exceed a noise level of 68 dB $LA_{10,18h}$, used as the Significant Observed Adverse Effect Level (SOAEL)[9] and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988.

MIDDLE ROUTE

3.3.6. The following NIAs are within 600m from the Middle Route:

- NIA 4822 (located along the A14, west of Akenham);
- NIA 4807 (located along the A12, east of great Bealings) and NIA 4808; and;
- NIA 4806 (located along the A12, east of great Bealings).

3.3.7. A Study Area of 600m from the Middle Route is likely to include up to 1807 dwellings located. Most of noise sensitive receptors are concentrated in Woodbridge and Witnesham. These sensitive receptors and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels.

3.3.8. There are 46 noise sensitive receptors within 80m from the Middle Route. These are likely to experience exceedance of noise levels of 68 dB LA10,18h, used as the SOAEL and the threshold for the NIR 1975, as amended 1988.

INNER ROUTE

3.3.9. There is one NIA 4822 which is located along the A14, west of Akenham, within 600m of the Inner Route.

3.3.10. There are 1381 dwellings located within 600m from the Inner Route. Most of noise sensitive receptors would be concentrated west of Martlesham and to the western edge of the Inner Route.

[8] The study area is based upon DMRB Volume 11 Section 3 Part 7 - HD 213/11 – Noise and Vibration. The 600m buffer is applied either side from the centreline of the Highway Route options.
[9] DEFRA (March 2010) Noise Policy Statement for England.

These and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels.

3.3.11. There are 12 noise sensitive receptors within 100m from the Inner Route. These are likely to experience exceedance of noise level of 68 dB LA10,18h, used as the SOAEL and the threshold for the NIR 1975, as amended 1988.

OVERALL CONCLUSIONS

3.3.12. A perceptible noise level change is likely to arise at receptor located along the proposed Highway Route options. Noise levels are likely to exceed the SOAEL and NIR absolute noise level threshold at properties within 60m to 100m from the Highway Route options.

3.3.13. The highest number of dwellings was identified within 600m from the Middle Route. The Middle Route and the Outer Route were identified as having the highest number of sensitive receptors likely to be affected in terms of noise level change.

3.3.14. Overall, the Highway Route options are likely to have Slight Adverse impacts on noise.

RECOMMENDATIONS FOR THE OBC (IF PROGRESSED)

3.3.15. A quantitative assessment using noise modelling should be undertaken to understand the likely noise impact. Noise survey and noise modelling should be carried out to establish the baseline conditions and the magnitude of impact arising from the operation of the Project.

3.4 HISTORIC ENVIRONMENT

3.4.1. Within the 500m[10] of each of the Highway Route options there are a number of key heritage constraints in terms of statutorily designated (protected) heritage assets. At this stage, non-designated heritage assets such as known and possible archaeological remains, of uncertain significance, have not been considered.

3.4.2. The location of these receptors is shown in **Appendix E**.

OUTER ROUTE

3.4.3. The key heritage constraints identified along the Outer Route are as follows:

- 1 Scheduled Monument
- 2 Grade I listed building
- 3 Grade II* listed building
- 52 Grade II listed building
- 1 Grade I Registered Park and Garden
- 1 Conservation Area

3.4.4. The Outer Route would have Large Adverse impact on the form, survival, condition and complexity of Coddenham Conservation Area due to the direct, physical impact. The Project would have a

[10] The study area follows the recommendations from the DMRB Volume 11 Section 3 Part 2 - HA 208/07– Cultural Heritage. The 500m buffer is applied either side from the centreline of the Highway Route options.

Moderate Adverse impact to the setting of the Grade I Registered Shrubland Hall Park. The Proposed Project would have a Moderate Adverse impact on the setting of two Grade I listed buildings, three Grade II* listed buildings and 52 Grade II listed buildings.

MIDDLE ROUTE

3.4.5. The key heritage constraints identified along the Middle Route are as follows:

- 1 Grade I listed building
- 5 Grade II* listed buildings
- 32 Grade II listed buildings
- 1 Grade II Registered Park and Garden
- 1 Conservation Area

3.4.6. The Middle Route would have a Moderate Adverse impact on the setting of one Grade I listed building, five Grade II* listed buildings, 32 Grade II listed buildings, one conservation area and one Grade II Registered Park or Garden. No assets would be physically impacted by the Middle Route.

INNER ROUTE

3.4.7. The key heritage constraints identified along the Inner Route are as follows:

- 3 Scheduled Monuments
- 3 Grade II* listed buildings
- 21 Grade II listed buildings

3.4.8. The Inner Route would have a Moderate Adverse impact on the setting of three Grade II* listed buildings, 21 Grade II listed buildings and three Scheduled Monuments. No designated heritage assets would be physically impacted by the Inner Route.

OVERALL CONCLUSIONS

3.4.9. Impacts on designated heritage assets would occur during the construction and operational phases.

3.4.10. Construction activities may result in permanent physical alteration to designated heritage assets (demolition, alteration) along with temporary impacts to setting through construction noise and lighting. The Grade I Registered Park, Shrubland Hall, and Coddenham Conservation Area are of particular concern.

3.4.11. Potential impacts could occur during the operational phase on the historic environment through permanent or long-term impacts to the setting of designated heritage assets from the presence of new built elements, such as road surfaces, bridge structures and embankments. Direct physical impacts on below ground heritage assets would be expected on all three routes from construction activities.

3.4.12. Given the direct impacts on designated heritage assets, the Highway Route option which has the highest impacts on designated heritage assets is the Outer Route option. The Highway Route option which impacts the fewest designated heritage assets is the Inner Route option.

RECOMMENDATION FOR THE OBC (IF PROGRESSED)

3.4.13. At this stage no detailed impact assessment has taken place. The historic environment impacts of the Proposed Project are currently unknown and would need to be investigated further at OBC-stage.

3.5 LANDSCAPE

3.5.1. The Study Area for landscape is a 2km radius from the centreline of each proposed Highway Route option[11].

3.5.2. The Highway Route options do not cross an Areas of Outstanding Natural Beauty (AONBs). The closest Area of Outstanding Natural Beauty (AONB) is Suffolk Coast and Heaths AONB. This AONB is a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain. The Inner Route option is located 500m from the AONB. The Outer Route option and the Middle Route option are located 2km from the AONB. These are shown in **Figure 1** in **Appendix A.**

3.5.3. Within the Study Area, the Highway Route options cross three distinct National Character Areas (NCAs). These are South Norfolk and High Suffolk Claylands, South Suffolk and North Essex Clayland, and Suffolk Coast and Heaths[12]. Between these NCAs, the Highway Route options lie within widely varying local landscape character types, each containing a variety of landcover, landscape patterns and levels of tranquillity, including lowland agricultural areas and scattered settlements.

3.5.4. There is evidence of a rich cultural heritage in the Study Area, with the Highway Route options located within close proximity to numerous cultural heritage designations including Scheduled Monuments, a Grade I Registered Parks and Gardens (Shrubland Hall), Coddenham Conservation Area and numerous Listed Buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to settlements in the east and west.

3.5.5. The Highway Route options are likely to have a Moderate Adverse effect on the landscape pattern, tranquillity, culture and landcover particularly in relation to views as new stretches of road are created on undeveloped land, new urbanising elements are introduced to the landscape and landscape features are removed. Even with mitigation the Highways Route options would be at odds with the local landscape pattern and landform, and would reduce visual amenity and levels of tranquillity.

3.5.6. There is a local landscape designation within the Study Area, namely SSP38 – Special Landscape Area, which includes the valleys and tributaries of the Rivers Alde, Blyth, Deben, Fynn, Hundred, Mill, Minsmere, Ore and Yox and the Parks and Gardens of Historic or Landscape Interest identified in policy SSP38. This area is intersected by all Highway Route options. The extent of SSP38 is displayed on **Figure 1** in **Appendix A**. Suffolk Coastal Local Plan: Saved Policies (2013) highlights that there are areas within Suffolk with special landscape attributes, which are particularly vulnerable

[11] The Study Area for landscape is based on professional experience and knowledge of schemes of a similar size and nature.

[12] Gov.uk (2019). National Character Area profiles. Available online at: https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles [Accessed 11/04/2019].

to change. Saved Policy no. AP13 ('Special Landscape Areas') states the following *'The District Council will ensure that no development will take place which would be to the material detriment of, or materially detract from, the special landscape quality'*. Given this, the Highway Route options are likely to have a Moderate Adverse effect on this feature.

RECOMMENDATIONS FOR THE OBC (IF PROGRESSED)

3.5.7. Should Highway Route option(s) be taken forward at OBC-stage, it is recommended to undertake further assessment to ascertain the physical impact of the Proposed Project on landscape features (including the SSP38 – Special Landscape Area) and to identify potential mitigation measures to help preserve the quality of the landscape along the proposed Highway Route option(s).

3.6 BIODIVERSITY[13]

3.6.1. Fourteen European designated sites[14] are located within the 20km Study Area[15], as shown in **Figure 2** in **Appendix A**. No Highway Route option crosses a European designated site. The closest European designated site is the Deben Estuary Special Protection Area (SPA) and Ramsar site, located approximately 1.3km from the Middle Route at the closest point.

3.6.2. Six SSSIs are located within the 2km Study Area, the nearest of which is Sinks Valley, Kesgrave, located approximately 200m south of the Inner Route at the closets point. No Highway Route option crosses a SSSI. Two Local Nature Reserves (LNRs) are present within the Study Area, the closest of which is Rede Wood, located approximately 800m north of the Middle and Inner routes. No Highway Route option crosses an LNR. These are shown in **Figure 3** in **Appendix A**.

3.6.3. Twenty-Five County Wildlife Sites (CWSs) have been identified within the 500m Study Area including one which may meet SSSI criteria (Shrubland Park CWS) due to the invertebrate and plant species it supports. The Outer Route crosses three CWS, the Middle Route crosses two CWS and the Inner Route crosses one CWS and lies adjacent to a further two CWS. These are shown in **Figure 3** in **Appendix A**.

3.6.4. Ancient Woodland is also present in the Study Area. Ancient woodland is defined as irreplaceable habitat and is protected under the National Planning Policy Framework (NPPF) 2019[16]. The NPPF states that: *"development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists"*. The Inner Highway Route lies directly adjacent to an area of ancient woodland at Lux Wood (also a CWS) which is therefore likely

[13] Study Areas mentioned in this section follows recommendation from DMRB Volume 11 Section 3 Part 4 – Ecology and Nature Conservation. These refer to the radius from the centreline of each Highway Route option.
[14] These include Ramsar sites, Special Protected Areas (SPA) and Special Areas of Conservation (SAC)
[15] Magic (2019). Magic Website. Available at: https://magic.defra.gov.uk/MagicMap.aspx. Last accessed 11/04/2019
[16] Ministry of Housing, Communities and Local Government (2019). National Planning Policy Framework. February 2019. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf [Accessed 15/04/2019].

to be impacted by construction. The Middle Highway Route lies in close proximity to ancient woodland at Blunts Wood (also a CWS). These are shown in **Figure 3** in **Appendix A**.

3.6.5. There are a number of Habitats of Principal Importance (HPIs) located within the Study Area and several are crossed by the Highway Route options. These habitats include deciduous woodland, coastal floodplain grazing marsh, lowland meadow, lowland dry acid grassland, traditional orchard and lowland heathland. HPIs are habitats identified as being of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act (2006). These are shown in **Figure 1** in **Appendix A**.

3.6.6. Records of several protected and notable species were returned within the Study Area, including but not limited to: great crested newt *Triturus cristatus*, badger *Meles meles*, hazel dormouse *Muscardinus avellanarius*, otter *Lutra lutra*, water vole *Arvicola amphibius*, bat species including barbastelle *Barbastella barbastellus*, as well as birds, protected plant species and reptiles.

MANAGING RISKS TO PROGRAMME AT OBC-STAGE FOR ECOLOGY SURVEYS (IF PROGRESSED)

3.6.7. Following the completion of the WebTAG appraisal, an extended Phase 1 habitat survey is recommended on the preferred Highway Route options to inform the OBC-stage. The findings of the Phase 1 habitat survey and detailed desk-top review would be reported in a Preliminary Ecological Appraisal report. The report would provide a discussion of relevant legislation and planning policy pertaining to biodiversity and make Project specific recommendations for further survey as appropriate. Mitigation measures (including avoidance, mitigation and compensation) would be outlined where possible. Further survey of habitats and species are likely to be recommended, to be undertaken at appropriate times of year, as advised by a suitability qualified ecologist.

3.6.8. Although ecology surveys are not undertaken at the SOBC-stage, it is recommended to consider this constraint in the overall planning to ensure that the ecology survey results are available at the start of the OBC-stage in order to prevent this delaying the delivery of the OBC.

3.7 WATER ENVIRONMENT

3.7.1. The Study Area for water environment is a 1km radius from the centreline of each proposed Highway Route option[17].

3.7.2. The Outer Route crosses two main rivers, Coddenham Watercourse and the River Lark. The Middle Route crosses three main rivers: the River Gipping, the River Lark and the River Fynn. The Inner Route crosses one main river, the River Gipping as well as some other minor watercourses. These are shown in Figure 1 in Appendix A. There are also a large number of watercourses, field drains and ponds within 1km of the Highway Route options.

[17] The Study Area for water environment is based on professional experience and knowledge of schemes of a similar size and nature. It comprises any surface or groundwater bodies or water dependent conservation sites located up to 1km downstream of the Highway Route options.

3.7.3. The Inner Route crosses over an unnamed watercourse that supports Sinks Valley, Kesgrave (SSSI). Sinks Valley, Kesgrave SSSI is upstream and it is unlikely that this designation would be affected by the Inner Route. The unnamed watercourse feeds into the River Fynn.

3.7.4. The River Fynn and River Lark are both tributaries of the Deben Estuary (see Figure 2 in Appendix A) which is a designated Ramsar, SSSI and SPA. The River Gipping flows into the Orwell estuary (see Figure 2 in Appendix A) which is also designated as a Ramsar, SPA and SSSI. It is unlikely that the Highway Route options would have noticeable effects on the water quality and ecological function of these water bodies.

3.7.5. Chemical quality is 'good'[18] on the River Gipping (Gipping catchment), the River Lark (Deben catchment) and the River Fynn (Deben catchment) but the waterbodies are not currently meeting ecological objectives with all three attaining moderate biological status. The reasons for not achieving good status (RANGS) relate predominantly to agriculture and rural land management and industry, water industry and urban and transport. There are surface water abstractions and parts of the Project corridor are classified as a protected Surface Water Safeguarded Zone for water supplies. Standard measures associated with managing the quality and flow rate of surface water would help mitigate the water quality impacts of the proposed Highway Route options.

3.7.6. Surrounding areas to the three Highway Route options are classified as predominantly Flood Risk Zone 1 (<0.1% annual chance of flooding) with localised areas of Flood Risk Zone 2 (0.1-1% annual chance of flooding) and Flood Risk Zone 3 (>1% annual chance of flooding) surrounding the main rivers and tributaries (low, medium and high risk of flooding respectively). This risk is associated with the fluvial flooding from the main rivers identified.

3.7.7. Some sections of the Highway Route options are crossing a Flood Zone 3b - Functional Floodplain. The Outer Route crosses a small section of Coddenham Watercourse floodplain which is classed as a Flood Zone 3b, and both the Inner Route and the Middle Route are crossing a section of the floodplain of the River Gipping which is classed as Flood Zone 3b. In accordance with the NPPF development in Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road Projects there must be demonstration that the Project has limited works in the floodplain as much as economically viable; and that the Project as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere. Some crossings of rivers may reduce the capacity and function of the fluvial floodplain and this may increase the overall risk of flooding. This overall impact is considered to be significant for the River Gipping and of low significance for the Coddenham Watercourse.

3.7.8. The Study Area comprises three types of Groundwater Source Protection Zones (SPZs). These include an Inner Protection Zone (Zone I), an Outer Protection Zone (Zone II) and a Total Catchment (Zone III).

[18] Environment Agency (2019). Catchment Data Explorer. Available online at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB105035046280. Last Accessed: 04/09/2019

3.7.9. There are water abstraction licenses from groundwater sources. The Highway Route options lie within a zone classified as a mixture of major and minor aquifers with low / intermediate / high groundwater vulnerability. Although groundwork's could lead to the leaching of pollutants into the groundwater, the potential impact is likely to be of low significance to groundwater resources.

RECOMMENDATIONS FOR THE OBC (IF PROGRESSED)

3.7.10. At OBC-stage, it is recommended to undertake further assessment to inform the design and to minimise as far as possible the potential impacts of the selected Highway Route option(s) on the capacity and function of the fluvial floodplain. This approach would ensure that there is no or limited overall increase in flood risk.

3.7.11. Hydraulic modelling of the selected Highway Route option(s) is likely to be required to demonstrate that the proposed crossing would not increase the depth, extent or rate of inundation of flooding to people, property and infrastructure elsewhere; and that flood flow conveyance can be maintained. Consultation would be required with the Environment Agency to determine the suitability of the existing models and agree the scope of the hydraulic assessments. Flood compensation requirement would also need to be reviewed.

4 ENVIRONMENTAL AND PLANNING POLICY REVIEW

4.1.1. A high-level environmental and planning policy review was undertaken at the SOBC-stage to ensure that the proposed Highway Route options are in line with the existing planning and environmental policy objectives sets out the relevant European Directives, UK legislation and national policy.

4.1.2. The full details about the environmental and planning policy of relevance to the Proposed Project are presented in Appendix F. The key findings from this review are presented below.

4.2 NATIONAL PLANNING POLICY FRAMEWORK

4.2.1. The NPPF provides a framework for designation of the local plans by local authorities and for the consideration of planning applications in England. The policy puts a presumption in favour of sustainable development at the heart of decision making for planning applications made to the local authority.

4.2.2. Paragraph 3 of the NPPF confirms that the framework does not contain any specific policies for nationally significant infrastructure projects as contained in national policy statements. However, paragraph 3.3 of National Policy Statement for National Networks (NPSNN) expects applicants to avoid and mitigate environmental and social impacts of Projects in line with the principles set out in the NPPF and the Government's planning guidance.

4.3 NATIONAL POLICY STATEMENT FOR NATIONAL NETWORKS

4.3.1. The NPSNN sets out Government policy for the need for, and delivery of, nationally significant road and rail projects. The policy states that the Government will deliver national networks that meet the long term needs of the country and support a thriving and prosperous economy.

4.3.2. The NPSNN sets out a critical need to improve the road network to address congestion, providing safe, resilient and expeditious networks which support social and economic activity. These improvements shall also address impacts of networks on quality of life and the environment (NSPNN paragraph 2.2). A well-functioning road network is stated as critical for supporting national and regional economies (NSPNN paragraph 2.13). The Government's policy to address this need is to bring forward enhancements and improvements to the existing network. This includes improvements to trunk roads, in particular dualling of single carriageway strategic trunk roads to increase capacity and improve performance and resilience.

4.3.3. The NPSNN sets out that networks should be designed to minimise social and environmental impacts and improve quality of life and should follow the principles of the NPPF and Planning Practice Guidance (PPG), as well detailed policy set out in Chapter 5 of the NPSNN should be followed to mitigate effects. It highlights that when considering an application for development consent, the Secretary of State will consider its benefits including for economic growth, job creation, and environmental improvement. This will be considered against adverse impacts of the Project including long-term cumulative impacts. Such applications are required to be supported by a business case prepared in accordance with Treasury Green Book principles.

4.3.4. The policy states that projects subject to The Infrastructure Planning Environmental Impact Assessment (EIA) Regulations 2009 should include an environmental statement with the application. As part of this, the impacts from reasonably foreseeable Projects should be considered in the assessment. The maximum extent of the project's possible impact should be assessed where there

are details which are yet to be finalised. The policy also sets out that the application should provide sufficient information for the carrying out of an appropriate assessment by the Secretary of State for Transport, where proposals are likely to have a significant effect on a European designated site. It requires principles of good design to inform projects from their inception. Chapter 5 of the NPSNN sets out the assessment framework against which the application will be considered.

4.4 LOCAL POLICY

4.4.1. The Proposed Project falls within the administrative boundaries of the following local authorities: East Suffolk District Council (ESDC) (formed in April 2019 of the following local planning authorities: Suffolk Coastal District Council and Waveney District Council); Babergh, Mid Suffolk District Councils (BMSDC) and Ipswich Borough Council (IBC).

4.4.2. Relevant local planning policy documents have been considered and reviewed in relation to the Proposed Project. The key local policies reviewed are listed below. The full detailed review of the local policies is included in **Appendix A**.

- The Suffolk Coastal Local Plan (2013)
- The Suffolk Local Transport Plan (SLTP) 2011 – 2031;
- Suffolk Minerals & Waste Development Framework: Minerals Core Strategy (2008);
- Mid Suffolk's Core Strategy 2008;
- Mid Suffolk Local Plan (1998) and proposals map
- Ipswich Local Plan 2011-2031 including Core Strategy and Policies Development Plan Document (DPD) Review; Adopted Site Allocations and Policies and Policies Map;
- Ipswich Borough Council: New Local Plan Review
- Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014);
- Babergh District Council: Local Plan (2006);

4.5 OTHER POLICY AND GUIDANCE

4.5.1. There are also other policy and guidance which have been considered in relation to the Proposed Project. This section provides a high level review of environmental matters arising from the Proposed Project against the relevant planning and environmental policies. The full list of reviewed environmental policies and guidance is provided in **Part 2** of **Appendix F**.

NOISE AND VIBRATION

4.5.2. Ipswich Local Plan 2011-2031 strongly advises that where the sensitive receptors are significantly impacted by new developments, appropriate mitigation measures need to be put in place for example through condition of the consent. The condition may require for example putting up the environmental barriers. The policy also highlights that the change to the route options may have to be considered if there is a potential for a significant impact where mitigation measures will not be sufficient.

4.5.3. The NPPF however, recognises that developments will often create some noise impacts and that developments should not have unreasonable restrictions put on them.

4.5.4. Additionally, the NPSNN requires that where the major transport infrastructure projects are subject to significant noise impacts, the EIA and the Noise Impact Assessment for such projects will have to be produced and submitted to the Secretary of State with the application.

AIR QUALITY/GREENHOUSE GASES

4.5.5. The European Union (EU) Ambient Air Quality Directive (2008/50/EC) stresses the importance of reduction of emissions from the road transport. It sets out the limit values for concentrations in outdoor air of key air pollutants that may have an impact on public health, these include a nitrogen dioxide (NO2) and small particles known as PM10 and PM2.5.

4.5.6. The NPSNN also highlights the importance of reducing emissions of pollutants affecting the air quality. It states that although the impact of road developments on aggregate levels of emissions are likely to be very small, the impacts of road development need to be seen against significant projected reductions in carbon emissions and improvements in air quality as a result of current and future policies to meet the Government's carbon budgets and the EU's air quality limit values. The NPSNN sets out the requirements for applicant's assessment and the Secretary of State's responsibilities in decision making and mitigation measures to ensure that new developments address significant effects and to assess compliance risk with regard to the Ambient Air Quality Directive (2008/50/EC). NPSNN supports the switch to Ultra Low Emission Vehicles (ULEVs), and predicts that increases to emissions as a result of improvements to the road network will be very small as a result of current and future commitments to meet legally binding targets.

4.5.7. The Suffolk Coastal District Local Plan (SCDLP) (2013, reviewed in 2019) also stresses the importance for addressing issues of air quality in the County noting that there is an Air Quality Management Area (AQMA) (located in the North-Western part of Ipswich, on Chevallier Street).

HISTORIC ENVIRONMENT

4.5.8. The Planning Act 1990 outlines special measures and controls which should be considered when carrying out developments that could affect buildings and areas of special architectural or historic interest. The SCDLP 2013 strongly supports the objective of the NPPF which aims to conserve heritage assets in a manner appropriate to their significance. The NPPF highlights that when considering the impact of the proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Furthermore, it states that any harm to, or loss of, the significance of a designated heritage asset should require clear and convincing justification.

4.5.9. NPSNN for major transport infrastructure developments highlights that Appraisal of Sustainability to address the impacts on the cultural heritage will be required from the applicants upon submission of the application. The NPSNN highlights that whilst the applicants should deliver new road developments, it also states that the significance of some effects and effectiveness of mitigation maybe uncertain at the strategic non-locational level. NPSNN suggests that developments should be delivered in Government's policy and environmentally sensitive way with consideration for environmental benefits noting at the same time that some adverse local effects of development may still remain.

BIODIVERSITY

4.5.10. The NPSNN highlights that where the project is subject to EIA, the applicant should produce the Environmental Statement (ES) clearly setting out the likely significant effects on the designated sites of ecological or geological conservation importance on protected species, habitats and other species

identified as being of principal importance for the conservation of biodiversity. The ES should consider the full range of potential impacts on ecosystems. Additionally, the NPSNN requires the applicant to show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests. All local policies consistently support the protection of the local biodiversity and geodiversity through implementation of appropriate mitigation measures. The proposed development must also be considered against the relevant Habitats Regulations and if required, provide a full Habitat Regulations Assessment Report.

4.5.11. NPSNN highlights the importance of irreplaceable habitats including ancient woodland and veteran trees. Para 5.32 states that ancient woodland is a valuable biodiversity and once lost it cannot be recreated. It highlights that the Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland unless the national need for and benefits of the development, in that location, clearly outweigh the loss. The NPPF also highlights the same principle and states that development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists).

LANDSCAPE

4.5.12. The NPSNN clearly highlights that developments should aim to minimise harm to the landscape and townscape and provide reasonable mitigation measures where possible to compensate for visual intrusion. It also states that those developments outside of the national designations, but which might affect them should be designed sensitively considering relevant constraints.

4.5.13. The Development Management Policy DM5 of the Ipswich Local Plan (2011-2031) highlights that the special character of Ipswich should be protected and enhanced. It requires that Detailed Landscape Assessment for new developments which may have a visual effect on landscape and of the area affected by proposed development is produced.

DRAINAGE & WATER ENVIRONMENT

4.5.14. In accordance with the Flood and Water Management Act 2010, the Environment Agency (EA) must be consulted with regards to developments which may be affected by, or may add to, flood risk to seek sufficiently early pre-application discussions with the EA, and, where relevant, other flood risk management bodies such as lead local flood authorities, Internal Drainage Boards (IDBs), sewerage undertakers, highways authorities and reservoir owners and operators.

4.5.15. NPSNN requires that the surface water flood issues need to be understood and then account of these issues can be taken. The NPSNN states that in decision-making, the Secretary of State will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the Water Framework Directive. It should be noted that the Projects will likely present greater challenges, but with appropriate consultation with the EA and Lead Local Flood Authorities, and assuming a Flood Risk Assessment is undertaken, and design features are implemented in accordance with best practice, the proposals are likely to be compliant with national policy and unlikely to be at risk of increasing flood risk or affecting water quality.

TRANSPORT

4.5.16. The NPSNN expects applicants to use reasonable endeavours to address the needs of pedestrians and cyclists. This includes investing in locations where the national road network severs communities and acts as a barrier to cycling and walking by addressing historic problems, retrofitting solutions, and ensuring safety for cyclists on junctions. It highlights the UK Government intends to remain a world leader in road safety, and Project promoters are expected to take opportunities to improve road safety, employing the most modern and effective safety measures where proportionate.

4.5.17. NPSNN requires use of innovative technologies will be monitored for their benefits and risks, but are not expected to alleviate the need to address current congestion problems or negate the need for improvements to the road network. It states that applicants should improve access wherever possible through delivering Projects which take all opportunities for improvements in accessibility for all users, including disabled users, of the strategic road network. The NPSNN does not intend to introduce road pricing for key trunk roads on the strategic road network. Chapter 4 of NPSNN sets out the assessment principles for the consideration of highway schemes. In particular, it states that subject to the detailed policies and protections in this NPSNN, and the legal constraints set out in the Planning Act, that there is a presumption in favour of granting development consent for NSIP projects, such as the Proposed Project.

4.5.18. The Suffolk Coastal District Local Plan (2013) aims to improve transport, environmental and community infrastructure to support growth in the region. It identifies that transport and accessibility are key economic issues and aims to tackle poor access to jobs, both in terms of the quality of the transport system; the efficient functioning of the A14 as an important international and local transport route. The Suffolk Local Transport Plan (SLTP) 2011 – 2031, outlines the long-term ambitions for improving the transport network in the County. The Policy CS5 (‘Improving Accessibility’) states that there is a need for optimising the accessibility of new developments without increasing the congestion, where Policy C17 (‘Delivering Infrastructure’) highlights that for development to take place in an appropriate manner, it is essential to give consideration to the infrastructure needs associated with the levels of development proposed. As for Policy CS15 (‘Implementing Sustainable Development in Babergh’) of the Babergh District Council Local Plan 2011-2031 (2014), it seeks to improve and provide access to services. The Rural Development and Core Strategy Policy CS11 SPD (2014) of Babergh District Council (2014) also highlights the importance of improving accessibility across the district.

5 PLANNING AND CONSENT

5.1.1. Given the scale of the Highway Route options, the Proposed Project is likely to require an EIA and there are currently two consenting routes available to SCC:

- Development Consent Order (DCO) under the Planning Act 2008 (as amended); or
- Planning permission under the Town and Country Planning Act 1990 (as amended).

5.1.2. Each consenting route is detailed further in **Appendix G**.

5.1.3. It is important to note that the WebTAG/SOBC process may not cover all the relevant considerations necessary to support the option selection process for a DCO. Should SCC decide to progress forward with the DCO under the Planning Act 2008 (as amended), WSP recommends that a robust option appraisal be undertaken to support the DCO examination process in the future.

5.1.4. A more rigorous review of potential DCO requirements is recommended at the OBC-stage (if progressed).

6 APPRAISAL SPECIFICATION SUMMARY TABLE

6.1.1. The Appraisal Specification Summary table (ASST) summarises the appraisal approach and the information against each of the sub-impacts presented in the Appraisal Summary Table (AST).

Table 6-1 - Environmental Appraisal Specification Summary table

Impacts	Sub-impacts	Estimated Impact	Level of uncertainty	Proposed proportionate appraisal methodology	Reference to evidence and rationale in support of proposed methodology	Type of Assessment Output (Quantitative/ Qualitative/ Monetary/ Distributional)
Environmental	Noise	Slight Adverse	High	Desk-based review (including counts of sensitive receptors and review of traffic data), high level appraisal, WebTAG guidance	TAG Unit A3, Section 2	Qualitative
	Air Quality	Slight Adverse	High	Desk-based review (including counts of sensitive receptors and review of traffic data), high level appraisal, WebTAG guidance	TAG Unit A3, Section 3	Qualitative
	Greenhouse gases	Neutral	Medium	High level appraisal, WebTAG guidance	TAG Unit A3, Section 4	Qualitative

Impacts	Sub-impacts	Estimated Impact	Level of uncertainty	Proposed proportionate appraisal methodology	Reference to evidence and rationale in support of proposed methodology	Type of Assessment Output (Quantitative/ Qualitative/ Monetary/ Distributional)
	Landscape	Moderate Adverse	Medium	Desk-based review, high level appraisal, WebTAG guidance	TAG Unit A3, Section 6	Qualitative
	Historic Environment	Moderate Adverse to Large Adverse	Medium	Desk-based review, high level appraisal, WebTAG guidance	TAG Unit A3, Section 8	Qualitative
	Biodiversity	Large Adverse	High	Desk-based review (including the review of biological records), high level appraisal, WebTAG guidance	TAG Unit A3, Section 9	Qualitative
	Water Environment	Slight Adverse to Moderate Adverse	Medium	Desk-based review, high level appraisal, WebTAG guidance	TAG Unit A3, Section 10	Qualitative

Appendix A

FIGURES

Drawn By:

Coddenham Watercourse

River Lark

River Flynn

River Gipping

Mill River

Legend

- 200m Buffer of Outer Route
- 200m Buffer of Middle Route
- 200m Buffer of Inner Route
- Housing project boundary
- Urban Areas

Historic Environment

- Grade I
- Grade II*
- Grade II
- Scheduled monuments
- Conservation areas

Sensitive Receptors

- Nursery
- Primary
- Secondary

Utilities

- Electricity overhead
- High pressure gas pipelines
- Medium pressure gas pipelines
- Low pressure gas pipelines
- Buried telecommunications
- Virgin media
- East Anglia One buried power route

Protected Areas

- Area of Outstanding Natural Beauty
- Local Nature Reserve
- Site of Special Scientific Interest
- Special Landscape Area SSP38
- Ramsar Site - Wetland of international importance

Priority Habitats Inventory

- Ancient woodland inventory
- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Mudflats
- Reedbeds
- Traditional orchard
- No main habitat but additional habitats

Water Environment

- Flood zone 3
- Flood zone 2
- Suffolk river valleys
- Statutory main rivers

Parks and Gardens

- Grade I
- Grade II
- Grade II*

0 0.25 0.5 1 1.5 2 kilometers

File:

FINAL

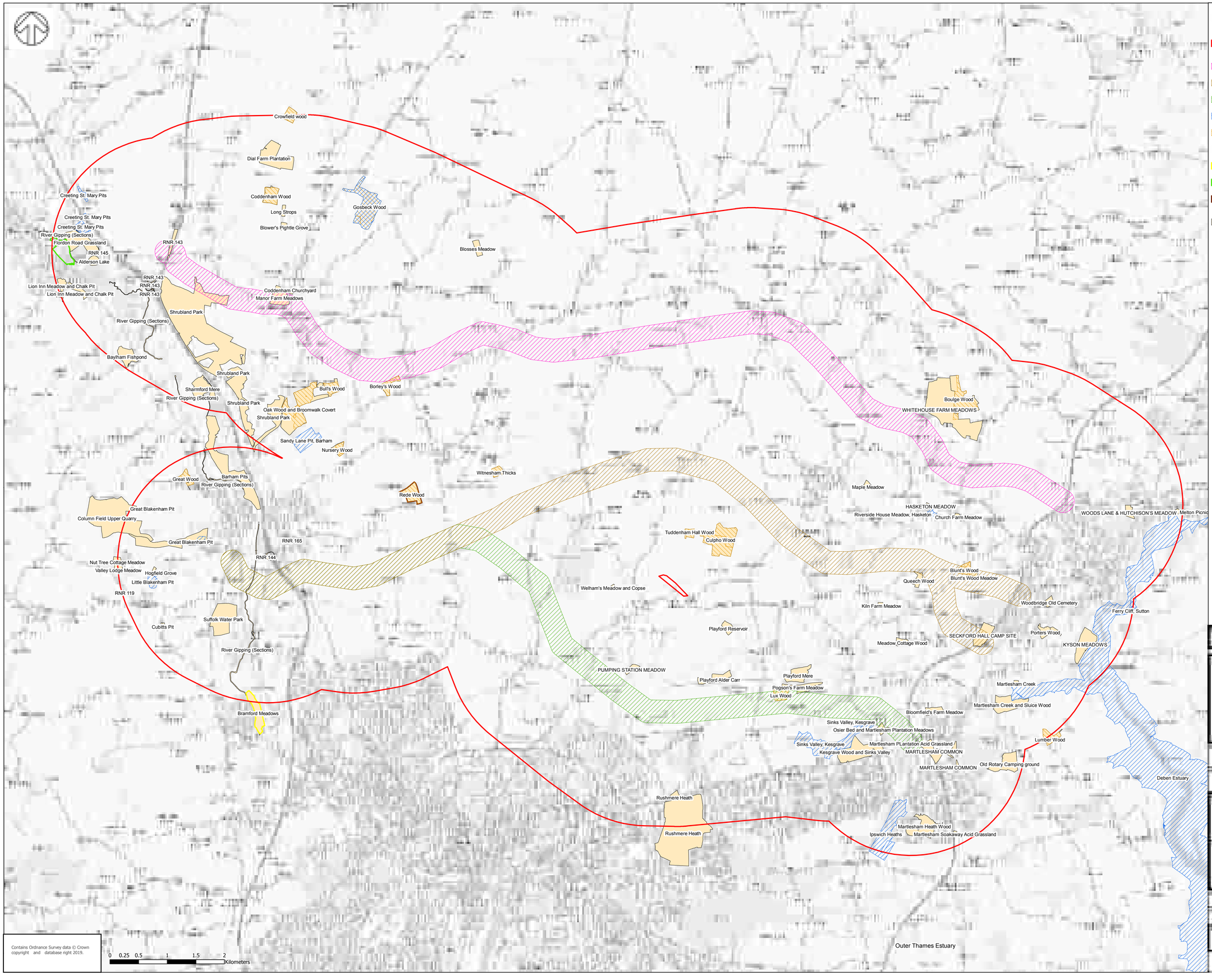
SUFFOLK COUNTY COUNCIL

GREATER IPSWICH NORTHERN TRANSPORT STUDY

FIGURE 22-ENVIRONMENTAL CONSTRAINTS

1:30,000	CHK	APP
WSP - A1 Landscape	LH	19/01/2020
70044285	WSP-INR-TP-SHP-022	

Drawn By:



Legend

- 2km buffer from Highway Route options
- 200m Buffer of Outer Route
- 200m Buffer of Middle Route
- 200m Buffer of Inner Route
- Sites of Special Scientific Interest
- Ancient Woodland

Local Nature Reserves

- Bramford Meadows
- Needham Lake
- Rede Wood
- County Wildlife Sites (including Roadside Nature Reserves)

0 0.25 0.5 1 1.5 2 Kilometers

FOR INFORMATION ONLY

Suffolk County Council

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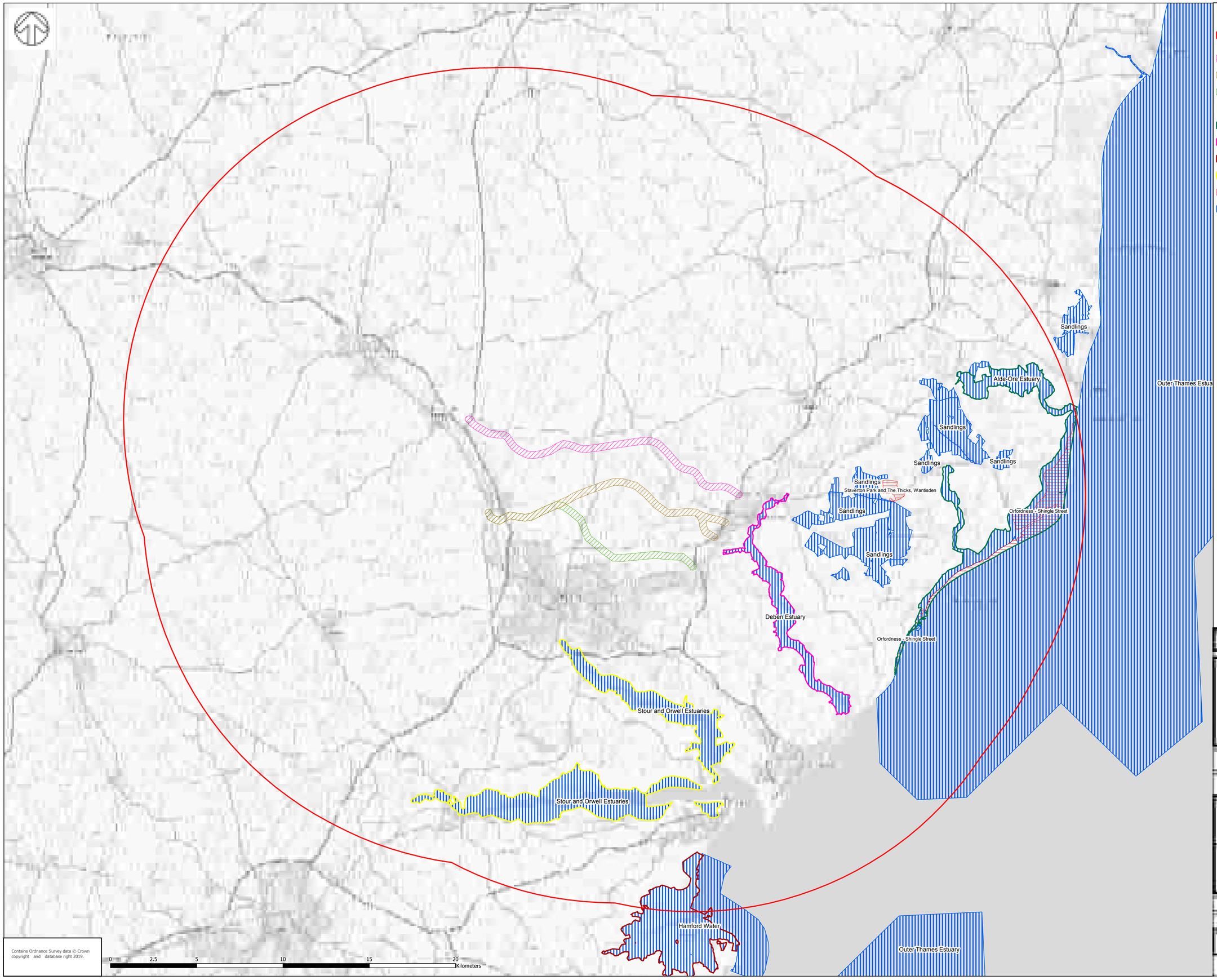
GREATER IPSWICH NORTHERN TRANSPORT STUDY

FIGURE 3- OTHER DESIGNATION SITES

1:30,000	AP	ACB
WSP - A1 Landscape	LH	23/07/2019
70044285	WSP-INR-TP-SHP-028	P01

File:

Drawn By:



Legend

- 20km buffer from Highway Route options
- 200m Buffer of Outer Route
- 200m Buffer of Middle Route
- 200m Buffer of Inner Route

Ramsar Sites

- Alde-Ore Estuary
- Deben Estuary
- Hamford Water
- Stour and Orwell Estuaries
- Special Areas of Conservation
- Special Protection Areas

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GREATER IPSWICH NORTHERN TRANSPORT STUDY

FIGURE 2- EUROPEAN DESIGNATION SITES

1:100,000	AP	ACB
WSP - A1 Landscape	LH	23/07/2019
70044285	WSP-INR-TP-SHP-029	P01

File:

Appendix B

WEBTAG WORKSHEETS

Noise WebTAG Worksheets

Noise Workbook - Worksheet 1

Proposal Name: INR - Inner Route Option 2D

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road, Rail or Aviation):	road

Net present value of change in noise (£):	#N/A

*positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	#N/A
Net present value of impact on amenity (£):	#N/A
Net present value of impact on AMI (£):	#N/A
Net present value of impact on stroke (£):	#N/A
Net present value of impact on dementia (£):	#N/A

Quantitative results

Households experiencing increased daytime noise in forecast year:	
Households experiencing reduced daytime noise in forecast year:	
Households experiencing increased night time noise in forecast year:	n/a
Households experiencing reduced night time noise in forecast year:	n/a

Qualitative Comments:

Potential receptors along this route option: Sensitive receptors (properties) within 600m from the route option are likely to include approximately 1381 dwellings. Most of noise sensitive receptors will be concentrated west of Wartlesham and Woodbridge and western edge of the route option. These and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels. There is also one Noise Important Area within 600m from this route, namely NIA 4822 (located along the A14, west of Akenham).

Sensitivity: High - residential receptors and other non-residential receptors within the study area are considered to have a high sensitivity to noise changes that may result from the construction and operation activities of the proposed route option.

Magnitude of impact: Approximately 12 noise sensitive receptors within 100m from the proposed route are likely to exceed a noise level of 68 dB LA10,18h, used as the Significant Observed Adverse Effect Level (SOAEL) and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988.

Overall impact and description: A perceptible noise level change is likely to arise at sensitive receptors located along the route option. Noise levels are likely to exceed the SOAEL and NIR absolute noise level threshold at properties within100m from the route option. The potential impacts of the Highway Route option on noise are anticipated to be **Slight Adverse**.

Data Sources:

Traffic data used in this assessment was prepared by the WSP Transport team and the format follows the requirements in the 'Calculation of road Traffic Noise (CRTN), 1988, and DMRB HD 213/11.

Noise Workbook - Worksheet 1

Proposal Name: INR - Middle Route (Tie-in Options 2B and 2C)

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road, Rail or Aviation):	road

Net present value of change in noise (£):	#N/A

*positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	#N/A
Net present value of impact on amenity (£):	#N/A
Net present value of impact on AMI (£):	#N/A
Net present value of impact on stroke (£):	#N/A
Net present value of impact on dementia (£):	#N/A

Quantitative results

Households experiencing increased daytime noise in forecast year:	
Households experiencing reduced daytime noise in forecast year:	
Households experiencing increased night time noise in forecast year:	
Households experiencing reduced night time noise in forecast year:	

Qualitative Comments:

Potential receptors along this route option: Sensitive receptors (properties) within 600m from the Middle Route are likely to include approximately 1807 dwellings from Option 2B (ie. tie-in to A12) and 899 dwellings Option 2C (ie. tie-in to roundabout joining B1438). Most of noise sensitive receptors will be concentrated in Woodbridge and Witnesham. These and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels.

There are also four Noise Important Areas within 600m of the Middle Route: NIA 4822 (located along the A14, west of Akenham) within 600m from Option 2B and Option 2C; NIA 4807 (located along the A12, east of great Bealings) and NIA 4808 within 600m from the alignment of Option 2B; and NIA 4806 (located along the A12, east of great Bealings) within 600m from the alignment of Option 2C.

Sensitivity: High - residential receptors and other non-residential receptors within the study area are considered to have a high sensitivity to noise changes that may result from the construction and operation activities of the Middle Route.

Magnitude of impact: Approximately 46 noise sensitive receptors within 80m from the Middle Route are likely to exceed a noise level of 68 dB LA10,18h, used as the Significant Observed Adverse Effect Level (SOAEL) and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988.

Overall impact and description: A perceptible noise level change is likely to arise from all options at sensitive receptors located along the Middle Route. Noise levels are likely to exceed the SOAEL and NIR absolute noise level threshold at properties within 80m from the Middle Route. The potential impacts of the Middle Route on noise are anticipated to be **Slight Adverse**.

Data Sources:

Traffic data used in this assessment was prepared by the WSP Transport team and the format follows the requirements in the 'Calculation of road Traffic Noise (CRTN), 1988, and DMRB HD 213/11.

Noise Workbook - Worksheet 1

Proposal Name: INR - Outer Route Option 1A

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road, Rail or Aviation):	road

Net present value of change in noise (£):	#N/A

*positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	#N/A
Net present value of impact on amenity (£):	#N/A
Net present value of impact on AMI (£):	#N/A
Net present value of impact on stroke (£):	#N/A
Net present value of impact on dementia (£):	#N/A

Quantitative results

Households experiencing increased daytime noise in forecast year:	
Households experiencing reduced daytime noise in forecast year:	
Households experiencing increased night time noise in forecast year:	
Households experiencing reduced night time noise in forecast year:	

Qualitative Comments:

Potential receptors along this route option: Sensitive receptors (properties) within 600m from the route are likely to include approximately 1452 dwellings. Most of noise sensitive receptors will be concentrated to the eastern edge of the route. These sensitive receptors and low density populated areas within close proximity to the route option are likely to experience a perceptible change in noise levels. There are two Noise Important Areas (NIAs) located within the 600m of the route option. These are NIA 11332 (located along the A140, west of Coddenham) and NIA 4810 (located along the A12, east of Woodbridge).

Sensitivity: High - residential receptors and other non-residential receptors within the study area are considered to have a high sensitivity to noise changes that may result from the construction and operation activities of the proposed route option.

Magnitude of impact: Approximately 24 noise sensitive receptors within 60m from the proposed route are likely to exceed a noise level of 68 dB LA10,18h, used as the Significant Observed Adverse Effect Level (SOAEL) and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988.

Overall impact and description: A perceptible noise level change is likely to arise at sensitive receptors located along the route option. Noise levels are likely to exceed the SOAEL and NIR absolute noise level threshold at properties within 60m from the route option. The potential impacts of the Highway Route option on noise are anticipated to be Slight Adverse.

Data Sources:

Traffic data used in this assessment was prepared by the WSP Transport team and the format follows the requirements in the 'Calculation of road Traffic Noise (CRTN), 1988, and DMRB HD 213/11.

Air Quality WebTAG Worksheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: INR - Inner Route Option 2D

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road/Rail or Road and Rail):	Road Transport (RT)

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):	#N/A
Present value of change in PM2.5 emissions (£):	#N/A
OR	
Present value of change in PM10 emissions (£):	#N/A

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):	#N/A
Of which:	
Concentration costs:	#N/A
Other impacts:	#N/A
Present value of change in PM2.5 concentrations (£):	#N/A
Of which:	
Concentration costs:	#N/A
Other impacts:	#N/A

Total Change

Total value of change in air quality (£):	#N/A

*positive value reflects a **net benefit** (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00
Change in PM2.5 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00

Damage Costs Approach (Emissions)

Change in NOX emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
Change in PM2.5 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
OR	
Change in PM10 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0

Qualitative Comments:

There are no designated Air Quality Management Area (AQMAs) within or adjacent to this option. The nearest AQMA is in Woodbridge.

There are 76 sensitive receptors identified 200m of the road alignment, predominantly in the A14, Claydon junction, north of Kesgrave in Playford Road and the junction of the A12/ A1214 east of Kesgrave and west of Martlesham. These include residential, schools, one hotel and a care home. The proposed road alignment will change air quality at these locations.

Two ecological receptors, Sinks Valley, Kesgrave, a Site of Special Scientific Interest, and Lux Wood, an Ancient Woodland, were identified within 200m of the Highway Route option.

Traffic flows will exceed the DMRB criteria for AADT, HDV, vehicle speeds along the road alignment, and near to the A14 junctions, South of Claydon, A12/A1214 junction east of Kesgrave and west of Martlesham.

No monitoring data is available along the road alignment. There are a number of Suffolk Coastal District Council (SCDC) monitoring sites at roadside locations approximately within 2.5km to the south and south east of the road alignment and the junction with the A12/A1214. In 2017, the maximum annual mean NO2 concentrations in this area was 35 µg/m3 at Kesgrave. Baseline conditions show that concentrations are likely to be below the annual mean NO2 objective.

A Defra PCM link was identified as the A1214, Main Road, which leads to the junction with the A12 and the Inner Route. The expected NO2 concentrations in this PCM link is 26.3µg/m3 in 2017.

Overall the Route Option, excluding impacts in the wider road network, is likely to create negative and positive changes in terms of local air quality and unlikely to be significant. Overall the potential impact is **Slight Adverse**.

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	#N/A
Lower estimate net present value of change in air quality (£):	#N/A

Data Sources:

Ambient UK Air Quality Interactive Map (https://uk-air.defra.gov.uk/data/gis-mapping)
The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) DMRB Guidance Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques. Part 1 HA 207/07 Air Quality
Department for Transport (2019) TAG UNIT A3 – Environmental Impact Appraisal.
Suffolk Costal and Waveney District Council (2018) 2018 Air Quality Annual Status Report (ASR).
Ipswich Borough Council (2018) 2018 Air Quality Annual Status Report (ASR).
Babergh and Mid Suffolk District Council (2018) 2018 Air Quality Annual Status Report (ASR).
https://uk-air.defra.gov.uk/data/pcm-data
https://magic.defra.gov.uk/

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: INR - Middle Route (Tie-in Options 2B and 2C)

Present Value Base Year	0
Current Year	2019
Proposal Opening year:	2027
Project (Road/Rail or Road and Rail):	Road Transport (RT)

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):	#DIV/0!
Present value of change in PM2.5 emissions (£):	#DIV/0!
OR	
Present value of change in PM10 emissions (£):	#DIV/0!

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):	#DIV/0!
Of which:	
Concentration costs:	#DIV/0!
Other impacts:	#DIV/0!
Present value of change in PM2.5 concentrations (£):	#DIV/0!
Of which:	
Concentration costs:	#DIV/0!
Other impacts:	#DIV/0!

Total Change

Total value of change in air quality (£):	#DIV/0!

*positive value reflects a **net benefit** (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00
Change in PM2.5 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00

Damage Costs Approach (Emissions)

Change in NOX emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
Change in PM2.5 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
OR	
Change in PM10 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0

Qualitative Comments:

There are no designated Air Quality Management Area (AQMAs) within or adjacent to the Middle Route. The nearest AQMA is in Woodbridge.

There are 234 sensitive receptors within 200m of the Middle Route (tie-in Option 2B), predominantly along in the A14, at the Claydon junction and the A12 Woodbridge. Other areas include Witnesham. These include residential buildings, two schools, two hotels and a care home. The high number of receptors is due to the proximity of residential buildings to the tie-in with the A12 Woodbridge.

There are 70 sensitive receptors within 200m of the Middle Route (tie-in Option 2C), predominantly along in the A14, at the Claydon junction and the A12 Woodbridge. Other areas include Witnesham. These include residential buildings, a school, two hotels and a care home; and

One ecological receptor, Blunts Wood, an Ancient Woodland, was identified within 200m of the Middle Route.

Traffic flows will exceed the DMRB criteria for AADT, HDV and vehicle speeds along the road alignment and the junctions with the A14, South of Claydon, and the A12, east of Woodbridge. Changes in traffic flows are likely to affect the AQMA in Woodbridge.

No monitoring data is available along the road alignment. The closest Suffolk Coastal District Council (SCDC) monitoring site at roadside locations is approximately 1.6km to the east of the A12 junction within the AQMA in Woodbridge. The maximum annual mean NO2 concentrations in 2017 in this area was 37µg/m3. Baseline conditions show that concentrations are likely to be below the annual mean NO2 objective.

No Defra PCM links were identified within this route.

Overall the Route Option, excluding impacts in the wider road network, are likely to create negative and positive changes in terms of local air quality and unlikely to be significant. Overall the potential impact is **Slight Adverse**.

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	#DIV/0!
Lower estimate net present value of change in air quality (£):	#DIV/0!

Data Sources:

Ambient UK Air Quality Interactive Map (https://uk-air.defra.gov.uk/data/gis-mapping)
The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) DMRB Guidance Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques. Part 1 HA 207/07 Air Quality
Department for Transport (2019) TAG UNIT A3 – Environmental Impact Appraisal.
Suffolk Costal and Waveney District Council (2018) 2018 Air Quality Annual Status Report (ASR).
Ipswich Borough Council (2018) 2018 Air Quality Annual Status Report (ASR).
Babergh and Mid Suffolk District Council (2018) 2018 Air Quality Annual Status Report (ASR).
https://uk-air.defra.gov.uk/data/pcm-data
https://magic.defra.gov.uk/

Air Quality Valuation Workbook - Worksheet 3

Scheme Name:	INR - Outer Route Option 1A
Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road/Rail or Road and Rail):	Road Transport (RT)

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):	#N/A
Present value of change in PM2.5 emissions (£):	#N/A
OR	
Present value of change in PM10 emissions (£):	#N/A

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):	#N/A
Of which:	
Concentration costs:	#N/A
Other impacts:	#N/A
Present value of change in PM2.5 concentrations (£):	#N/A
Of which:	
Concentration costs:	#N/A
Other impacts:	#N/A

Total Change

Total value of change in air quality (£):	#N/A

*positive value reflects a **net benefit** (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00
Change in PM2.5 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00

Damage Costs Approach (Emissions)

Change in NOX emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
Change in PM2.5 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0
OR	
Change in PM10 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0

Qualitative Comments:

There are no designated Air Quality Management Area (AQMAs) within or adjacent to the Outer Route Option. The nearest AQMA is in Woodbridge.

There are 147 sensitive receptors identified within 200m of the road alignment and the junctions with the A12 (Woodbridge). These include residential buildings and two hotels.

One ecological receptor, Borley Wood, an Ancient Woodland, was identified within 200m of the Highway Route option.

Traffic flows will exceed the DMRB criteria for AADT, HDV, vehicle speeds along the road alignment, and junctions with the A14 and the A12, north and east of Woodbridge. Changes in traffic flows, i.e. increases/decreases, are likely to affect the AQMA in Woodbridge, which includes an area encompassing a number of properties near to the junction of Lime Kiln Quay Road, Thoroughfare and St John's Street in Woodbridge.

No monitoring data is available along the road alignment. The closest Suffolk Costal District Council (SCDC) monitoring site is approximately 1.2km to the east of the A12 junction. The annual mean NO2 concentrations measured in 2017 in this area was 26µg/m3 at roadside locations. Baseline conditions show that concentrations are likely to be below the annual mean NO2 objective. No monitoring data is available along the road alignment.

No Defra PCM links were identified within this route.

Overall the Route Option, excluding impacts in the wider road network, is likely to create negative and positive changes in terms of local air quality and unlikely to be significant. Overall the potential impact is **Slight Adverse**.

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	#N/A
Lower estimate net present value of change in air quality (£):	#N/A

Data Sources:

Ambient UK Air Quality Interactive Map (https://uk-air.defra.gov.uk/data/gis-mapping)
The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) DMRB Guidance Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques. Part 1 HA 207/07 Air Quality
Department for Transport (2019) TAG UNIT A3 – Environmental Impact Appraisal.
Suffolk Costal and Waveney District Council (2018) 2018 Air Quality Annual Status Report (ASR).
Ipswich Borough Council (2018) 2018 Air Quality Annual Status Report (ASR).
Babergh and Mid Suffolk District Council (2018) 2018 Air Quality Annual Status Report (ASR).
https://uk-air.defra.gov.uk/data/pcm-data
https://magic.defra.gov.uk/

Greenhouse Gases WebTAG Worksheets

Greenhouse Gases Workbook - Worksheet 1

Scheme Name: INR - Inner Route Option 2D

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road/Rail or Road and Rail):	road

Overall Assessment Score:

Net Present Value of carbon dioxide equivalent emissions of proposal (£): #N/A

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Quantitative Assessment:

Change in carbon dioxide equivalent emissions over 60 year appraisal period (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Of which Traded 0

Change in carbon dioxide equivalent emissions in opening year (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Net Present Value of traded sector carbon dioxide equivalent emissions of proposal (£): #N/A
(N.B. this is not additional to the appraisal value in cell I17, as the cost of traded sector emissions is assumed to be internalised into market prices. See TAG Unit A3 for further details)

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Change in carbon dioxide equivalent emissions by carbon budget period:

	Carbon Budget 1	Carbon Budget 2	Carbon Budget 3	Carbon Budget 4
Traded sector	0	0	0	0
Non-traded sector	0	0	0	0

Qualitative Comments:

The UK Government is committed to reduce their national emissions of a range of pollutants as these can travel considerable distances and affect air quality across international boundaries. The Climate Change Act became UK Law on the 26th November 2008. This legislation introduced a new, more ambitious and legally binding target for the UK to reduce greenhouse gas (GHG) emissions to 80% below base year by 2050, with legally binding five year GHG budgets. The independent Committee on Climate Change (CCC) was set up to advise the UK Government on the setting and meeting of UK carbon budgets as well as monitoring progress against them scope and level of UK carbon budgets.

SCC has declared a Climate Emergency in March 2019 and is aiming to be a carbon neutral authority by 2030. SCC's Cabinet has agreed a paper to get policy agreed so all Council departments are required to consider carbon reduction in all their projects.

The Route Option intersects two local authorities: Babergh & Mid Suffolk District Councils and East Suffolk District Council. The total Greenhouse Gas emissions for these administrative areas in 2017 was 19,115ktCO2 for all sectors. Emissions associated with transport as a whole was estimated to be 7,201ktCO2 in 2017, with A roads accounting for 4,773ktCO2, minor roads 2,266ktCO2 and Diesel Railways / Transport Other 162ktCO2. None were provided in the dataset for motorways.

One of the objectives of the project is to optimise the environmental benefits of the Proposed Scheme and support low carbon development. Traffic modelling has been undertaken for this Route Option.

The construction of this Route Option would increase and decrease the traffic flow at some location along the proposed alignment and outside of the Study Area. As such, it is anticipated that greenhouse gas emissions will increase. In addition, it is anticipated that congestion would be reduced along existing routes, and overall journey lengths would be shorter. The reduction in stop-start traffic and queueing would have a beneficial impact on greenhouse gas emissions as vehicles are operating closer to optimum efficiency. Reducing journey lengths would have a further beneficial impact on greenhouse gas emissions as vehicles would be operating for a shorter period.

Overall, there is considered to be a Neutral impact on greenhouse gas emissions for this option given the potential increase / decrease in emissions.

Sensitivity Analysis:

Upper Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A
Lower Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A

Data Sources:

SCC (2019). Council Website. Council news. 'Working together to make Suffolk the greenest county in the land' Available at: https://www.suffolk.gov.uk/council-and-democracy/council-news/show/working-together-to-make-suffolk-the-greenest-county-in-the-land. Last accessed 29/08/2019

Greenhouse Gases Workbook - Worksheet 1

Scheme Name: INR - Middle Route (Tie-in Options 2B and 2C)

Present Value Base Year	2010
Current Year	2019
Proposal Opening year:	2027
Project (Road/Rail or Road and Rail):	road

Overall Assessment Score:

Net Present Value of carbon dioxide equivalent emissions of proposal (£): #N/A

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Quantitative Assessment:

Change in carbon dioxide equivalent emissions over 60 year appraisal period (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Of which Traded 0

Change in carbon dioxide equivalent emissions in opening year (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Net Present Value of traded sector carbon dioxide equivalent emissions of proposal (£): #N/A
(N.B. this is not additional to the appraisal value in cell I17, as the cost of traded sector emissions is assumed to be internalised into market prices. See TAG Unit A3 for further details)

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Change in carbon dioxide equivalent emissions by carbon budget period:

	Carbon Budget 1	Carbon Budget 2	Carbon Budget 3	Carbon Budget 4
Traded sector	0	0	0	0
Non-traded sector	0	0	0	0

Qualitative Comments:

The UK Government is committed to reduce their national emissions of a range of pollutants as these can travel considerable distances and affect air quality across international boundaries. The Climate Change Act became UK Law on the 26th November 2008. This legislation introduced a new, more ambitious and legally binding target for the UK to reduce greenhouse gas (GHG) emissions to 80% below base year by 2050, with legally binding five year GHG budgets. The independent Committee on Climate Change (CCC) was set up to advise the UK Government on the setting and meeting of UK carbon budgets as well as monitoring progress against them scope and level of UK carbon budgets.

SCC has declared a Climate Emergency in March 2019 and is aiming to be a carbon neutral authority by 2030. SCC's Cabinet has agreed a paper to get policy agreed so all Council departments are required to consider carbon reduction in all their projects.

The Route Option intersects two local authorities: Babergh & Mid Suffolk District Councils and East Suffolk District Council. The total Greenhouse Gas emissions for these administrative areas in 2017 was 19,115ktCO2 for all sectors. Emissions associated with transport as a whole was estimated to be 7,201ktCO2 in 2017, with A roads accounting for 4,773ktCO2, minor roads 2,266ktCO2 and Diesel Railways / Transport Other 162ktCO2. None were provided in the dataset for motorways.

One of the objectives of the project is to optimise the environmental benefits of the Proposed Scheme and support low carbon development. Traffic modelling has been undertaken for this Route Option.

The construction of the Route Option would increase and decrease the traffic flow at some location along the proposed alignment and outside of the Study Area. As such, it is anticipated that greenhouse gas emissions will increase. In addition, it is anticipated that congestion would be reduced along existing routes, and overall journey lengths would be shorter. The reduction in stop-start traffic and queueing would have a beneficial impact on greenhouse gas emissions as vehicles are operating closer to optimum efficiency. Reducing journey lengths would have a further beneficial impact on greenhouse gas emissions as vehicles would be operating for a shorter period.

Overall, there is considered to be a Neutral impact on greenhouse gas emissions for this option given the potential increase / decrease in emissions.

Sensitivity Analysis:

Upper Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A
Lower Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A

Data Sources:

SCC (2019). Council Website. Council news. 'Working together to make Suffolk the greenest county in the land' Available at: https://www.suffolk.gov.uk/council-and-democracy/council-news/show/working-together-to-make-suffolk-the-greenest-county-in-the-land. Last accessed 29/08/2019

Greenhouse Gases Workbook - Worksheet 1

Scheme Name: INR - Outer Route Option 1A

Present Value Base Year 2010

Current Year 2019

Proposal Opening year: 2027

Project (Road/Rail or Road and Rail): road

Overall Assessment Score:

Net Present Value of carbon dioxide equivalent emissions of proposal (£): #N/A

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Quantitative Assessment:

Change in carbon dioxide equivalent emissions over 60 year appraisal period (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Of which Traded 0

Change in carbon dioxide equivalent emissions in opening year (tonnes): 0
(between 'with scheme' and 'without scheme' scenarios)

Net Present Value of traded sector carbon dioxide equivalent emissions of proposal (£): #N/A
(N.B. this is not additional to the appraisal value in cell I17, as the cost of traded sector emissions is assumed to be internalised into market prices. See TAG Unit A3 for further details)

*positive value reflects a **net benefit** (i.e. CO2E emissions reduction)

Change in carbon dioxide equivalent emissions by carbon budget period:

	Carbon Budget 1	Carbon Budget 2	Carbon Budget 3	Carbon Budget 4
Traded sector	0	0	0	0
Non-traded sector	0	0	0	0

Qualitative Comments:

The UK Government is committed to reduce their national emissions of a range of pollutants as these can travel considerable distances and affect air quality across international boundaries. The Climate Change Act became UK Law on the 26th November 2008. This legislation introduced a new, more ambitious and legally binding target for the UK to reduce greenhouse gas (GHG) emissions to 80% below base year by 2050, with legally binding five year GHG budgets. The independent Committee on Climate Change (CCC) was set up to advise the UK Government on the setting and meeting of UK carbon budgets as well as monitoring progress against them scope and level of UK carbon budgets.

SCC has declared a Climate Emergency in March 2019 and is aiming to be a carbon neutral authority by 2030. SCC's Cabinet has agreed a paper to get policy agreed so all Council departments are required to consider carbon reduction in all their projects.

The Route Option intersects two local authorities: Babergh & Mid Suffolk District Councils and East Suffolk District Council. The total Greenhouse Gas emissions for these administrative areas in 2017 was 19,115ktCO2 for all sectors. Emissions associated with transport as a whole was estimated to be 7,201ktCO2 in 2017, with A roads accounting for 4,773ktCO2, minor roads 2,266ktCO2 and Diesel Railways / Transport Other 162ktCO2. None were provided in the dataset for motorways.

One of the objectives of the project is to optimise the environmental benefits of the Proposed Scheme and support low carbon development. Traffic modelling has been undertaken for this Route Option.

The Route Option would increase and decrease the traffic flow at some location along the proposed alignment and outside of the Study Area. As such, it is anticipated that greenhouse gas emissions will increase. In addition, it is anticipated that congestion would be reduced along existing routes, and overall journey lengths would be shorter. The reduction in stop-start traffic and queueing would have a beneficial impact on greenhouse gas emissions as vehicles are operating closer to optimum efficiency. Reducing journey lengths would have a further beneficial impact on greenhouse gas emissions as vehicles would be operating for a shorter period.

Overall, there is considered to be a Neutral impact on greenhouse gas emissions for this option given the potential increase / decrease in emissions.

Sensitivity Analysis:

Upper Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A
Lower Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):	#N/A

Data Sources:

SCC (2019). Council Website. Council news. 'Working together to make Suffolk the greenest county in the land' Available at: https://www.suffolk.gov.uk/council-and-democracy/council-news/show/working-together-to-make-suffolk-the-greenest-county-in-the-land. Last accessed 29/08/2019

Landscape WebTAG Worksheets

TAG Landscape Impacts Worksheet - Inner Route 2D

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	Landscape pattern of this Route Option is characterised by a patchwork of small to medium agricultural fields and pockets of woodland within a gentle unenclosed topography, there are urban areas bordering the Route Option to the south. The South Norfolk & High Suffolk Claylands are characterised by a relatively flat topography, incised by stream and river valley corridors. Views are frequently open, only sometimes confined by hedges and trees, with some woodland present. The small valleys support quite confined landscapes with intimate views. There are also scattered areas of ancient woodland, game copses, shelterbelts, valley floor plantation and carr woodland as well as hedgerow trees provide a treed landscape character, despite much boundary loss. Settlements include Wymondham, Diss, Framlingham and Wickham Market. The Suffolk Coast and Heaths stretch along the North Sea coast between Great Yarmouth in the north and the port town of Harwich in the south, forming a long, narrow band that extends between 10 and 20km inland. The area is characterised by flat and gently rolling countryside, often open but with few commanding viewpoints. Settlements include Ipswich, Lowestoft and Felixstowe. In many places, and especially near the coast, wildlife habitats and landscape features lie in an intimate mosaic, providing great diversity in a small area. Approximately 45% of the area is designated as the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) which runs to the east of the study area and is approximately 500m to the east of the Route Option. The South Suffolk and North Essex Clayland is an ancient landscape of wooded arable countryside with a distinct sense of enclosure. The overall character is of gently undulating, chalky boulder clay plateau, the undulations being caused by the numerous small-scale river valleys that dissect the plateau. There is a complex network of old species-rich hedgerows, ancient woods and parklands, meadows with streams and rivers that flow eastwards. A number of Local Character Areas are crossed by the Inner Route Option. N2 Culpho and Westerfield Rolling Farmland is a landscape defined entirely by the Ancient Rolling Farmland type. Special qualities and features of this LCA include the rural setting to the northern edge of Ipswich; the setting to a number of villages; very distinctive oak trees along lanes; small area of parkland associated with Grundisburgh Hall; and ancient woodland at Culpo and Lux Woods. The field boundary hedges that are left are in moderate condition but are somewhat dynamic owing to the high proportion of regenerating elm. Oak trees are characteristic boundary features. The predominant visual experience is one of openness, but roads and lanes are often hedged providing intimacy and contrast to the lengthy views otherwise experienced. The strategy objectives set out for this LCA include the protection of 'the network of hedges and trees… and seek opportunities to link and strengthen the network'; the protection of 'the quiet, rural character of the lanes'; and the protection of 'the plateau landscape from visual intrusion of development in areas beyond this character area'. B8 Fynn Valley is an area of almost entirely Rolling Valley Farmlands and Furze, with a small area of Valley Meadowlands. The LCA description mentions that 'this is a vulnerable landscape under considerable development pressure because of the good connections and proximity to Ipswich and Woodbridge'. Special qualities and features of this LCA include the presence of Fynn Valley Long distance footpath, supported by a dense network of further footpaths; and 'the countryside comes right through the villages along the floodplains, offering opportunities for long and attractive views of tree fringed meadows and providing an attractive setting for the villages'. The meadowlands have generally changed little over the centuries and most continue being managed for grazing and hay making. There is some inappropriate planting of conifer. The strategy objectives set out for this LCA include protection of the settlement patterns of the villages along the valley side; protection of the Ramsar wetlands and SPA habitats for wild birds at Martlesham Creek; protection of the fine grained enclosure patterns and drainage ditch networks; and provide sympathetic management for ecological benefits. K5 Kesgrave Sandlands, the whole of which is within the Estate Sandlands type of the Suffolk Landscape Character Assessment. Special qualities and features of this LCA include: the branches of the long distance 'Sandlings Walk' footpaths; the remnant heaths and mixed deciduous woodland, heathland and golf courses; and its modern land cover, geometric patterns and extensive and regular pattern of tree cover. Condition of the landscape in the centre and west of the character area is under pressure for development and very little semi-natural habitat remains. The heathland remnants are subject to variable management. The strategy objectives set out for this LCA include the protection of the remaining semi-natural features and habitats from loss or harm due to development and the protection of heathlands from any reduction in area. SSP38 - Special Landscape Area is an area identified in District Council Planning Policy and has been designated locally because of its landscape sensitivity and scenic quality. The Middle Route intersects SSP38. Suffolk Coastal Local Plan: Saved Policies (2013) states the following for Saved Policy no. AP13 ('Special Landscape Areas') 'The District Council will ensure that no development will take place which would be to the material detriment of, or materially detract from, the special landscape quality'.	The landscape pattern matters on a national scale.	Regionally common landscape pattern.	Medium importance at the regional level.	Local landscape pattern could be replicated over time and therefore has a relatively high level of substitutability.	**Moderate Adverse** effect on the landscape pattern, particularly in relation to views as new stretches of road are created on undeveloped land. The Inner Route Option may also affect the objectives set out within the LCAs it crosses. Even with mitigation the Inner Route Option would be at odds with the local pattern and landform, and will reduce visual amenity.
Tranquillity	There are low levels of tranquillity along existing transport infrastructure, mainly the A14 on the west of the Inner Route Option and the A12 to the east due to vehicle noise, movements and artificial lighting. There is moderate to high levels of tranquillity throughout the middle sections of the Inner Route Option where existing transport infrastructure is further away. These areas are largely rural in surroundings with limited settlements and a small network of local roads.	The landscape tranquillity matters on a regional scale.	Regionally common levels of tranquillity.	Medium importance at the national, regional and local level.	Tranquillity could be replicated over time and therefore is substitutable.	**Moderate Adverse** effect on tranquillity of the landscape, as the Inner Route Option would cause an increase in visual and audible intrusion in areas along the route that are currently of moderate to high tranquillity.
Cultural	The South Norfolk and High Suffolk Claylands contain many visible archaeological remains. Iron-age and Roman settlement was extensive and grew again in the Saxon period. Round-towered Saxo-Norman churches of flint construction are a particular feature of the northern part of the area. The large market towns retain high proportions of 15th to 17th century buildings. There is a high survival of moated houses and these are generally associated with high-status sites and 13th to 14th century date. The Suffolk Coasts and Heaths contains a wealth of monuments, listed buildings and registered parks and gardens. The Ridgeway trail is considered one of the oldest routeways in Britain, and links several emblematic sites. Many monuments and modified landforms are prominent on the skyline. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century. The South Suffolk and North Essex Clayland is mainly an anciently-enclosed landscape of mixed farming practises, with a pattern of small isolated farms and farming hamlets around greens and commons which retain a rich legacy of historic barns and other farm buildings. The area also has some of the finest medieval churches in East Anglia, many of them funded by the lucrative wool trade, as at Lavenham and Long Melford.	The cultural associations of the landscape matter on a regional scale due to the wealth of heritage in the surrounding area. Within the South Norfolk and High Suffolk Claylands NCA there are the following designated historic assets, 11 registered park and gardens, 130 scheduled monuments and 7,030 listed buildings. Within the Suffolk Coast and Heaths NCA there are the following designated historic assets, 10 registered parks and gardens, 111 scheduled monuments and 2,280 listed buildings. Within the South Suffolk and North Essex Clayland NCA there are the following designated historic assets, 44 registered parks and gardens, 330 scheduled monuments and 17,233 listed buildings.	Regionally common cultural associations present within the landscape.	High importance at regional and local levels.	Cultural associations can not be replicated over time and therefore are not substitutable.	**Moderate Adverse** impact on cultural associations as the Outer Route Option would introduce urbanising elements into the landscape which would alter existing visual amenity and perception of cultural associations.
Landcover	Rural landscape with mixed arable / pastoral farming. Fields bounded by hedgerows / hedgerow trees, which form an interlocking matrix across the landscape. Settlement pattern includes both nucleated settlements and scattered farmsteads / properties along minor narrow roads. Regular woodland blocks present within landscape which reinforce generally regular pattern of fields. Dispersed settlements and farmsteads across the surrounding landscape. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century.	The landcover within the landscape matters on a local to regional scale.	Regionally common landcover.	Medium importance at the national and regional level, and high importance at the local level	Local landcover pattern could be replicated over time and therefore have a relatively high level of substitutability.	**Moderate Adverse** (negative) impact on the landcover as the Inner Route Option would reduce visual amenity through the introduction of urbanising elements into the landscape and removal of landscape features (such as hedgerows / woodland / agricultural fields).
Summary of character	The Inner Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Inner Route Option crosses three Local Character Areas N2 Cupho, Westerfield Rolling Farmland, B8 Fynn Valley and Kesgrave Sandlands as well as SSP38 - Special Landscape Area. Between these NCAs, the Inner Route Option lies within widely varying local landscape character types, including lowland agricultural areas and semi-urban areas. The eastern edge of the Inner Route Option is within approximately 500m of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain. The Inner Route Option is within close proximity to cultural heritage designations including scheduled monuments, registered parks and gardens and numerous listed buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to semi-urban areas in the east and west.	The landscape matters on a local to national scale.	Regionally common landscape character.	High importance at the national, regional level and local level	Local landscape pattern / landcover could be replicated over time and therefore have a relatively high level of substitutability. However, cultural associations of the landscape are not able to be replaced.	**Moderate Adverse** impact on landscape character as the Inner Route Option would change the pattern / landcover and introduce urbanising elements into the landscape. This would slightly reduce the landscape setting of heritage assets including listed buildings and adversely affect visual

Reference Sources

Natural England (2014) National Character Area Profile 83: South Norfolk and High Suffolk Claylands
Natural England (2015) National Character Area Profile 82: Suffolk Coast and Heaths

Step 5 - Summary Assessment Score

Moderate Adverse

Qualitative Comments

The Inner Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Inner Route Option crosses three Local Character Areas N2 Cupho, Westerfield Rolling Farmland, B8 Fynn Valley and Kesgrave Sandlands as well as SSP38 - Special Landscape Area. Between these NCAs, the Inner Route Option lies within widely varying local landscape character types, including lowland agricultural areas and semi-urban areas.

TAG Landscape Impacts Worksheet - Middle Route (Tie-in Options 2B and 2C)

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	Landscape pattern of this Route Option is characterised by a patchwork of small to medium agricultural fields and pockets of woodland within a gentle unenclosed topography. The South Norfolk & High Suffolk Claylands are characterised by a relatively flat topography, incised by stream and river valley corridors. Views are frequently open, only sometimes confined by hedges and trees, with some woodland present. The small valleys support quite confined landscapes with intimate views. There are also scattered areas of ancient woodland, game copses, shelterbelts, valley floor plantation and carr woodland as well as hedgerow trees provide a treed landscape character, despite much boundary loss. Settlements include Wymondham, Diss, Framlingham and Wickham Market. The Suffolk Coast and Heaths stretch along the North Sea coast between Great Yarmouth in the north and the port town of Harwich in the south, forming a long, narrow band that extends between 10km and 20km inland. The area is characterised by flat and gently rolling countryside, often open but with few commanding viewpoints. Settlements include Ipswich, Lowestoft and Felixstowe. In many places, and especially near the coast, wildlife habitats and landscape features lie in an intimate mosaic, providing great diversity in a small area. Approximately 45% of the area is designated as the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) which runs to the east of the study area and is approximately 2km to the east of the Route Option. The South Suffolk and North Essex Clayland is an ancient landscape of wooded arable countryside with a distinct sense of enclosure. The overall character is of gently undulating, chalky boulder clay plateau, the undulations being caused by the numerous small-scale river valleys that dissect the plateau. There is a complex network of old species-rich hedgerows, ancient woods and parklands, meadows with streams and rivers that flow eastwards. A number of Local Character Areas are crossed by the Middle Route Option. N2 Culpho and Westerfield Rolling Farmland is a landscape defined entirely by the Ancient Rolling Farmland type. Special qualities and features of this LCA include the rural setting to the northern edge of Ipswich; the setting to a number of villages; very distinctive oak trees along lanes; small area of parkland associated with Grundisburgh Hall; and ancient woodland at Culpo and Lux Woods. The field boundary hedges that are left are in moderate condition but are somewhat dynamic owing to the high proportion of regenerating elm. Oak trees are characteristic boundary features. The predominant visual experience is one of openness, but roads and lanes are often hedged providing intimacy and contrast to the lengthy views otherwise experienced. The strategy objectives set out for this LCA include the protection of 'the network of hedges and trees… and seek opportunities to link and strengthen the network'; the protection of 'the quiet, rural character of the lanes'; and the protection of 'the plateau landscape from visual intrusion of development in areas beyond this character area'. B8 Fynn Valley is an area of almost entirely Rolling Valley Farmlands and Furze, with a small area of Valley Meadowlands. The LCA description mentions that 'this is a vulnerable landscape under considerable development pressure because of the good connections and proximity to Ipswich and Woodbridge'. Special qualities and features of this LCA include the presence of Fynn Valley Long distance footpath, supported by a dense network of further footpaths; and 'the countryside comes right through the villages along the floodplains, offering opportunities for long and attractive views of tree fringed meadows and providing an attractive setting for the villages'. The meadowlands have generally changed little over the centuries and most continue being managed for grazing and hay making. There is some inappropriate planting of conifer. The strategy objectives set out for this LCA include protection of the settlement patterns of the villages along the valley side; protection of the Ramsar wetlands and SPA habitats for wild birds at Martlesham Creek; protection of the fine grained enclosure patterns and drainage ditch networks; and provide sympathetic management for ecological benefits. SSP38 - Special Landscape Area is an area identified in District Council Planning Policy and has been designated locally because of its landscape sensitivity and scenic quality. The Middle Route intersects SSP38. Suffolk Coastal Local Plan: Saved Policies (2013) states the following for Saved Policy no. AP13 ('Special Landscape Areas') 'The District Council will ensure that no development will take place which would be to the material detriment of, or materially detract from, the special landscape quality'.	The landscape pattern matters on a regional scale.	Regionally common landscape pattern.	Medium importance at the regional level.	Local landscape pattern could be replicated over time and therefore has a relatively high level of substitutability.	**Moderate Adverse** effect on the landscape pattern, particularly in relation to views as new stretches of road are created on undeveloped land. The Middle Route Option may also affect the objectives set out within the LCAs in crosses. Even with mitigation the Middle Route Option would be at odds with the local pattern and landform, and will reduce visual amenity.
Tranquillity	There are low levels of tranquillity along existing transport infrastructure, mainly the A14 on the west of the Inner Route Option and the A12 to the east due to vehicle noise, movements and artificial lighting. There are high levels of tranquillity throughout the middle sections of the Middle Route Option where the surroundings are rural with limited settlements and a small network of local roads.	The landscape tranquillity matters on a regional scale.	Regionally common levels of tranquillity.	Medium importance at the national, regional and local level.	Tranquillity could not be replicated and is therefore not substitutable.	**Moderate Adverse** effect on tranquillity of the landscape, as the Middle Route Option would cause a large increase in visual and audible intrusion in areas along the route that are currently of high tranquillity.
Cultural	The South Norfolk and High Suffolk Claylands contain many visible archaeological remains. Iron-age and Roman settlement was extensive and grew again in the Saxon period. Round-towered Saxo-Norman churches of flint construction are a particular feature of the northern part of the area. The large market towns retain high proportions of 15th to 17th century buildings. There is a high survival of moated houses and these are generally associated with high-status sites and 13th to 14th century date. The Suffolk Coasts and Heaths contains a wealth of monuments, listed buildings and registered parks and gardens. The Ridgeway trail is considered one of the oldest routeways in Britain, and links several emblematic sites. Many monuments and modified landforms are prominent on the skyline. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century. The South Suffolk and North Essex Clayland is mainly an anciently-enclosed landscape of mixed farming practises, with a pattern of small isolated farms and farming hamlets around greens and commons which retain a rich legacy of historic barns and other farm buildings. The area also has some of the finest medieval churches in East Anglia, many of them funded by the lucrative wool trade, as at Lavenham and Long Melford.	The cultural associations of the landscape matter on a regional scale due to the wealth of heritage in the surrounding area. Within the South Norfolk and High Suffolk Claylands NCA there are the following designated historic assets, 11 registered park and gardens, 130 scheduled monuments and 7,030 listed buildings. Within the Suffolk Coast and Heaths NCA there are the following designated historic assets, 10 registered parks and gardens, 111 scheduled monuments and 2,280 listed buildings. Within the South Suffolk and North Essex Clayland NCA there are the following designated historic assets, 44 registered parks and gardens, 330 scheduled monuments and 17,233 listed buildings.	Regionally common cultural associations present within the landscape.	High importance at regional and local levels.	Cultural associations can not be replicated over time and therefore are not substitutable.	**Moderate Adverse** impact on cultural associations as the Outer Route Option would introduce urbanising elements into the landscape which would alter existing visual amenity and perception of cultural associations.
Landcover	Rural landscape with mixed arable / pastoral farming. Fields bounded by hedgerows / hedgerow trees, which form an interlocking matrix across the landscape. Settlement pattern includes both nucleated settlements and scattered farmsteads / properties along minor narrow roads. The landcover is largely agricultural fields divided by borders of hedgerows and pockets of woodland. There are also a number of dispersed settlements and farmsteads across the surrounding landscape. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century.	The landcover within the landscape matters on a local to regional scale.	Regionally common landcover.	Medium importance at the national and regional level, and high importance at the local level	Local landcover pattern could be replicated over time and therefore have a relatively high level of substitutability.	**Moderate Adverse** (negative) impact on the landcover as the Middle Route Option would reduce visual amenity through the introduction of urbanising elements into the landscape and removal of landscape features (such as hedgerows / woodland / agricultural fields).
Summary of character	The Middle Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Outer Route Option crosses three Local Character Areas N2 Cupho and B8 Fynn Valley as well as SSP38 - Special Landscape Area. Between these NCAs, the Inner Route Option lies within widely varying local landscape character types, including lowland agricultural areas and semi-urban areas. The eastern edge of the Middle Route Option is within approximately 2km of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain. The Middle Route Option is within close proximity to cultural heritage designations including scheduled monuments, registered parks and gardens and numerous listed buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to semi-urban areas in the east and west.	The landscape matters on a local to national scale.	Regionally common landscape character.	High importance at the national, regional level and local level	Local landscape pattern / landcover could be replicated over time and therefore have a relatively high level of substitutability. However, cultural associations of the landscape are not able to be replaced.	**Moderate Adverse** impact on landscape character as the Middle Route Option would change the pattern / landcover and introduce urbanising elements into the landscape. This would reduce the landscape setting of heritage assets including listed buildings and adversely affect visual amenity of surrounding receptors including residential areas and public right of way (PRoW). Mitigation could be implemented to reduce impacts.

Reference Sources

Natural England (2014) National Character Area Profile 83: South Norfolk and High Suffolk Claylands
Natural England (2015) National Character Area Profile 82: Suffolk Coast and Heaths
Natural England (2014) National Character Area Profile 86: South Suffolk and North Essex Clayland

Step 5 - Summary Assessment Score

Moderate Adverse

Qualitative Comments

The Middle Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Inner Route Option crosses three Local Character Areas N2 Cupho and B8 Fynn Valley as well as SSP38 - Special Landscape Area. Between these NCAs, the Inner Route Option lies within widely varying local landscape character types, including lowland agricultural areas and semi-urban areas.
The eastern edge of the Middle Route Option is within approximately 2km of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain.
The Middle Route Option is within close proximity to cultural heritage designations including scheduled monuments, registered parks and gardens and numerous listed buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to semi-urban areas in the east and west.

Overall, the route option will have moderate adverse effects on the landscape pattern, tranquillity of the landscape, cultural associations, landcover and landscape character.

TAG Landscape Impacts Worksheet - Outer Route Option 1A

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	Landscape pattern of this Route Option is characterised by a patchwork of small to medium agricultural fields and pockets of woodland within a gentle unenclosed topography. The South Norfolk & High Suffolk Claylands are characterised by a relatively flat topography, incised by stream and river valley corridors. Views are frequently open, only sometimes confined by hedges and trees, with some woodland present. The small valleys support quite confined landscapes with intimate views. There are also scattered areas of ancient woodland, game copses, shelterbelts, valley floor plantation and carr woodland as well as hedgerow trees provide a treed landscape character, despite much boundary loss. Settlements include Wymondham, Diss, Framlingham and Wickham Market. The Suffolk Coast and Heaths stretch along the North Sea coast between Great Yarmouth in the north and the port town of Harwich in the south, forming a long, narrow band that extends between 10 and 20km inland. The area is characterised by flat and gently rolling countryside, often open but with few commanding viewpoints. Settlements include Ipswich, Lowestoft and Felixstowe. In many places, and especially near the coast, wildlife habitats and landscape features lie in an intimate mosaic, providing great diversity in a small area. Approximately 45% of the area is designated as the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) which runs to the east of the study area and is approximately 500m to the east of the Route Option. A number of Local Character Areas are crossed by the Outer Route Option. N1 Boulge Park and Bredfield Rolling Farmland is defined by the Ancient Rolling Farmlands type. Special qualities and features of this LCA include Boulge Park (which is listed as Park and Gardens of Historic Interest); three Ancient Woodlands; and Wickham Market, which has a wealth of medieval architecture and Victorian heritage. The woodland and tree stock is in good condition and is well managed in many parts of the area. The strategy objectives set out for this LCA aim at protecting the 'undeveloped rural character of the area', the 'quiet, rural character of the narrow lanes', and the 'plateau landscape from visual intrusion of development in areas beyond this character area'. L4 Otley Hall and Debach Estate Claylands is entirely within the Ancient Estate Claylands landscape type. Special qualities and features of this LCA include 'sense of remoteness and ruralness is strong and unspoilt by 20th century development'. This landscape appears to be generally in good condition with dense continuous hedges in most places. Two of the strategy objectives set out for this LCA are to 'protect the sense of ruralness and remoteness' and 'Protect the network of small pastures and the hedgerows that enclose them'. B9 Lark Valley is simply defined by the Rolling Valley Claylands type. Special qualities and features of this LCA include Grundisburgh and Burgh, and the intervening water meadows which form a Conservation Area. This scenic small valley offers a variety of visual experiences focused around the narrow network of water meadows, and overlooked by traditional buildings which mark the distinctive rolling passage along the valley. Condition of this LCA is in generally good although floodplain hedges not always well managed and equestrianism erodes some of the meadows. The strategy objectives set out for this LCA include the protection of the edges of Grundisburgh from development; the protection of the pattern of scattered woodlands and rural holdings; the protection of Newbourne Springs intimate woodland character; and the protection of the fine grained enclosure patterns and drainage ditch networks. The South Suffolk and North Essex Clayland is an ancient landscape of wooded arable countryside with a distinct sense of enclosure. The overall character is of gently undulating, chalky boulder clay plateau, the undulations being caused by the numerous small-scale river valleys that dissect the plateau. There is a complex network of old species-rich hedgerows, ancient woods and parklands, meadows with streams and rivers that flow eastwards. SSP38 - Special Landscape Area is an area identified in District Council Planning Policy and has been designated locally because of its landscape sensitivity and scenic quality. The Middle Route intersects the northern edge of SSP38. Suffolk Coastal Local Plan: Saved Policies (2013) states the following for Saved Policy no. AP13 ('Special Landscape Areas') 'The District Council will ensure that no development will take place which would be to the material detriment of, or materially detract from, the special landscape quality'.	The landscape pattern matters on a regional scale.	Regionally common landscape pattern.	Medium importance at the regional level.	Local landscape pattern could be replicated over time and therefore has a relatively high level of substitutability.	**Moderate Adverse** effect on the landscape pattern, particularly in relation to views as new stretches of road are created on undeveloped land. The Outer Route Option may also affect the objectives set out within the LCAs in crosses. Even with mitigation the Outer Route Option would be at odds with the local pattern and landform, and will reduce visual amenity.
Tranquillity	There are low levels of tranquility along existing transport infrastructure, mainly the A14 on the west of the Inner Route Option and the A12 to the east due to vehicle noise, movements and artificial lighting. There are high levels of tranquility throughout the middle sections of the Outer Route Option where the surroundings are rural with limited settlements and a small network of local roads.	The landscape tranquility matters on a regional scale.	Regionally common levels of tranquility.	Medium importance at the national, regional and local level.	Tranquillity not be replicated and is therefore not substitutable.	**Moderate Adverse** effect on tranquillity of the landscape, as the Outer Route Option would cause a large increase in visual and audible intrusion in areas along the route that are currently of high tranquillity.
Cultural	The South Norfolk and High Suffolk Claylands contain many visible archaeological remains. Iron-age and Roman settlement was extensive and grew again in the Saxon period. Round-towered Saxo-Norman churches of flint construction are a particular feature of the northern part of the area. The large market towns retain high proportions of 15th to 17th century buildings. There is a high survival of moated houses and these are generally associated with high-status sites and 13th to 14th century date. The Suffolk Coasts and Heaths contains a wealth of monuments, listed buildings and registered parks and gardens. The Ridgeway trail is considered one of the oldest routeways in Britain, and links several emblematic sites. Many monuments and modified landforms are prominent on the skyline. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century. The South Suffolk and North Essex Clayland is mainly an anciently-enclosed landscape of mixed farming practises, with a pattern of small isolated farms and farming hamlets around greens and commons which retain a rich legacy of historic barns and other farm buildings. The area also has some of the finest medieval churches in East Anglia, many of them funded by the lucrative wool trade, as at Lavenha and Long Melford.	The cultural associations of the landscape matter on a regional scale due to the wealth of heritage in the surrounding area. Within the South Norfolk and High Suffolk Claylands NCA there are the following designated historic assets, 11 registered park and gardens, 130 scheduled monuments and 7,030 listed buildings. Within the Suffolk Coast and Heaths NCA there are the following designated historic assets, 10 registered parks and gardens, 111 scheduled monuments and 2,280 listed buildings. Within the South Suffolk and North Essex Clayland NCA there are the following designated historic assets, 44 registered parks and gardens, 330 scheduled monuments and 17,233 listed buildings.	Regionally common cultural associations present within the landscape.	High importance at regional and local levels.	Cultural associations can not be replicated over time and therefore are not substitutable.	**Moderate Adverse** impact on cultural associations as the Outer Route Option would introduce urbanising elements into the landscape which would alter existing visual amenity and perception of cultural associations.
Landcover	Rural landscape with mixed arable / pastoral farming. Fields bounded by hedgerows / hedgerow trees, which form an interlocking matrix across the landscape. Settlement pattern includes both nucleated settlements and scattered farmsteads / properties along minor narrow roads. The lands cover is largely agricultural fields divided by borders of hedgerows and pockets of woodland. There are also a number of dispersed settlements and farmsteads across the surrounding landscape. Fieldscapes and farmsteads of the area provide a sense of continuity of farming. Field patterns include examples of enclosure from between the 16th and 18th century.	The landcover within the landscape matters on a local to regional scale.	Regionally common landcover.	Medium importance at the national and regional level, and high importance at the local level	Local landcover pattern could be replicated over time and therefore have a relatively high level of substitutability.	**Moderate Adverse** impact on the landcover as the Outer Route Option would reduce visual amenity through the introduction of urbanising elements into the landscape and removal of landscape features (such as hedgerows / woodland / agricultural fields).
Summary of character	The Outer Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Outer Route Option crosses three Local Character Areas N1 Boulge Park and Bredfield Rolling Farmland, Otley Hall and Debach Estate Claylands and Lark Valley as well as SSP38 - Special Landscape Area. Between these NCAs, the Inner Route Option lies within widely varying local landscape character types, including lowland agricultural areas and semi-urban areas. The eastern edge of the Outer Route Option is within approximately 2km of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain. The Outer Route Option is within close proximity to cultural heritage designations including scheduled monuments, registered parks and gardens and numerous listed buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to semi-urban areas in the east and west.	The landscape matters on a local to national scale.	Regionally common landscape character.	High importance at the national, regional level and local level	Local landscape pattern / landcover could be replicated over time and therefore have a relatively high level of substitutability. However, cultural associations of the landscape are not able to be replaced.	**Moderate Adverse** impact on landscape character as the Outer Route Option would change the pattern / landcover and introduce urbanising elements into the landscape. This would reduce the landscape setting of heritage assets including Shrubland Hall and listed buildings and adversely affect visual amenity of surrounding receptors including residential areas and public right of way (PRoW). Mitigation could be implemented to reduce impacts.

Reference Sources

Natural England (2014) National Character Area Profile 83: South Norfolk and High Suffolk Claylands
Natural England (2015) National Character Area Profile 82: Suffolk Coast and Heaths
Natural England (2014) National Character Area Profile 86: South Suffolk and North Essex Clayland

Step 5 - Summary Assessment Score

Moderate Adverse

Qualitative Comments

The Outer Route Option lies within the Suffolk Coast & Heaths, the South Norfolk and High Suffolk Claylands and the South Suffolk and North Essex Clayland National Character Areas. In addition the Outer Route Option crosses three Local Character Areas N1 Boulge Park and Bredfield Rolling Farmland, Otley Hall as well as Debach Estate Claylands and Lark Valley and SSP38 - Special Landscape Area. Between these NCAs, the Outer Route Option lies within widely varying local landscape character types, including lowland agricultural areas and small villages.
The eastern edge of the Outer Route Option is within approximately 2km of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) a low-lying coastal landscape of astonishing variety including shingle beaches, crumbling cliffs, marshes, estuaries, heathland, forests and farmland. The landscape is of particular regional and national importance given its distinctive Suffolk character and status as one of the most important wildlife areas in Britain.
The Outer Route Option is within close proximity to cultural heritage designations including scheduled monuments, registered parks and gardens and numerous listed buildings. Settlement patterns vary widely, from rural agricultural land and scattered farmsteads to semi-urban areas in the east and west.

Overall, the route option will have moderate adverse effects on the landscape pattern, tranquillity of the landscape, cultural associations, landcover and landscape character.

Historic Environment WebTAG Worksheets

TAG Historic Environment Impacts Worksheet - Inner Route Option 2D

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	**Designated heritage assets (physically affected by the scheme)** 1. None. **Designated heritage assets (possible setting impact)** 2. Three Grade II* listed buildings. 3. 21 Grade II listed buildings. 4. Three Scheduled Monuments.	1. N/A. 2-3. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 4. The protection of Scheduled Monuments is a national concern	1.N./A. 2. The Grade II* Listed Buildings are of High significance. 3. The Grade II Listed Buildings are of Medium significance. 4. Scheduled Monuments are of High significance.	1. N/A. 2. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 3. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 4. Scheduled Monuments are of national importance.	There would be a **Moderate adverse** impact to form due to the impact on the setting of Designated heritage assets.
Survival	1. N/A. 2-3. The listed buildings will have high level of survival. 4. The level of survival of the Scheduled Monuments is unknown.	1. N/A. 2-3. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 4. The protection of Scheduled Monuments is a national concern	1.N./A. 2. The Grade II* Listed Buildings are of High significance. 3. The Grade II Listed Buildings are of Medium significance. 4. Scheduled Monuments are of High significance.	1. N/A. 2. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 3. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 4. Scheduled Monuments are of national importance.	There would be a **Moderate adverse** impact to survival due to the impact on the setting of Designated heritage assets.
Condition	1. N/A. 2-3. The condition of the listed buildings is unknown. 4. The condition of the Scheduled Monuments is unknown.	1. N/A. 2-3. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 4. The protection of Scheduled Monuments is a national concern	1.N./A. 2. The Grade II* Listed Buildings are of High significance. 3. The Grade II Listed Buildings are of Medium significance. 4. Scheduled Monuments are of High significance.	1. N/A. 2. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 3. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 4. Scheduled Monuments are of national importance.	There would be a **Moderate adverse** impact to condition due to the impact on the setting of Designated heritage assets.
Complexity	1. N/A. 2-3. The complexity of the listed buildings is unknown. 4. The complexity of the Scheduled Monuments is unknown.	1. N/A. 2-3. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 4. The protection of Scheduled Monuments is a national concern	1.N./A. 2. The Grade II* Listed Buildings are of High significance. 3. The Grade II Listed Buildings are of Medium significance. 4. Scheduled Monuments are of High significance.	1. N/A. 2. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 3. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 4. Scheduled Monuments are of national importance.	There would be a **Moderate adverse** impact to complexity due to the impact on the setting of Designated heritage assets.
Context	1. N/A. 2. Rural. 3. Rural. 4. Rural.	The context is not impacted.	The context is not impacted.	The context is not impacted.	**Neutral impact**
Period	1. N/A. 2. Medieval/Post-medieval. 3. Post-medieval. 4. Prehistoric.	The period is not impacted.	The period is not impacted.	The period is not impacted.	**Neutral impact**

Reference Sources

National Heritage List for England.
The Suffolk Historic Environment Record of non-designated heritage assets was not consulted, therefore the appraisal has not included a review of buried archaeological assets and undesignated heritage assets. However, it should be noted that below ground remains are likely on all three route options.
Note: A site walkover was not undertaken.

Step 5 - Summary Assessment Score

Moderate adverse

Qualitative Comments

Within the 500m study corridor of each of the route options there are a number of key heritage constraints in terms of statutorily designated (protected) heritage assets. At this stage, non-designated heritage assets such as known and possible archaeological remains, of uncertain significance, have not been considered. The Route Option will impact on the setting of three Grade II* listed buildings, 21 Grade II listed buildings and three Scheduled Monuments. No assets will be physically impacted by the Route Option.

Construction activities may result in permanent physical alteration to designated heritage assets (demolition, alteration) along with temporary impacts to setting through construction noise and lighting. Potential impacts could occur during the operational phase on the historic environment through permanent or long-term impacts to the setting of designated heritage assets from the presence of new built elements, such as road surfaces, bridge structures and embankments. Direct physical impacts on below ground heritage assets would be expected on the Route Option from construction activities.

The overall impact on form, survival, condition and complexity due to the impact of the Route Option on the setting of designated heritage assets is considered to be Moderate Adverse. The impact on context and period is anticipated to be Neutral.

TAG Historic Environment Impacts Worksheet - Middle Route (Tie-in Options 2B and 2C)

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	**Designated heritage assets (physically affected by the scheme)** 1. None. **Designated heritage assets (possible setting impact)** 2. One Grade I listed building. 3. Five Grade II* listed buildings. 4. 32 Grade II listed buildings. 5. One conservation area. 6. One Grade II Registered Park or Garden.	1. N/A. 2-5. The protection of Listed Buildings and Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 6. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings.	1.N./A. 2. The Grade I listed building is of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. The conservation area is of High significance. 6. Grade II Registered Parks and Gardens are of Medium significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making then of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5-6. N/A.	There would be a **Moderate adverse** on form due to the impact on the setting of the Designated heritage assets.
Survival	1. N/A. 2-5. The listed buildings and conservation area will have high level of survival. 6. The Registered Park or Garden will have a high level of survival.	1. N/A. 2-5. The protection of Listed Buildings and Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 6. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings.	1.N./A. 2. The Grade I listed building is of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. The conservation area is of High significance. 6. Grade II Registered Parks and Gardens are of Medium significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making then of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5-6. N/A.	There would be a **Moderate adverse** on survival due to the impact on the setting of the Designated heritage assets.
Condition	1. N/A. 2-4. The condition of the listed buildings is unknown. 5. The condition of the conservation area is unknown. 6. The condition of the Registered Park or Garden is unknown.	1. N/A. 2-5. The protection of Listed Buildings and Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 6. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings.	1.N./A. 2. The Grade I listed building is of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. The conservation area is of High significance. 6. Grade II Registered Parks and Gardens are of Medium significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making then of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5-6. N/A.	There would be a **Moderate adverse** on condition due to the impact on the setting of the Designated heritage assets.
Complexity	1. N/A. 2-4. The complexity of the listed buildings is unknown. 5. The complexity of the conservation area is unknown. 6. The complexity of the Registered Park or Garden is unknown.	1. N/A. 2-5. The protection of Listed Buildings and Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 6. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings.	1.N./A. 2. The Grade I listed building is of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. The conservation area is of High significance. 6. Grade II Registered Parks and Gardens are of Medium significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making then of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5-6. N/A.	There would be a **Moderate adverse** on complexity due to the impact on the setting of the Designated heritage assets.
Context	1. N/A. 2. Rural. 3. Rural. 4. Rural and urban. 5. Urban. 6. Urban.	The context is not impacted	The context is not impacted	The context is not impacted	**Neutral impact**
Period	1. N/A. 2. Medieval. 3. Medieval/Post-medieval. 4. Post-medieval. 5. Medieval/Post-medieval. 6. Post-medieval.	The period is not impacted	The period is not impacted	The period is not impacted	**Neutral impact**

Reference Sources

National Heritage List for England.
The Suffolk Historic Environment Record of non-designated heritage assets was not consulted, therefore the appraisal has not included a review of buried archaeological assets and undesignated heritage assets. However, it should be noted that below ground remains are likely on all three route options.
Note: A site walkover was not undertaken.

Step 5 - Summary Assessment Score

Moderate adverse

Qualitative Comments

Within the 500m study corridor of each of the route options there are a number of key heritage constraints in terms of statutorily designated (protected) heritage assets. At this stage, non-designated heritage assets such as known and possible archaeological remains, of uncertain significance, have not been considered. The Route Options will impact on the setting of one Grade I listed building, five Grade II* listed buildings, 32 Grade II listed buildings, one conservation area and one Grade II Registered Park or Garden. No assets will be physically impacted by the Route Options.

Construction activities may result in permanent physical alteration to designated heritage assets (demolition, alteration) along with temporary impacts to setting through construction noise and lighting. Potential impacts could occur during the operational phase on the historic environment through permanent or long-term impacts to the setting of designated heritage assets from the presence of new built elements, such as road surfaces, bridge structures and embankments. Direct physical impacts on below ground heritage assets would be expected on the Route Option from construction activities.

The overall impact on form, survival, condition and complexity due to the impact of the Route Options on the setting of designated heritage assets is considered to be Moderate Adverse. The impact on context and period is anticipated to be Neutral.

TAG Historic Environment Impacts Worksheet - Outer Route Option 1A

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	**Designated heritage assets (physically affected by the scheme)** 1. One Conservation Area (see note attached). **Designated heritage assets (possible setting impact)** 2. Two Grade I listed buildings. 3. Three Grade II* listed buildings. 4. 52 Grade II listed buildings. 5. One Grade I Registered Park and Garden. 6. One Scheduled Monument.	1. The protection of Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 2-4. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 5. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings. 6. The protection of Scheduled Monuments is a national concern.	1. The conservation area is of High significance. 2. The Grade I listed building are of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. Grade I Registered Parks and Gardens are of High significance. 6. The Scheduled Monument is of High significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making them of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5. Grade I Registered Parks and Gardens are of national importance. 6. Scheduled Monuments are of national importance.	There would be a **Large adverse impact** to form, due to the direct, physical impact on Coddenham Conservation Area. There would be a **Moderate adverse** impact to form due the impact on the setting of Designated heritage assets.
Survival	1. The conservation area will have high level of survival 2-4. The listed buildings will have high level of survival. 5. The Registered Park and Garden will have a high level of survival. 6. The survival of the Scheduled Monument is unknown.	1. The protection of Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 2-4. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 5. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings. 6. The protection of Scheduled Monuments is a national concern.	1. The conservation area is of High significance. 2. The Grade I listed building are of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. Grade I Registered Parks and Gardens are of High significance. 6. The Scheduled Monument is of High significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making them of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5. Grade I Registered Parks and Gardens are of national importance. 6. Scheduled Monuments are of national importance.	There would be a **Large adverse impact** to survival, due to the direct, physical impact on Coddenham Conservation Area. There would be a **Moderate adverse** impact to survival due the impact on the setting of Designated heritage assets.
Condition	1. The condition of the conservation area is unknown. 2-4. The condition of the listed buildings is unknown. 5. The condition of the Registered Park or Garden is unknown. 6. The condition of the Scheduled Monument is unknown.	1. The protection of Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 2-4. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 5. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings. 6. The protection of Scheduled Monuments is a national concern.	1. The conservation area is of High significance. 2. The Grade I listed building are of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. Grade I Registered Parks and Gardens are of High significance. 6. The Scheduled Monument is of High significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making them of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5. Grade I Registered Parks and Gardens are of national importance. 6. Scheduled Monuments are of national importance.	There would be a **Large adverse impact** to condition, due to the direct, physical impact on Coddenham Conservation Area. There would be a **Moderate adverse** impact to condition due the impact on the setting of Designated heritage assets.
Complexity	1. The complexity of the conservation area is unknown.. 2-4. The complexity of the listed buildings is unknown. 5. The complexity of the Registered Park and Garden is unknown. 6. The complexity of the Scheduled Monument is unknown.	1. The protection of Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 2-4. The protection of Listed Buildings is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 5. The protection of Registered Parks and Gardens is a "material consideration" for the local planning authority when considering any proposed development affecting these sites or their settings. 6. The protection of Scheduled Monuments is a national concern.	1. The conservation area is of High significance. 2. The Grade I listed building are of High significance. 3. The Grade II* listed buildings are of High significance. 4. The Grade II listed buildings are of Medium significance. 5. Grade I Registered Parks and Gardens are of High significance. 6. The Scheduled Monument is of High significance.	1. N/A. 2. Nationally, 2.5% of listed buildings are Grade I making them of exceptional interest. 3. Nationally, 5.8% of listed buildings are Grade II* making them of exceptional interest. 4. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 5. Grade I Registered Parks and Gardens are of national importance. 6. Scheduled Monuments are of national importance.	There would be a **Large adverse impact** to complexity, due to the direct, physical impact on Coddenham Conservation Area. There would be a **Moderate adverse** impact to complexity due the impact on the setting of Designated heritage assets.
Context	1. Rural. 2. Rural. 3. Rural. 4. Rural. 5. Rural. 6. Rural.	The context is not impacted.	The context is not impacted.	The context is not impacted.	**Neutral impact**
Period	1. Medieval/Post-medieval. 2. Medieval/Post-medieval. 3. Medieval/Post-medieval. 4. Post-medieval. 5. Post-medieval. 6. Prehistoric.	The period is not impacted.	The period is not impacted.	The period is not impacted.	**Neutral impact**

Reference Sources

National Heritage List for England.
The Suffolk Historic Environment Record of non-designated heritage assets was not consulted, therefore the appraisal has not included a review of buried archaeological assets and undesignated heritage assets. However, it should be noted that below ground remains are likely on all three route options.
Note: A site walkover was not undertaken.

Step 5 - Summary Assessment Score

Large adverse

Qualitative Comments

Within the 500m study corridor of the Route Option there are a number of key heritage constraints in terms of statutorily designated (protected) heritage assets. At this stage, non-designated heritage assets such as known and possible archaeological remains, of uncertain significance, have not been considered. The Route Option will physically impact on Coddenham Conservation Area. The Route Option will have a significant impact to the setting of the Grade I Registered Shrubland Hall Park. The Route Option will impact on the setting of two Grade I listed buildings, three Grade II* listed buildings and 52 Grade II listed buildings. No designated heritage assets will be physically impacted by the Route Option.

Construction activities may result in permanent physical alteration to designated heritage assets (demolition, alteration) along with temporary impacts to setting through construction noise and lighting. Potential impacts could occur during the operational phase on the historic environment through permanent or long-term impacts to the setting of designated heritage assets from the presence of new built elements, such as road surfaces, bridge structures and embankments. Direct physical impacts on below ground heritage assets would be expected on the Route Option from construction activities.

The overall impact on form, survival, condition and complexity due to the direct, physical impact on Coddenham Conservation Area is considered to be Large Adverse. The overall impact on form, survival, condition and complexity due to the impact of the Route Option on the setting of designated heritage assets is considered to be Moderate Adverse. The impact on context and period is anticipated to be Neutral.

Outer Route Option 1A: Review of the sensitivity of Coddenham Conservation Area

WSP has identified a number of risks and constraints associated with the presence of Coddenham conservation area, which is crossed by the Outer Route option. A brief summary of the key issues identified is provided below.

Coddenham Conservation Area

Coddenham Conservation Area was first designated by East Suffolk County Council in 1973 and was inherited by Mid Suffolk District Council in 1974. The area was re-appraised and extended in 1983.

The Conservation Area Appraisal was published by Mid Suffolk District Council in 2006[1] outlines the following reasons for designation of Coddenham Conservation Area:

- **Listed buildings:** There are a number of listed buildings within Coddenham Conservation Area. The Outer Route option will have no direct, physical impact on listing buildings. The nearest listed building to the Outer Route option is Grade II listed building The Shrubberies (Ref. 1352045), which is located close to the B1078. A minimum distance should be kept from the curtilage of this listed building as the B1078 would be maintained. The Outer Route option may impact on the setting of the listed buildings.
- **Non-designated heritage assets:** There are a number of non-designated heritage assets in Coddenham Conservation Area which are identified as being of interest as they were constructed using traditional building materials. These are located in the centre of Coddenham. The Outer Route option will have no direct, physical impact on this feature. However, the Outer Route option may impact on the setting of the non-designated heritage assets.
- **Buildings with former usage:** There are a number of buildings with former usage in Coddenham Conservation Area which are identified. These are located in the centre of Coddenham. The Outer Route option will have no direct, physical impact on these buildings. However, the Outer Route option may impact on the setting of these buildings.
- **Monuments and sites of archaeological significance:** There are a number of monuments and sites of archaeological significance within and outside Coddenham Conservation Area. In the vicinity of the Outer Route option, there are two monuments and sites of archaeological significance. These are located to the west of Grade II listed building The Shrubberies (Ref. 1352045). The Outer Route option is not located within the footprint of monuments and site of archaeological significance identified in the 2018 Conservation Area Appraisal Document[1].
- **Important vistas:** There are a number of 'important vistas' identified in the appraisal which contribute to the character and appearance of Coddenham Conservation Area. The Outer Route option is likely to affect several of these vistas, including the views from the Grade II listed building The Shrubberies (Ref. 1352045) looking toward Coddenham village in the northeast direction and the views from Coddenham village (and primarily the Grade I listed Church of St Mary) looking toward the river and open fields in the southwest, south and southeast directions. Further detailed assessment (including for landscape) would be required to assess this issue and define appropriate level of mitigations.
- **Tree Protection Orders (TPOs):** A number of TPOs are recorded within Coddenham Conservation Area. Three TPOs would be directly impacted by the Outer Route option the intersection of the B1078 with Sandy Lane. Seven TPOs are located along the southern edge of the B1078 but these would not be physically affected by the Outer Route option as this

[1] Mid Suffolk County Council (2006). *Coddenham Conservation Area Appraisal.* Available at: https://www.babergh.gov.uk/assets/Conservation-Area-Appraisals/Coddenham2008CAA.pdf

section of the road would be kept as it is. One TPO is located to the southern side of the water course passing south of Coddenham. The most prominent trees within Coddenham are those comprising the parkland setting of the river valleys. Arboricultural survey and assessment is recommended at OBC-stage to assess the condition of trees and options for management. This would also ascertain how the TPOs contribute to the character of Coddenham Conservation Area. Consent of the Local Planning Authority would be required for trees protected by TPOs. If consent is given, it can be subject to conditions which have to be followed.

- **Definitive footpaths:** Several 'definitive footpaths' are highlighted in the appraisal. One footpath links the Grade I Shrubland Hall to the east of Coddenham village and passes next to Grade II listed building The Shrubberies (Ref. 1352045). This footpath is crossed by the Outer Route option and would therefore be removed. An alternative footpath would need to be put in place to maintain the local links between the different features of interest of the village and the wider area.
- **Traffic disturbance:** The 2006 Conservation Area Appraisal Document[1] indicates that *'The B 1078 that snakes through the village centre also brings its detractions in the form of traffic, which unfortunately includes heavy goods vehicles. These last are a threat to overhanging listed buildings, cause congestion and can adversely impact on the appearance and character of the conservation area. Alternative routes should be sought.'* Hence, the construction of a double carriageway adjacent to the existing road is likely to increase traffic south of Coddenham Village.

Historic England states[2] that *'The special character of these areas does not come only from the quality of their buildings. Elements such as the historic layout of roads, paths and boundaries and characteristic building and paving materials all contribute to the familiar and cherished local scene.' (…) Conservation area designation is the means of recognising the importance of all these factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense. (…) Under the National Planning Policy Framework conservation areas are designated heritage assets and their conservation is to be given great weight in planning permission decisions.'*

Approach to manage key risks and constraints

It has been established that both veteran trees protected by Tree Preservation Orders (TPO) (associated with the Conservation Area), and potential bat roosts will be a key constraint. However, it is feasible that the Outer Route can avoid the trees in the field north of the B1078 Needham road, and the design team is looking into the viability of having a roundabout at the intersection with Needham road and Sandy lane, again with the focus on avoiding the need to cut down TPO trees.

Potential mitigation options should be investigated further at the OBC stage for the related physical impact on the conservation area itself including the potential impact on views, the setting of listed buildings, alteration of the local landscape character near the river, and increasing disturbance from traffic. It is also recommended to investigate further mitigation options for the potential impact to the setting of the Grade I Registered Park and Garden, and other potential impacts on unlisted buildings, monuments and site of archaeological significance.

The current alignment of the Outer Route appears to be the optimal route. It does not have direct impact on any listed buildings identified along the Outer Route option. It does not physically impact on the Grade I Registered Park and Garden to the south of the Outer Route, which cannot be

[2] Historic England (2019). Conservation Areas Page. Available at URL : https://historicengland.org.uk/advice/hpg/has/conservation-areas/ (consulted on 29/08/2019)

crossed, and the presence of the watercourse and its associated flood zone (including Flood Zone 3b – Functional Floodplain) to the north. It does however physically impact on the conservation area and has the potential to impact on the setting of the park and garden and designated heritage assets located within the conservation area.

Based on the preliminary assessments to date, it appears that although the option is feasible, it is important to note the high level of constraints which is reflected in the adverse scores in the WebTAG appraisal.

Conclusion and Next steps

WSP has identified a number of risks and constraints associated with the presence of Coddenham Conservation Area, which is crossed by the Outer Route option, and the presence of the Grade I Registered Park and Garden, which is adjacent to the Outer Route.

The potential impacts associated with the conservation area, and the impacts to the setting of designated heritage assets and to the Grade I Registered Park and Garden, and options for mitigation, will need to be examined further at OBC-stage.

Should the Outer Route option be considered further by SCC at the OBC stage, WSP recommend the following:

- The key risks and constraints identified at corridor level for the Outer Route will require more detailed assessments (considering the physical extent and particular features values of the conservation area, and the impacts to the setting of designated heritage assets including the Grade I Registered Park and Garden) and development of mitigation measures. These will need to progress as a priority; and
- Consultation with Historic England and SCC Heritage Officer would be required to seek their opinion on the Proposed Scheme given the constraints identified.

Biodiversity WebTAG Worksheets

TAG Biodiversity Impacts Worksheet - Inner Route Option 2D

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Alde-Ore and Butley Estuaries Special Area of Conservation (SAC)	Estuary complex designated for: - Annex I habitat as a primary reason for selection: Estuaries (this estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar); and - Annex I habitats present as a qualifying feature: Mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadows.	**International**	**Very high** - Habitats of international importance.	**Target habitat** - The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aim of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Special Protection Area (SPA)	Estuary complex designated for: - Internationally important breeding populations of: avocet *Recurvirostra avosetta;* lesser black-backed gull *Larus fuscus* ;Little tern *Sternula albifrons* ; marsh harrier *Circus aeruginosus* ; sandwich tern *Thalasseus sandvicensis;* - Internationally important non-breeding populations of: avocet, common redshank *Tringa totanus* and ruff *Calidris pugnax* - Internationally important assemblages of seabirds including: herring gull *Larus argentatus* , black-headed gull Larus ridibundus, lesser black-backed gull , little tern, sandwich tern; and - Internationally important waterfowl populations over winter, including: black-tailed godwit *Limosa limosa islandica* , dunlin *Calidris alpina alpina* , lapwing *Vanellus vanellus* , shoveler *Anas clypeata* , teal *Anas crecca* , wigeon *Anas penelope* , shelduck *Tadorna tadorna,* white-fronted goose *Anser albifrons albifrons* , common redshank and avocet.	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC). - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Ruff: are declining nationally and are on the Red BoCC list. - Herring gull: populations have suffered ongoing population declines nationally and are on the Red BoCC list. - Black-headed gull: is the most widely distributed seabird species breeding in the UK but is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dunlin: populations are in decline nationally and is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Ramsar site	Estuary complex designated for: - supporting a number of nationally-scarce British Red Data Book invertebrates including: starlet sea-anemone Nematostella vectensis, lagoon sand shrimp Gammarus insensibilis,ground lackey Malacosoma castrensis, Fancy-legged fly Campsicnemus magius, Chinless Thistle-cheilosia Cheilosia velutina, Empis prodomus, Dixella attica, Hylaeus euryscapus, swollen spire snail Pseudamnicola confusa, Euophrys browningi, Duffy's Bell-headed Spider Baryphyma duffeyi, Haplodrassus minor and Trichoncus affinis; - supporting a number of nationally-scarce plant species including: marsh-mallow Althaea officinalis, sea heath Frankenia laevis, beach pea Lathyrus japonicus, Dittander Lepidium latifolium, bur medick Medicago minima, Curved Hard Grass Parapholis incurva, Borrer's saltmarsh-grass Puccinellia fasciculata, spiral tasselweed Ruppia cirrhosa, perennial glasswort Sarcocornia perennis, marsh sowthistle Sonchus palustris, suffocated clover Trifolium suffocatum, yellow vetch Vicia lutea and narrow-leaved eelgrass Zostera angustifolia - supporting a notable assemblage of breeding and wintering birds including: marsh harrier, Mediterranean gull Larus melanocephalus, sandwich tern, little tern, black-tailed godwit, spotted redshank Tringa erythropus, common greenshank Tringa nebularia, white-fronted goose, shelduck, wigeon, teal, pintail Anas	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Starlet sea-anemone: The Suffolk BAP recognises starlet sea-anemone as a priority species. All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Mediterranean gull: populations have increased nationwide. it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list. - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC) - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**

Deben Estuary SPA	Estuary designated for: - supporting internationally important populations of over-wintering avocet and dark-bellied brent goose, *Branta bernicla bernicla.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**
Deben Estuary Ramsar site	Estuary designated for: - supporting a population of the narrow-mouthed whorl snail, *Vertigo angustio;* - supporting non-breeding dark-bellied brent goose; - noteworthy fauna: supporting nationally important populations of: black-tailed godwit and common greenshank in spring/autumn; and over-wintering bean goose *Anser fabalis fabalis* , shelduck, avocet, spotted redshank and common redshank; and - noteworthy flora: Nationally important species occurring on the site including: marsh-mallow, slender hare's-ear *Bupleurum tenuissimum,* dittander,Borrer's Saltmarsh-grass, perennial glasswort, shrubby sea-blite *Suaeda vera* and narrow-leaved eelgrass *Zostera angustifolia.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Narrow-mouth whorl snail: is recognised as a target species under the Suffolk BAP. One of Britain's rarest snails which has suffered serious decline. A target of the BAP is to identify further sites where populations are thought to exist and enable existing populations to increase in size. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - Bean goose: populations have declined. It is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - All plant species for which the Ramsar site is designated have threatened or scarce populations within the UK.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**
Hamford Water SAC	Estuarine basin designated for: - Annex II species that are a primary reason for selection of this site: Fisher's estuarine moth *Gortyna borelii lunata* for which Hamford Water SAC is the most important site in the UK.	**International**	**Very high**	The Suffolk BAP does not identify a trend in relation to the Fisher's estuarine moth. Nationally, the Fisher's estuarine moth is very rare and has a localised distribution with known populations restricted entirely to Hamford Water and one other location in Kent.	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Hamford Water SPA	Estuarine basin designated for supporting internationally important: - breeding populations of little tern; - non-breeding populations of: avocet, golden plover, ruff, ringed plover *Charadrius hiaticula* , black-tailed godwit, dark-bellied brent goose, grey plover *Pluvialis squatarola* and teal; and - assemblages of waterfowl	**International**	**Very high**	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Golden plover: wintering populations have declined nationally and the species is on the Green BoCC list. - Ruff: populations are declining nationally and it is on the Red BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Hamford Water Ramsar site	Estuarine basin designated for supporting internationally important: - non-breeding populations of: ringed plover, common redshank, dark-bellied brent goose, black-tailed godwit, and grey plover. Additionally, noteworthy fauna and flora occurring on the site: - Breeding Mediterranean gull, black-headed gull, Little tern; and non-breeding ruff, spotted redshank, common greenshank, shelduck, teal, avocet, golden plover, knot *Calidris canutus* . - Hog's fennel *Peucedanum officinale.*	**International**	**Very high**	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Mediterranean gull: populations have increased nationwide. it is on the Amber BoCC list. - Black-headed gull: is the most widely distributed seabird species breeding in the UK but is on the Amber BoCC list. - Ruff: populations are declining nationally and it is on the Red BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Golden plover: wintering populations have declined nationally and the species is on the Green BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Hog's fennel: is a nationally rare plant species.	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Orfordness-Shingle Street SAC	Coastal lagoons and shingle designated for: - Annex I habitat as a primary reason for selection: coastal lagoons, annual vegetation of drift lines and perennial vegetation of stony banks.	**International**	**Very high** - Habitat of international importance.	**Target habitat** - The Suffolk BAP recognises coastal lagoons as target habitats due to their decline both nationally and locally. The primary aim of the BAP is to increase the extent of coastal lagoons to 1992 baseline levels.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**

Outer Thames Estuary SPA	Estuary complex designated for internationally important: - breeding populations of: common tern, *Sterna hirundo* and little tern, *Sternula albifrons;* and - non-breeding populations of: red-throated diver, *Gavia stellata.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Common tern: populations have declined. It is on the Amber BoCC list. - Red throated diver: winter populations trends are unknown and the species is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Sandlings SPA	Heathland and forest designated for: - breeding populations of: nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea.*	**International**	**Very high** - Habitats and species of international importance.	**Target species -** Both nightjar and woodlark are covered under the Suffolk BAP due to their declining populations driven by habitat loss. The BAP aims to increase these species extent and improve suitable habitat. Nightjar populations have declined nationally and it is on the Amber BoCC list. Woodlark populations have increased and it is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Staverton Park and the Thicks, Wantisden SAC	Broadleaved deciduous woodland designated for: - Annex I habitat as a primary reason for selection: old acidophilous oak woods with English oak *Quercus robur* on sandy plains.	**International**	**Very high** - Habitat of international importance.	The Suffolk BAP does not identify a trend in relation to this habitat. Old acidophilous oak woods are limited to the south and east of England following national decline.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Stour and Orwell Estuaries SPA	Estuaries designated for: - breeding populations of avocet; - non-breeding populations of: black-tailed godwit, dark-bellied brent goose, dunlin, grey plover, *Pluvialis squatarola,* knot, pintail; and common redshank; and - an internationally important assemblage of over-wintering waterfowl, including: cormorant *Phalacrocorax carbo*, pintail, ringed plover, grey plover, dunlin, black-tailed godwit, redshank, shelduck, great crested grebe *Podiceps cristatus*, curlew *Numenius arquata,* dark-bellied brent goose, wigeon *Anas penelope*, goldeneye *Bucephala clangula*, oystercatcher *Haematopus ostralegus*, lapwing, knot, turnstone *Arenaria interpres.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Great crested grebe: populations have increased nationally and it is on the Green BoCC list. - Curlew: populations have suffered large declines and it is on the Red BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Goldeneye: populations have increased and it is on the Amber BoCC list. - Oystercatcher: population trends are currently unknown; it is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Turnstone: populations are in decline nationally and is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries SPA is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Stour and Orwell Estuaries Ramsar site	Estuaries designated for: - supporting seven nationally scarce plant species: stiff saltmarsh-grass *Puccinellia rupestris*; small cord-grass *Spartina maritima*; perennial glasswort; lax-flowered sea lavender *Limonium humile*; and the eelgrasses *Zostera angustifolia*, *Z. marina* and *Z. nolte;* - supporting five British Red Data Book invertebrates: the muscid fly *Phaonia fusca*; the horsefly *Haematopota grandis*; yellow-striped bear-spider *Arctosa fulvolineata* and *Duffy's Bell-headed Spider*; and the endangered swollen spire snail *Mercuria confusa;* - supporting waterfowl assemblages of international importance; and - supporting internationally important populations of: common redshank on passage and dark-bellied brent goose, pintail, grey plover, knot, dunlin, black-tailed godwit and common redshank over winter.	**International**	**Very high** - Habitats and species of international importance.	**Target habitat -** The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aims of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition. - All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries Ramsar is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Ipswich Heaths SSSI	Comprised of Martlesham and Purdis Heaths. Martlesham Heath is notable for supporting the largest colony of the silver-studded blue butterfly in East Anglia, as well as a number of other species. Acid grassland occupies substantial areas and, where acid grassland forms a mosaic with heath there is a wider range of associated species.	**National**	**High** - Site of national importance.	**Target habitats** - Lowland dry acid grassland and lowland heathland are recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas.	**High** - Nationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**

Little Blakenham Pit SSSI	Former chalk workings which support one of the few examples of chalk grassland flora in East Suffolk. A range of plant species are present including populations of Pyramidal Orchid *Anacamptis pyramidalis* and Bee Orchid *Ophrys apifera* and other unusual species include Man Orchid *Aceras anthropophorum* and Southern Marsh Orchid *Dactylorhiza praetermissa* . Daubenton's bat *Myotis daubentoni* , Natterer's bat *Myotis nattereri* and Brown Long-eared bat *Plecotus auritus* roost within the site with occasional Whiskered bat *Myotis mystacinus* and Brandt's bat *Myotis brandti* recorded.	**National**	**High** - Site of national importance, with a range of chalk grassland species	Target species - The Suffolk BAP identifies Lowland Calcareous Grassland as an HPI and identifies Man orchid as a priority species. Thirteen bat species are identified as priority species within the Suffolk BAP, including Daubenton's which is declining on a national scale. The Suffolk BAP aims to: 1) Maintain range of bat species across Suffolk at 2009 extent. 2) Increase coverage of bat surveys. 3) Provide training for bat workers and the general public.	**High** - Nationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Sinks Valley, Kesgrave SSSI	A valley comprising open water, swamp, spring-fed fen, wet grassland, and wet alder woodland, dry acid grassland, heathland and oak woodland habitats. Sinks Valley, Kesgrave, lies within 500m of the Route.	**National**	**High** - Site of national importance.	**Target habitats -** Lowland dry acid grassland and lowland heathland are recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas. The Suffolk BAP recognises Lowland Fen as an HPI and aims to ensure the long-term sustainable management of all fens over 5ha, which are currently in favourable condition or will be brought into favourable condition following restoration; promote the rehabilitation of degraded or declining fens; encourage the creation of new fens; and maintain and enhance populations of priority species associated with Suffolk fens.	**High** - Nationally important site with limited potential for substitution.	**Minor Negative -** The SSSI is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Slight adverse**
Bloomfield's Farm Meadow CWS	An area of meadow habitat with a range of wetland plants as well as heath spotted orchid *Dactylorhiza maculata* and southern marsh orchid *Dactylorhiza praetermissa* .	**County**	**Medium** - Bloomfield's Meadow CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Kesgrave Wood and Sinks Valley CWS	An area of plantation woodland and acid grassland, healthland and scrub. The woodland areas support range of plant and animal species and the areas of heathland and grassland support some scarce plant species.	**County**	**Medium** - Kesgrave Wood and Sinks Valley CWS is likely to be of county importance.	**Target habitat** - Lowland dry acid grassland and lowland heathland are recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas. The Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Lux Wood CWS	An area of ancient deciduous woodland supporting a range of native trees, shrubs and ground flora. The woodland also provides habitat for breeding birds, including nightingale *Luscinia megarhynchos*	**National**	**High -** Ancient woodland is important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk. The Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**High** - Nationally important habitat with limited potential for substitution.	**Intermediate Negative** - The Route will lie directly adjacent to the southern edge of Lux Wood CWS. Therefore there may be some direct impacts on the woodland such as increases in noise, air and light pollution. Further baseline data is required in order to develop an assessment.	**Large adverse**
Martlesham Common CWS	An area of heathland comprising bracken, gorse and small araes of acid grassland and supporting silver-studded blue butterflies *Plebejus argus*.	**County**	**Medium** - Martlesham Common CWS is likely to be of county importance.	**Target habitat** - Lowland dry acid grassland and lowland heathland are recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The BAP aims to maintain the extent of acid grassland and lowland heathland and seeks to restore significant areas.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Martlesham Plantation Acid Grassland CWS	A small area of acid grassland supporting a range of herbs and grasses typical of this habitat type.	**County**	**Medium** - Martlesham Plantation Acid Grassland CWS is likely to be of county importance.	**Target habitat** - Lowland dry acid grassland and lowland heathland are recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas.	**Medium** - County value sites with potential for substitution	**Intermediate Negative** - The Route will lie directly adjacent to the northern edge of Martlesham Plantation Acid Grassland CWS. Therefore there may be some direct impacts on the woodland such as increases in noise, air and light pollution. Further baseline data is required in order to develop an assessment.	**Moderate adverse**
Osier Bed and Martlesham Plantation Meadows CWS	An area containing grassland habitats and a former osier bed containing mature trees. Two meadow areas comprise unimproved wet grassland containing a range of species including southern marsh orchid. The easternmost meadow holds water in places, supporting wading birds.	**County**	**Medium** - Osier Bed and Martlesham Plantation Meadows CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline required in order to develop an assessment.	**Slight adverse**
Playford Alder Carr CWS	An area of deciduous broadleaved woodland with some wet areas, evidence of past coppicing and a diverse age structure. A range of native woodland ground flora species are also present.	**County**	**Medium** - Playford Alder Carr CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**

Playford Mere CWS	An area comprising a number of artificial ponds, linked by a series of channels, areas of fen habitat, scrub and poplars. A range of wetland birds and wetland plants have been recorded.	**County**	**Medium** - Playford Mere CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises Lowland Fen as an HPI and aims to ensure the long-term sustainable management of all fens over 5ha, which are currently in favourable condition or will be brought into favourable condition following restoration; promote the rehabilitation of degraded or declining fens; encourage the creation of new fens; and maintain and enhance populations of priority species associated with Suffolk fens.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Pogson's Farm Meadow CWS	An area comprised of grassland, scrub, hedges and trees. A range of grassland species are present in the unimproved meadow areas. Wetter areas support typical wetland plant species.	**County**	**Medium** - Pogson's Farm Meadow CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline required in order to develop an assessment.	**Slight adverse**
Pumping Station Meadow CWS	An area comprising scrub and fen habitats, fed by springs. A range of wet grassland species are present in unimproved meadow areas. Wetter areas support a range of wetland plant species including southern marsh orchid. Barn owl *Tyto alba* have been recorded.	**County**	**Medium** - Pumping Station Meadow CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises Lowland Fen as an HPI and aims to ensure the long-term sustainable management of all fens over 5ha, which are currently in favourable condition or will be brought into favourable condition following restoration; promote the rehabilitation of degraded or declining fens; encourage the creation of new fens; and maintain and enhance populations of priority species associated with Suffolk fens.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
River Gipping (Sections) CWS	The River Gipping (Sections) CWS is bisected by the Route. It supports a range of emergent vegetation consisting and provides suitable habitat for breeding water birds. Populations of fish including roach *Rutilus rutilus* , dace *Leuciscus leuciscus* , European eel *Anguilla anguilla* , tench *Tinca tinca* , perch *Perca* sp. and pike *Esox lucius* occur in the river.	**County**	**Medium -** A range of species are present within a potential HPI habitat.	**Target habitat -** The River Gipping may represent River HPI habitat but baseline data is required to confirm this. The Suffolk BAP lists eel as a priority species has not produced an individual action plan and no local trend has been identified. Nationally the European eel is declining.	**Medium** - County value site with limited potential for substitution.	**Major negative** - The Route will bisect the River Gipping (Sections) CWS, resulting in potential habitat loss, habitat fragmentation and disturbance impact in addition to indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
RNR 144 CWS	Calcareous grassland flora present including Pyramidal orchids. This site is also a Roadside Nature Reserve.	**County**	**Medium** - RNR 144 CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Suffolk Water Park CWS	A disused gravel pit supporting passage wading birds and over-wintering wildfowl. Thousands of black-headed and lesser black-backed gulls roost in Suffolk Water Park CWS. In addition, eight species of dragonfly have been recorded within the CWS.	**County**	**Medium** - Suffolk Water Park CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises eutrophic waters as a target habitat. The BAP aims to: halt deterioration, restore ponds and ensure protection of eutrophic standing waters.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Ancient Woodland	Ancient woodland is present within 500m of the Route at Lux Wood which is also a CWS (see above)	**National**	**High -** Ancient woodland is important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High** - Nationally important habitat with limited potential for substitution.	**Intermediate Negative** - The Route will lie directly adjacent to the southern edge of Lux Wood CWS. Therefore there may be direct impacts on the woodland such as increases in noise, air and light pollution. Further baseline data is required to develop an assessment.	**Large adverse**
Coastal and floodplain grazing marsh HPI	Two small areas of coastal and floodplain grazing marsh HPI are known to be present within 500m of the Route.	**County**	**Medium** - Detailed habitat surveys have not been undertaken although it is expected that the Route will impact HPI of county value.	**Target habitat -** In decline locally and nationally. The BAP aims to restore and re-create 200ha of grazing marsh.	**Medium** - County value habitat with limited potential for substitution	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Deciduous woodland HPI	It is estimated that the Route will bisect one area of deciduous woodland HPI and will lie directly adjacent to a further two areas of deciduous woodland HPI.	**County**	**Medium -** Deciduous woodland HPI is important at a county level.	**Target habitat** - Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect deciduous woodland HPI, removing habitat and reducing habitat connectivity. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**

Hedgerow HPI	The Route will bisect numerous hedgerows. All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are a HPI.	**County**	**Medium -** Hedgerows are important at a county level.	**Target habitat -** The Suffolk BAP recognises hedgerows as target habitats. The aim is to ensure that most existing field boundaries are hedged, by encouraging planting along currently un-hedged boundaries.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect numerous hedgerows, removing habitat and reducing connectivity to surrounding areas. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an	**Moderate adverse**
Lowland dry acid grassland HPI	The Route will result in removal of a small area of lowland dry acid grassland at the eastern end of the Route.	**County**	**Medium -** Lowland dry acid grassland is important at a county level.	**Target habitat -** Lowland dry acid grassland is recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The decline in unimproved acid grassland mirrors the loss of other unimproved grassland types in Suffolk. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will remove an area of lowland dry acid grassland, removing habitat and reducing habitat connectivity. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an	**Moderate adverse**
Lowland heath HPI	A small area of lowland heath HPI is present within 500m of the Route.	**County**	**Medium -** Lowland heath HPI is important at county level.	**Target habitats** - Lowland heathland is recognised as an HPI by the Suffolk BAP as a habitat which has declined nationally and locally. The BAP aims to maintain the current extent of lowland heathland to ensure no net loss.	**Medium** - County value habitat with limited potential for substitution.	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Pond HPI	The Route crosses or lies directly adjacent to an estimated two ponds which may be Pond HPI.	**County**	**Medium** - Pond HPI is important at a county level.	**Target habitat** - The Suffolk BAP recognises Pond HPI as a target habitat, along with other eutrophic waters. The BAP aims to: halt deterioration, restore ponds and ensure protection of eutrophic standing waters.	**Medium** - County value habitat with potential for substitution.	**Minor negative** - The Route will bisect approximately two ponds, removing habitat. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Slight adverse**
River HPI	The Route bisects approximately five watercourses which may qualify as River HPI. Further baseline data is required to calculate the presence and quantity of River HPI.	**County**	**Medium** - River HPI is important at a county level.	The Suffolk BAP does not identify a trend in relation to this habitat type.	**Medium** - County value habitat with limited potential for substitution.	**Major negative** - The Route will bisect approximately five watercourses which may be River HPI, causing disturbance and potential disruption. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Traditional Orchard HPI	Traditional Orchard HPI is present within 500m of the Route in an estimated one location.	**County**	**Medium** - Traditional Orchard HPI is important at a county level.	**Target habitat** - In decline nationally however not enough data is available to form an accurate trend for Suffolk's traditional orchards. BAP aims to improve one traditional orchard annually.	**Medium** - County value habitat with limited potential for substitution.	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Bats	Woodlands, hedgerows, mature trees and scrub are present within the Route and provide suitable habitat for foraging, commuting and roosting bats. Detailed baseline data has not yet been collected. Desk Study records of brown long-eared, pipistrelle species *Pipistrellus sp*, Daubenton's and Natterer's roosts are located within 500m of this Route. Activity records of barbastelle *Barbastella barbastellu*s and serotine *Eptesicus serotinus* have also been returned.	**Regional**	**High -** Bat species present of regional importance.	**Target species** - Although a local trend in relation to the target species is not known, the Suffolk BAP identifies 13 bat species (including barbastelle). Of these: brown long-eared *Plecotus auritus*, serotine *Eptesicus serotinus* and Daubenton's *Myotis daubentonii* bats are declining on a national scale. Barbastelle are rare bats and there is insufficient data to produce a robust population trend. The Suffolk BAP aims to: 1) Maintain range of species across Suffolk at 2009 extent. 2) Increase coverage of surveys. 3) Provide training for batworkers and the general public. Bats are notably in decline across the UK due to widespread habitat loss.	**High** - Habitats within the Route are likely to support foraging and roosting bats.	**Intermediate Negative** - The Route will affect habitat likely to support commuting, foraging and roosting bats (including barbastelle). The Route could also have indirect impacts through habitat severance which may require extensive mitigation. Further baseline required in order to develop an assessment.	**Large adverse**

Birds	Habitats present are suitable for use by nesting birds. The arable fields and grasslands provide potential foraging habitat for passage/over-wintering birds such as flocks of thrushes, wading birds and waterfowl. Bird species with additional protection such as barn owl *Tyto alba* , have also been recorded within 500m of the Route.	**Regional**	**High** - Detailed baseline data has not yet been collected, although it is expected that, given the presence of protected sites designated for birds within 20km of the Route, habitats within the Route will support bird species at a regional level.	**Target species** - The Suffolk BAP identifies a range of bird species in significant decline on a local and national level. This includes several farmland bird species currently in decline due to changing agricultural practices and habitat loss. Barn owl, bittern *Botaurus stellaris* , bullfinch *Pyrrhula pyrrhula* , corn bunting, *Emberiza calandra,* grey partridge *Perdix perdix* , Linnet *Linaria cannabina* , nightjar, reed bunting *Emberiza schoeniclus* , skylark *Alauda Arvensis* , song thrush *Turdus philomelos* , spotted flycatcher *Muscicapa striata* , stone curlew *Burhinus oedicnemus* , tree sparrow *Passer monatnus* and turtle dove *Streptopelia turtur* are SPI and have archived BAPs in Suffolk. Bullfinch, corn bunting, grey partridge, linnet, skylark , spotted flycatcher, stone curlew and turtle dove are currently declining in Suffolk although it is not known whether these species are present in the proposed development area.	**High** - The site is likely to support a diverse range of breeding and wintering bird species of local importance.	**Intermediate Negative** - The Route will result in the loss of habitats likely to be used by birds and may give rise to further impacts arising from changes in biotic conditions. Habitats within the Route could be used as supporting habitat for qualifying bird species of nearby European designated sites. Further baseline required in order to develop an assessment, particularly on Schedule 1 birds and areas which may act as supporting habitat for birds present within nearby SPA and Ramsar sites.	**Large adverse**
Badger	Woodlands, hedgerows and grassland habitats present along the Route provide suitable habitat for foraging badgers *Meles meles* , and suitable locations for sett construction. Badgers are widespread across the UK and are likely to be present. Desk study records of badger were returned within 500m of this Route.	**County**	**Medium** - Detailed baseline data has not yet been collected.	The Suffolk BAP does not identify a trend in relation to this species, although nationally badgers have shown a significant increase in numbers (c.88% since the 1980s).	**Medium** - badger setts may be present in the vicinity of the Route, especially in areas of woodland.	**Medium** - The site is likely to support badgers likely to of value at County level. Badger setts may be present in the vicinity of the Route, especially in areas of woodland.	**Slight adverse**
Hazel dormouse	Areas of woodland and hedgerows provide habitat suitable for hazel dormouse. No desk study records of hazel dormouse were present within 500m but a single record was returned of the species within 2km of the Route indicating presence of the species within the landscape.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Declining both nationally and locally. Suffolk is on the edge of the hazel dormouse's UK range. Decline due to isolation of small woodlands and the intensive management of hedgerows. An objective of the Suffolk BAP is the reinstatement of hedgerows to improve connectivity between hazel dormouse sites.	**High -** hazel dormouse are a species of high biodiversity value on a national level.	**High -** hazel dormouse are a species of high biodiversity value on a national level and may be present in woodlands crossed by the Route	**Slight adverse**
Aquatic Macroinvertebrates	Watercourses and ponds are likely to support aquatic macroinvertebrates, which may include notable or protected species. White-clawed crayfish *Austropotamobius pallipes* and molluscs are discussed separately below.	**County**	**Medium** - Detailed baseline data has not yet been collected.	**Target species -** The only aquatic invertebrate targeted by the Suffolk BAP is the depressed river mussel *Pseudanodonta complanata* . The depressed river mussel is found in the River Waveney. The cause of their population decline is uncertain due to lack of data. A target of the Suffolk BAP is to encourage appropriate habitat management for this species and to determine the distribution of the Depressed River Mussel in Suffolk river catchments similar in character to the Waveney.	**Medium -** freshwater habitats may support notable aquatic macroinvertebrate species.	**Medium -** freshwater habitats along the Route may support notable aquatic macroinvertebrate species of up to medium biodiversity value.	**Slight adverse**
White-clawed Crayfish	White-clawed crayfish have been recorded within Suffolk within the River Gipping which is crossed by the Route. The species may also be present within other watercourses crossed by the Route.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Once widespread across Britain. In Suffolk there a marked reduction in their range. They are now classed as an endangered species and risk becoming locally extinct. Only three sites in Suffolk are known to contain populations of white-clawed crayfish (River Gipping, Bucklesham Mill River and a private lake near Clayton).	**Medium** - white clawed crayfish may be present in the vicinity of the Route, in areas of freshwater.	**Medium** - white clawed crayfish may be present in the vicinity of the Route, in areas of freshwater with populations likely to be of up tto medium biodiversity value.	**Slight adverse**
Fish	The Route crosses several watercourses including the River Gipping which may support protected or notable fish species.	**County**	**Medium -** Detailed baseline data has not yet been collected.	Suffolk lists three species of freshwater fish as priority species (European eel, river lamprey *Lampetra fluviatili* s and spined loach *Cobitis taenia*) but none of these have an individual action plan and no local trend has been identified. Nationally the European eel and river lamprey are declining and no trend has been identified for the spined loach.	**Medium** - Watercourses are likely to support fish populations, which may include protected or notable species.	**Medium** - Watercourses along the Route are likely to support fish populations of up to medium biodiversity value, which may include protected or notable species.	**Slight adverse**
Otter	Otter *Lutra lutra* have been recorded within watercourses within 500m of the Route including the River Gipping. Watercourses crossed by the Route may provide suitable habitat for otter.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Formerly widespread but almost extinct by the 1970s. Reintroductions in the 1980s and the cessation of otter hunting has led to a strong recovery in Suffolk with an increasing population. A BAP target is to maintain and expand existing otter populations.	**High -** Otter are a species of high biodiversity value on a national level.	**High -** Otter are a species of high biodiversity value and may be present in watercourses which the Route bisects.	**Slight adverse**

Water Vole	Water vole *Arvicola amphibius* have been recorded within 500m of the Route. Watercourses crossed by the Route may support water vole.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Water vole are declining locally and nationally. Water vole decline is mainly due to population fragmentation and isolation as well as predation by the American mink *Neovison vison* which is present but controlled in Suffolk. The priority target of the Suffolk BAP for this species is to halt the decline and possible extinction of water vole in Suffolk.	**Medium** - Water vole are a species of medium biodiversity value on a national level.	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior*, Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia*, have been recorded within 2km of the Route. All records	**Slight adverse**
Reptiles	Areas of rough grassland and scrub are likely to be suitable to support widespread reptile species such as adder *Vipera berus*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix helvetica* and slow worm *Anguis fragilis*. Desk study records of adder, common lizard, grass snake and slow worm were returned within 500m of the Route.	**County**	**Medium -** Detailed baseline data has not yet been collected.	The Suffolk BAP does not identify a trend in relation to these species. Adder *Vipera berus,* grass snake, slow worm and common lizard have undergone national population declines.	**Medium** - the Route may result in removal or fragmentation to grassland and scrub habitats used by reptiles.	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior*, Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia*, have been recorded within 2km of the Route. All records of narrow-mouthed whorl snail and Desmoulin's whorl snail are restricted to within the Deben	**Slight adverse**
Molluscs	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior*, Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia*, have been recorded within 2km of the Route. All records of narrow-mouthed whorl snail and Desmoulin's whorl snail are restricted to within the Deben Estuary Ramsar site.	**National**	**High** - there is potential for species of national importance to be present.	**Target species -** Desmoulin's whorl snail, narrow-mouthed whorl snail, little ramshorn whirlpool snail *Anisus vorticulus* and shining ram's-horn snail *Segmentina nitida* all have BAP's. Desmoulin's whorl snail, Narrow-mouth whorl snail and Shining ram's-horn snail are in decline due to the destruction of wetlands through changes in hydrological conditions, grazing pressure and physical disturbance. BAP targets for these species are to maintain viable populations and determine the extent of the species distribution.	**High** - nationally important species.	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior*, Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia*, have been recorded within 2km of the Route. All records of narrow-mouthed whorl snail and Desmoulin's whorl snail are	**Slight adverse**
Terrestrial Invertebrates	Habitats including woodland, scrub and grassland are likely to support terrestrial invertebrates. The desk study returned records of a range of notable invertebrates within 500m of the Route and roman snail (see molluscs, above) within 2km of the Route.	**County**	**Medium** - Baseline data has not been collected but It is expected that the range of habitats along the Route will support terrestrial invertebrates that are of medium importance.	**Target species** - The Suffolk BAP identifies a declining trend in certain invertebrate species. The stag beetle *Lucanus cervus*, dingy skipper *Erynnis tages*, silver-studded blue *Plebejus argus* and white-mantled wainscot *Archanara neurica* are all target species. Ipswich is a key site for the stag beetle and the BAP target is to maintain the range, distribution and viability of existing stag beetle populations.	**Medium** - The project has the potential to affect terrestrial invertebrate species.	**Medium** - It is anticipated that invertebrates of medium biodiversity value may be present along the Route in a variety of habitat types.	**Slight adverse**
Great Crested Newt (GCN)	The desk study returned records of great crested newt *Triturus cristatus* within 500m of the Route. The Route is likely to result in the loss of terrestrial and breeding habitat for this species.	**County**	**High** - the Route has potential to affect terrestrial habitat and breeding ponds used by this species.	**Target species** - Nationally great crested newt have declined dramatically in the last 40 years and although still widespread across lowland England they are now uncommon. Suffolk is a major stronghold for this species with its band of boulder clay surface geology lending itself to a high density of ponds. The main Suffolk BAP targets for this species is to: 1) Maintain the range, distribution and viability of existing great crested newt populations. 2) Establish approximate population size within the county and number of breeding sites to give baseline for further restoration and management work.	**High** - GCN are of high biodiversity value on a national level.	**Minor negative** - There is the potential for the scheme to directly impact or fragment and isolate terrestrial and breeding habitat for great crested newt. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Protected plant species	Habitats present, particularly HPIs (see above) have potential to contain protected and notable plant species.	**County**	**Medium -** It is expected that protected and notable plant species populations will be primarily restricted to small areas of HPI habitat.	**Target species -** Cornflower *Centaurea cyanus*, Man orchid *Orchis anthropophor*, black poplar *Populus nigra*, Pillwort *Pilularia globulifera*, red-tipped Cudweed *Filago lutescens*, shepherd's needle *Scandix pecten-veneris*, small-flowered catchfly *Silene gallica*, spreading hedge-parsley *Torilis arvensis*, tassel stonewort *Tolypella intricata*, tower mustard *Arabis glabra* and unspotted lungwort *Pulmonaria obscura* all have archived BAPs. Man orchid, black poplar, red-tipped cudweed, small-flowered catchfly, spreading hedge-parsley, tassel stonewort and tower mustard are all in local decline. These BAPs aim to aid the recovery of these species.	**Medium** - It is anticipated that plant species of medium biodiversity value may be present along the Route in a variety of habitat types.	**Medium** - It is anticipated that plant species of medium biodiversity value may be present along the Routein a variety of habitat types.	**Slight adverse**

Other species - Species of Principal Importance (SPIs)	Common toad *Bufo bufo* may be present within waterbodies in the vicinity of the Route; low numbers of desk study records were returned for this species. Other SPIs such as brown hare *Lepus europaeus* and European hedgehog *Erinaceus europaeus* have been recorded within 500m of the Route and habitats along the Route are suitable for these species.	**County**	**Medium** - It is expected that SPIs will be present in the vicinity of the Route.	**Target species -** Suffolk BAP lists the brown hare and although their numbers fluctuate they appear to not have suffered a recent decline. Oak polypore *Piptoporus quercinus* and sandy stilt puffball *Battarrea phalloidesare* fungi which are SPIs and have archived Suffolk BAPs. Both species are rare and although oak polypore is not present in the vicinity of the Routes, the distribution of sandy stilt puffball reaches within the vicinity of the Routes.	**Medium** - The Route may result in removal and fragmentation of habitat used by SPIs which are likely to be of up to medium biodiversity value.	**Minor Negative** - The Route has potential to remove or fragment habitat used by SPIs. Further baseline required in order to develop an assessment.	**Slight adverse**

Reference Sources

WSP Desk Study (2019) obtained from Suffolk Biodiversity Information Service
Suffolk BAP, Available at: https://www.suffolkbis.org.uk/biodiversity
JNCC, protected sites, available online at: https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/
Natural England, Habitats of Principal Importance, available online at: https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england
BoCC: Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746. Available online at: https://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf
Hayhow DB, Ausden MA, Bradbury RB, Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM (2017) The State of the UK's Birds The RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire.

Summary Assessment Score

Large adverse

Qualitative Comments

The Inner Route Option is unlikely to affect European Designated sites, providing avoidance and mitigation measures are implemented. The Route is likely to directly affect three CWSs including ancient woodland habitat at Lux Wood CWS. Measures to mitigate and compensate for impacts on the CWSs and ancient woodland will be required. There may be indirect effects on additional designated sites as a result of deterioration of air quality, and increase in noise and lighting during construction and operation.

The Route will cross several HPIs including deciduous woodland. Impacts on protected species other than bats and birds was assessed as 'Slight Adverse', providing sufficient mitigation is implemented with an aim of achieving a net gain. The most significant impacts of the Route are likely to be on ancient woodland habitat, CWSs and habitats supporting or used by bats and birds. Further surveys of designated sites, habitats and species are necessary to inform an assessment of significant effects and mitigation and species licensing may be required.

TAG Biodiversity Impacts Worksheet - Middle Route (tie-in Options 2B and 2C)

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Alde-Ore and Butley Estuaries Special Area of Conservation (SAC)	Estuary complex designated for: - Annex I habitat as a primary reason for selection: Estuaries (this estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar); and - Annex I habitats present as a qualifying feature: Mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadows.	**International**	**Very high** - Habitats of international importance.	**Target habitat** - The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aim of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Special Protection Area (SPA)	Estuary complex designated for: - Internationally important breeding populations of: avocet *Recurvirostra avosetta;* lesser black-backed gull *Larus fuscus* ;Little tern *Sternula albifrons* ; marsh harrier *Circus aeruginosus* ; sandwich tern *Thalasseus sandvicensis;* - Internationally important non-breeding populations of: avocet, common redshank *Tringa totanus* and ruff *Calidris pugnax* - Internationally important assemblages of seabirds including: herring gull *Larus argentatus* , black-headed gull Larus ridibundus, lesser black-backed gull , little tern, sandwich tern; and - Internationally important waterfowl populations over winter, including: black-tailed godwit *Limosa limosa islandica* , dunlin *Calidris alpina alpina* , lapwing *Vanellus vanellus* , shoveler *Anas clypeata* , teal *Anas crecca* , wigeon *Anas penelope* , shelduck *Tadorna tadorna,* white-fronted goose *Anser albifrons albifrons* , common redshank and avocet.	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC). - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Ruff: are declining nationally and are on the Red BoCC list. - Herring gull: populations have suffered ongoing population declines nationally and are on the Red BoCC list. - Black-headed gull: is the most widely distributed seabird species breeding in the UK but is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dunlin: populations are in decline nationally and is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Ramsar site	Estuary complex designated for: - supporting a number of nationally-scarce British Red Data Book invertebrates including: starlet sea-anemone *Nematostella vectensis,* lagoon sand shrimp *Gammarus insensibilis,* ground lackey *Malacosoma castrensis,* Fancy-legged fly *Campsicnemus magius,* Chinless Thistle-cheilosia *Cheilosia velutina, Empis prodomus, Dixella attica, Hylaeus euryscapus,* swollen spire snail *Pseudamnicola confusa, Euophrys browningi, Duffy's Bell-headed Spider Baryphyma duffeyi, Haplodrassus minor* and *Trichoncus affinis* ; - supporting a number of nationally-scarce plant species including: marsh-mallow *Althaea officinalis,* sea heath *Frankenia laevis,* beach pea *Lathyrus japonicus,* Dittander *Lepidium latifolium, bur* medick *Medicago minima,* Curved Hard Grass *Parapholis incurva,* Borrer's saltmarsh-grass *Puccinellia fasciculata,* spiral tasselweed *Ruppia cirrhosa,* perennial glasswort *Sarcocornia perennis,* marsh sowthistle *Sonchus palustris, s* uffocated clover *Trifolium suffocatum,* yellow vetch *Vicia lutea* and narrow-leaved eelgrass *Zostera angustifolia* - supporting a notable assemblage of breeding and wintering birds including: marsh harrier, mediterranean gull *Larus melanocephalus,* sandwich tern, little tern, black-tailed godwit, spotted redshank *Tringa erythropus* , common greenshank *Tringa nebularia* , white-fronted goose, shelduck, wigeon, teal, pintail *Anas acuta* , shoveler. - supporting internationally important levels of: breeding lesser black-backed gull and non-breeding avocet and common redshank.	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Starlet sea-anemone: The Suffolk BAP recognises starlet sea-anemone as a priority species. All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Mediterranean gull: populations have increased nationwide. it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list. - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC) - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Deben Estuary SPA	Estuary designated for: - supporting internationally important populations of over-wintering avocet and dark-bellied brent goose, *Branta bernicla bernicla.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**

Deben Estuary Ramsar site	Estuary designated for: - supporting a population of the narrow-mouthed whorl snail, *Vertigo angustio;* - supporting non-breeding dark-bellied brent goose; - noteworthy fauna: supporting nationally important populations of: black-tailed godwit and common greenshank in spring/autumn; and over-wintering bean goose *Anser fabalis fabalis* , shelduck, avocet, spotted redshank and common redshank; and - noteworthy flora: Nationally important species occurring on the site including: marsh-mallow, slender hare's-ear *Bupleurum tenuissimum,* dittander,Borrer's Saltmarsh-grass, perennial glasswort, shrubby sea-blite *Suaeda vera* and narrow-leaved eelgrass *Zostera angustifolia.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Narrow-mouth whorl snail: is recognised as a target species under the Suffolk BAP. One of Britain's rarest snails which has suffered serious decline. A target of the BAP is to identify further sites where populations are thought to exist and enable existing populations to increase in size. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - Bean goose: populations have declined. It is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - All plant species for which the Ramsar site is designated have threatened or scarce populations within the UK.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**
Hamford Water SAC	Estuarine basin designated for: - Annex II species that are a primary reason for selection of this site: Fisher's estuarine moth *Gortyna borelii lunata* for which Hamford Water SAC is the most important site in the UK.	**International**	**Very high**	The Suffolk BAP does not identify a trend in relation to the Fisher's estuarine moth. Nationally, the Fisher's estuarine moth is very rare and has a localised distribution with known populations restricted entirely to Hamford Water and one other location in Kent.	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Hamford Water SPA	Estuarine basin designated for supporting internationally important: - breeding populations of little tern; - non-breeding populations of: avocet, golden plover, ruff, ringed plover *Charadrius hiaticula* , black-tailed godwit, dark-bellied brent goose, grey plover *Pluvialis squatarola* and teal; and - assemblages of waterfowl	**International**	**Very high**	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Golden plover: wintering populations have declined nationally and the species is on the Green BoCC list. - Ruff: populations are declining nationally and it is on the Red BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Hamford Water Ramsar site	Estuarine basin designated for supporting internationally important: - non-breeding populations of: ringed plover, common redshank, dark-bellied brent goose, black-tailed godwit, and grey plover. Additionally, noteworthy fauna and flora occurring on the site: - Breeding Mediterranean gull, black-headed gull, Little tern; and non-breeding ruff, spotted redshank, common greenshank, shelduck, teal, avocet, golden plover, knot *Calidris canutus* . - Hog's fennel *Peucedanum officinale.*	**International**	**Very high**	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Mediterranean gull: populations have increased nationwide. it is on the Amber BoCC list. - Black-headed gull: is the most widely distributed seabird species breeding in the UK but is on the Amber BoCC list. - Ruff: populations are declining nationally and it is on the Red BoCC list. - Spotted redshank: population stable but scarce wintering species in the UK and on the Amber BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Golden plover: wintering populations have declined nationally and the species is on the Green BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Hog's fennel: is a nationally rare plant species.	**Very high** - Internationally important site with limited potential for substitution	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Orfordness-Shingle Street SAC	Coastal lagoons and shingle designated for: - Annex I habitat as a primary reason for selection: coastal lagoons, annual vegetation of drift lines and perennial vegetation of stony banks.	**International**	**Very high** - Habitat of international importance.	**Target habitat** - The Suffolk BAP recognises coastal lagoons as target habitats due to their decline both nationally and locally. The primary aim of the BAP is to increase the extent of coastal lagoons to 1992 baseline levels.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Outer Thames Estuary SPA	Estuary complex designated for internationally important: - breeding populations of: common tern, *Sterna hirundo* and little tern, *Sternula albifrons;* and - non-breeding populations of: red-throated diver, *Gavia stellata.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Common tern: populations have declined. It is on the Amber BoCC list. - Red throated diver: winter populations trends are unknown and the species is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Sandlings SPA	Heathland and forest designated for: - breeding populations of: nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea.*	**International**	**Very high** - Habitats and species of international importance.	**Target species -** Both nightjar and woodlark are covered under the Suffolk BAP due to their declining populations driven by habitat loss. The BAP aims to increase these species extent and improve suitable habitat. Nightjar populations have declined nationally and it is on the Amber BoCC list. Woodlark populations have increased and it is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Staverton Park and the Thicks, Wantisden SAC	Broadleaved deciduous woodland designated for: - Annex I habitat as a primary reason for selection: old acidophilous oak woods with English oak *Quercus robur* on sandy plains.	**International**	**Very high** - Habitat of international importance.	The Suffolk BAP does not identify a trend in relation to this habitat. Old acidophilous oak woods are limited to the south and east of England following national decline.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**

Stour and Orwell Estuaries SPA	Estuaries designated for: - breeding populations of avocet; - non-breeding populations of: black-tailed godwit, dark-bellied brent goose, dunlin, grey plover, *Pluvialis squatarola,* knot, pintail; and common redshank; and - an internationally important assemblage of over-wintering waterfowl, including: cormorant *Phalacrocorax carbo* , pintail, ringed plover, grey plover, dunlin, black-tailed godwit, redshank, shelduck, great crested grebe *Podiceps cristatus* , curlew *Numenius arquata,* dark-bellied brent goose, wigeon *Anas penelope* , goldeneye *Bucephala clangula* , oystercatcher *Haematopus ostralegus* , lapwing, knot, turnstone *Arenaria interpres.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Great crested grebe: populations have increased nationally and it is on the Green BoCC list. - Curlew: populations have suffered large declines and it is on the Red BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Goldeneye: populations have increased and it is on the Amber BoCC list. - Oystercatcher: population trends are currently unknown; it is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Turnstone: populations are in decline nationally and is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries SPA is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Stour and Orwell Estuaries Ramsar site	Estuaries designated for: - supporting seven nationally scarce plant species: stiff saltmarsh-grass *Puccinellia rupestri* s; small cord-grass *Spartina maritima* ; perennial glasswort; lax-flowered sea lavender *Limonium humile* ; and the eelgrasses *Zostera angustifolia* , *Z. marina* and *Z. nolte;* - supporting five British Red Data Book invertebrates: the muscid fly *Phaonia fusca* ; the horsefly *Haematopota grandis* ; yellow-striped bear-spider *Arctosa fulvolineata* and *Duffy's Bell-headed Spider* ; and the endangered swollen spire snail *Mercuria confusa;* - supporting waterfowl assemblages of international importance; and - supporting internationally important populations of: common redshank on passage and dark-bellied brent goose, pintail, grey plover, knot, dunlin, black-tailed godwit and common redshank over winter.	**International**	**Very high** - Habitats and species of international importance.	**Target habitat -** The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aims of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition. - All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries Ramsar is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Deben Estuary Site of Special Scientific Interest (SSSI)	An estuary, overlapping with Deben Estuary SPA and Ramsar site (see above), notified for: populations of overwintering waders and wildfowl including common redshank, dark-bellied brent goose, shelduck, black-tailed godwit, wigeon, pintail, grey plover. Also present are extensive and diverse saltmarsh communities including several plants and invertebrates.	**National**	**High** - Deben Estuary is a SSSI of national importance, with internationally important numbers of overwintering common redshank and nationally important over-wintering waterfowl assemblages.	**Target habitat** - The Suffolk BAP recognises saltmarsh as a Habitat of Principal Importance (HPI) in national and local decline. The BAP aims to maintain the total extent of saltmarsh habitat, expand the current area and achieve favourable or recovering condition. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list.	**High** - Nationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the SSSI is hydrologically connected to the Route. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Little Blakenham Pit SSSI	Former chalk workings which support one of the few examples of chalk grassland flora in East Suffolk. A range of plant species are present including populations of Pyramidal Orchid *Anacamptis pyramidalis* and Bee Orchid *Ophrys apifera* and other unusual species include Man Orchid *Aceras anthropophorum* and Southern Marsh Orchid *Dactylorhiza praetermissa* . Daubenton's bat *Myotis daubentoni* , Natterer's bat *Myotis nattereri* and Brown Long-eared bat *Plecotus auritus* roost within the site with occasional Whiskered bat *Myotis mystacinus* and Brandt's bat *Myotis brandti* recorded.	**National**	**High** - Site of national importance, with a range of chalk grassland species	Target species - The Suffolk BAP identifies Lowland Calcareous Grassland as an HPI and identifies Man orchid as a priority species. Thirteen bat species are identified as priority species within the Suffolk BAP, including Daubenton's which is declining on a national scale. The Suffolk BAP aims to: 1) Maintain range of bat species across Suffolk at 2009 extent. 2) Increase coverage of bat surveys. 3) Provide training for bat workers and the general public.	**High** - Nationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Riverside House Meadow, Hasketon SSSI	Floristically rich unimproved meadow habitat with 14 grass species and 52 other plant species recorded.	**National**	**High** - Site of national importance, with a high number of grasses and herbs.	**Target habitat** - The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition	**High** - Nationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Rede Wood LNR	An area of ancient woodland inventory habitat comprised of semi-natural broadleaved woodland with English oak and ash *Fraxinus excelsior* and a hazel *Corylus avellana* understorey.	**National**	**High -** An area of ancient woodland important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High** - Nationally important habitat with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Bramford Meadows LNR	A series of floodplain meadows which are separated by a number of drainage ditches. The water in these ditches is of a high quality and supports diverse aquatic and flora species. A range of invertebrate species have also been recorded.	**County**	**Medium -** Bramford Meadows is an LNR of county importance, supporting a range of species and habitat types.	The Suffolk BAP does not identify a trend in relation to this habitat type.	**Medium** - County value sites with limited potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Blunt's Wood CWS	An area of ancient woodland inventory habitat comprised of mixed deciduous woodland with hazel coppice. The ground flora is fairly diverse though it is limited in distribution.	**National**	**High -** An area of ancient woodland important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High** - Nationally important habitat with limited potential for substitution.	**Intermediate negative -** The route passes within 50m of the ancient woodland habitat at Blunt's Wood CWS. Therefore there may be some direct impacts such as increases in noise, light and air pollutants as well as effects on root systems of trees on the edges of the woodland. Further baseline data is required to develop an assessment.	**Large adverse**

Blunt's Wood Meadow CWS	An area of grassland adjacent to Blunt's Wood CWS, containing a range of grassland species including greater burnet-saxifrage, of which there are only three other records in east Suffolk.	**County**	**Medium -** Blunts Wood Meadow is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline required in order to develop an assessment. Further baseline data is required to develop an assessment.	**Slight adverse**
Queech Wood CWS	Woodland dominated by mature ash with frequent oak and field maple and a dense scrub layer. Dog's-mercury *Mercurialis perennis* and nettle *Urtica doioica* dominate the ground flora. A number of more uncommon woodland plants are also present; wood spurge *Euphorbia amygdaloides* , sanicle *Sanicula europaea* and hairy St John's-wort *Hypericum hirsutum* .	**County**	**Medium -** Queech Wood CWS likely to be of county importance, although baseline data has not yet been obtained	**Target habitat** - Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value site with limited potential for substitution.	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline required in order to develop an assessment. Further baseline data is required to develop an assessment.	**Slight adverse**
River Gipping (Sections) CWS	The River Gipping (Sections) CWS supports a range of emergent vegetation consisting and provides suitable habitat for breeding water birds. Populations of fish including roach *Rutilus rutilus* , dace *Leuciscus leuciscus* , eel *Anguilla anguilla* , tench *Tinca tinca* , perch *Perca sp.* and pike *Esox lucius* occur in the river. The CWS is bisected by the Route.	**County**	**Medium -** A range of species are present within a potential HPI habitat, likely to be of county importance.	**Target habitat -** The River Gipping may represent River HPI habitat but baseline data is required to confirm this. The Suffolk BAP lists eel as a priority species has not produced an individual action plan and no local trend has been identified. Nationally the European eel is declining.	**Medium** - County value site with limited potential for substitution.	**Major negative** - The Route will bisect the River Gipping (Sections) CWS, resulting in potential habitat loss, habitat fragmentation and disturbance impact in addition to indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
RNR 144 CWS	Calcareous grassland flora present including Pyramidal orchids. This site is also a Roadside Nature Reserve.	**County**	**Medium** - RNR 144 CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Seckford Hall Camp Site CWS	Part of the CWS supports a diverse acid grassland community with a range of plant species present including two nationally scarce plant species: mossy stonecrop *Sedum acre* and suffocated clover.	**County**	**Medium** - Seckford Hall Camp Site CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises lowland dry acid grassland as an HPI which has declined nationally and locally. The decline in unimproved acid grassland mirrors the loss of other unimproved grassland types in Suffolk. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas.	**Medium** - County value sites with potential for substitution	**Major negative** - The Route will bisect Seckford Hall Camp Site CWS, resulting in habitat loss, habitat fragmentation and disturbance impact in addition to indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Suffolk Water Park CWS	A disused gravel pit supporting passage wading birds and over-wintering wildfowl. Thousands of black-headed and lesser black-backed gulls roost in Suffolk Water Park CWS. In addition, eight species of dragonfly have been recorded within the CWS.	**County**	**Medium** - Suffolk Water Park CWS is likely to be of county importance.	**Target habitat** - The Suffolk BAP recognises eutrophic waters as a target habitat. The BAP aims to: halt deterioration, restore ponds and ensure protection of eutrophic standing waters.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Woodbridge Old Cemetery CWS	An area of unimproved dry grassland including the nationally scarce clustered clover *Trifolium glomeratum* and meadow saxifrage *Saxifraga granulata* which is uncommon in Suffolk.	**County**	**Medium** - Woodbridge Old Cemetery CWS is likely to be of county importance.	**Target habitat** - Habitats within the CWS may represent Lowland Meadow HPI although baseline data has not been obtained. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value sites with potential for substitution	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Ancient Woodland	Ancient woodland is present within 500m of the Route at Blunts Wood which is also a CWS (see above)	**National**	**High -** Ancient woodland is important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High** - Nationally important habitat with limited potential for substitution.	**Intermediate negative -** The route passes within 50m of the ancient woodland habitat at Blunt's Wood CWS. Therefore there may be some direct impacts such as increases in noise, light and air pollutants as well as effects on root systems of trees on the edges of the woodland.Further baseline data is required to develop an assessment.	**Large adverse**
Coastal and floodplain grazing marsh HPI	The Route will bisect an area of coastal and floodplain grazing Marsh HPI	**County**	**Medium** - Coastal floodplain grazing marsh HPI is important at county level.	**Target habitat -** In decline locally and nationally. The Suffolk BAP aims to restore and re-create 200ha of grazing marsh.	**Medium** - County value habitat with limited potential for substitution	**Major negative** - The Route will bisect an area of coastal and floodplain grazing marsh HPI, removing habitat and reducing habitat connectivity. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Deciduous woodland HPI	The Route will bisect an estimated two areas of deciduous woodland HPI.	**County**	**Medium -** Deciduous woodland HPI is important at a county level.	**Target habitat** - Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect areas of deciduous woodland HPI, removing habitat and reducing habitat connectivity. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Hedgerow HPI	The Route will bisect numerous hedgerows. All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are a HPI.	**County**	**Medium -** Hedgerows are important at a county level.	**Target habitat -** The Suffolk BAP recognises hedgerows as target habitats. The aim is to ensure that most existing field boundaries are hedged, by encouraging planting along currently un-hedged boundaries.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect numerous hedgerows, removing habitat and reducing connectivity to surrounding areas. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**

Lowland dry acid grassland HPI	The Route will bisect an area of lowland dry acid grassland at Seckford Hall Camp Site CWS.	**County**	**Medium -** Lowland dry acid grassland is important at a county level.	**Target habitat -** Lowland dry acid grassland is recognised as an HPI by the Suffolk BAP which has declined nationally and locally. The decline in unimproved acid grassland mirrors the loss of other unimproved grassland types in Suffolk. The BAP aims to maintain the extent of acid grassland and seek to restore significant areas.	**Medium -** County value habitat with potential for substitution.	**Major negative** - The Route will bisect an area of lowland dry acid grassland, removing habitat and reducing habitat connectivity. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Pond HPI	The Route crosses or lies directly adjacent to an estimated one pond.	**County**	**Medium** - Pond HPI is important at a county level.	**Target habitat** - The Suffolk BAP recognises Pond HPI as a target habitat, along with other eutrophic waters. The BAP aims to: halt deterioration, restore ponds and ensure protection of eutrophic standing waters.	**Medium** - County value habitat with potential for substitution.	**Minor negative** - The Route will bisect approximately one pond, removing habitat. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Slight adverse**
River HPI	The Route bisects approximately seven watercourses which may qualify as River HPI. Further baseline data is required to calculate the presence and quantity of River HPI.	**County**	**Medium** - River HPI is important at a county level.	The Suffolk BAP does not identify a trend in relation to this habitat type.	**Medium** - County value habitat with limited potential for substitution.	**Major negative** - The Route will bisect approximately seven watercourses which may be River HPI, causing disturbance and potential disruption. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required to develop an assessment.	**Moderate adverse**
Traditional Orchard HPI	Traditional Orchard HPI is present within 500m of the Route in an estimated six locations.	**County**	**Medium** - Traditional Orchard HPI is important at a county level.	**Target habitat -** In decline nationally however not enough data is available to form an accurate trend for Suffolk's traditional orchards. BAP aims to improve one traditional orchard annually.	**Medium** - County value habitat with limited potential for substitution.	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**
Bats	Woodlands, hedgerows, mature trees and scrub are present within the Route and provide suitable habitat for foraging, commuting and roosting bats. Detailed baseline data has not yet been collected. Desk Study records of brown long-eared, pipistrelle species *Pipistrellus sp* , Daubenton's and Natterer's roosts are located within 500m of this Route. Activity records of barbastelle *Barbastella barbastellu* s and serotine *Eptesicus serotinus* have also been returned.	**Regional**	**High** - Bat species present of regional importance	**Target species** - Although a local trend in relation to the target species is not known, the Suffolk BAP identifies 13 bat species (including barbastelle). Of these: brown long-eared *Plecotus auritus* , serotine *Eptesicus serotinus* and Daubenton's *Myotis daubentonii* bats are declining on a national scale. Barbastelle are rare bats and there is insufficient data to produce a robust population trend. The Suffolk BAP aims to: 1) Maintain range of species across Suffolk at 2009 extent. 2) Increase coverage of surveys. 3) Provide training for batworkers and the general public. Bats are notably in decline across the UK due to widespread habitat loss	**High -** Habitats within the Route are likely to support foraging and roosting bats	**Intermediate Negative** - The Route will affect habitat likely to support commuting, foraging and roosting bats (including barbastelle). The Route could also have indirect impacts through habitat severance which may require extensive mitigation. Further baseline required in order to develop an assessment.	**Large adverse**
Birds	Habitats present are suitable for use by nesting birds. The arable fields and grasslands provide potential foraging habitat for passage/over-wintering birds such as flocks of thrushes, wading birds and waterfowl. Bird species with additional protection such as barn owl *Tyto alba* , have also been recorded within 500m of the Route.	**Regional**	**High** - Detailed baseline data has not yet been collected, although it is expected that, given the presence of protected sites designated for birds within 20km of the Route, habitats within the Route will support bird species at a regional level.	**Target species** - The Suffolk BAP identifies a range of bird species in significant decline on a local and national level. This includes several farmland bird species currently in decline due to changing agricultural practices and habitat loss. Barn owl, bittern *Botaurus stellaris* , bullfinch *Pyrrhula pyrrhula* , corn bunting, *Emberiza calandra,* grey partridge *Perdix perdix* , Linnet *Linaria cannabina* , nightjar, reed bunting *Emberiza schoeniclus* , skylark *Alauda Arvensis* , song thrush *Turdus philomelos* , spotted flycatcher *Muscicapa striata* , stone curlew *Burhinus oedicnemus* , tree sparrow *Passer monatnus* and turtle dove *Streptopelia turtur* are SPI and have archived BAPs in Suffolk. Bullfinch, corn bunting, grey partridge, linnet, skylark , spotted flycatcher, stone curlew and turtle dove are currently declining in Suffolk although it is not known whether these species are present in the proposed development area	**High** - The site is likely to support a diverse range of breeding and wintering bird species of local importance.	**Intermediate Negative** - The Route will result in the loss of habitats likely to be used by birds and may give rise to further impacts arising from changes in biotic conditions. Habitats within the Route could be used as supporting habitat for qualifying bird species of nearby European designated sites. Further baseline is required in order to develop an assessment, particularly on Schedule 1 birds and areas which may act as supporting habitat for birds present within nearby SPA and Ramsar sites.	**Large adverse**
Badger	Woodlands, hedgerows and grassland habitats present along the Route provide suitable habitat for foraging badgers *Meles meles* , and suitable locations for sett construction. Desk study records of badger were returned within 500m of this Route.	**County**	**Medium -** Detailed baseline data has not yet been collected. However badgers are widespread across the UK and are likely to be present	The Suffolk BAP does not identify a trend in relation to this species, although nationally badgers have shown a significant increase in numbers (c.88% since the 1980s)	**Medium** - The site is likely to support badgers likely to of value at County level. Badger setts may be present in the vicinity of the Route, especially in areas of woodland.	**Minor Negative** - The Route is likely to result in the loss of habitat used by badgers, and may affect setts, foraging and commuting habitat. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Hazel dormouse	Areas of woodland and hedgerows provide habitat suitable for hazel dormouse *Muscardinus avellanarius* . No desk study records of hazel dormouse were present within 500m but a single record was returned of the species within 2km of the Route indicating presence of the species within the landscape.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Declining both nationally and locally. Suffolk is on the edge of the hazel dormouse's UK range. Decline due to isolation of small woodlands and the intensive management of hedgerows. An objective of the Suffolk BAP is the reinstatement of hedgerows to improve connectivity between hazel dormouse sites	**High -** hazel dormouse are a species of high biodiversity value on a national level and may be present in woodlands crossed by the Route	**Minor negative** - The Route will result in removal of deciduous woodland where dormouse may be present. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Aquatic Macroinvertebrates	Watercourses and ponds are likely to support aquatic macroinvertebrates, which may include notable or protected species. White-clawed crayfish *Austropotamobius pallipes* and molluscs are discussed separately below.	**County**	**Medium** - Detailed baseline data has not yet been collected.	**Target species -** The only aquatic invertebrate targeted by the Suffolk BAP is the depressed river mussel *Pseudanodonta complanata* . The depressed river mussel is found in the River Waveney. The cause of their population decline is uncertain due to lack of data. A target of the Suffolk BAP is to encourage appropriate habitat management for this species and to determine the distribution of the Depressed River Mussel in Suffolk river catchments similar in character to the Waveney.	**Medium -** freshwater habitats along the Route may support notable aquatic macroinvertebrate species of up to medium biodiversity value.	**Minor negative** - The loss of an estimated three ponds and the crossing of an estimated eight watercourses is likely to have the largest impact. Impacts are likely to be avoidable upon the narrow-mouthed whorl snail although further baseline data is required in order to develop an assessment.	**Slight adverse**

White-clawed Crayfish	White-clawed crayfish have been recorded within Suffolk within the River Gipping which is crossed by the Route. The species may also be present within other watercourses crossed by the Route.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Once widespread across Britain. In Suffolk there a marked reduction in the range of white-clawed crayfish. The species is now classed as endangered and risks becoming locally extinct. Only three sites in Suffolk are known to contain populations of white-clawed crayfish (River Gipping, Bucklesham Mill River and a private lake near Clayton).	**Medium** - white clawed crayfish may be present in the vicinity of the Route, in areas of freshwater with populations likely to be of up tto medium biodiversity value.	**Minor negative -** The importance of watercourses in relation to white clawed crayfish is not known. There is the potential to impact fish through culverting works. Further baseline required in order to develop an assessment.	**Slight adverse**
Fish	The Route crosses several watercourses including the River Gipping which may support protected or notable fish species.	**County**	**Medium -** Detailed baseline data has not yet been collected.	Suffolk lists three species of freshwater fish as priority species (European eel *Anguilla anguilla* , river lamprey *Lampetra fluviatili* s and spined loach *Cobitis taenia*) but none of these have an individual action plan and no local trend has been identified. Nationally the European eel and river lamprey are declining and no trend has been identified for the spined loach.	**Medium** - Watercourses along the Route are likely to support fish populations of up to medium biodiversity value, which may include protected or notable species.	**Minor negative -** The importance of the minor watercourses in relation to fish is not known. There is the potential to impact fish through culverting works. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Otter	Otter *Lutra lutra* have been recorded within watercourses within 500m of the Route including the River Gipping. Watercourses crossed by the Route may provide suitable habitat for otter.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Formerly widespread but almost extinct by the 1970s. Reintroductions in the 1980s and the cessation of otter hunting has led to a strong recovery in Suffolk with an increasing population. A BAP target is to maintain and expand existing otter populations.	**High -** Otter are a species of high biodiversity value and may be present in watercourses which the Route bisects.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact otter habitat connectivity. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Water Vole	Water vole *Arvicola amphibius* have been recorded within 500m of the Route. Watercourses crossed by the Route may support water vole.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Water vole are declining locally and nationally. Water vole decline is mainly due to population fragmentation and isolation as well as predation by the American mink *Neovison vison* which is present but controlled in Suffolk. The priority target of the Suffolk BAP for this species is to halt the decline and possible extinction of water vole in Suffolk.	**Medium** - Water vole are a species of medium biodiversity value and may be present in watercourses which the Route bisects.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact water vole habitat connectivity. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Reptiles	Areas of rough grassland and scrub are likely to be suitable to support widespread reptile species such as adder *Vipera berus* , common lizard *Zootoca vivipara,* grass snake *Natrix natrix helvetica* and slow worm *Anguis fragilis* . Desk study records of common lizard, grass snake and slow worm were returned within 500m of the Route.	**County**	**Medium** - Detailed baseline data has not yet been collected	The Suffolk BAP does not identify a trend in relation to these species. Adder *Vipera berus,* grass snake, slow worm and common lizard have undergone national population declines.	**Medium** - Common reptile species are of medium biodiversity value and may be present in a variety of habitats crossed by the Route.	**Minor Negative** - The Route option is likely to affect reptiles that are present in areas of suitable habitat. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Molluscs	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior* , Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia* , have been recorded within 2km of the Route. All records of narrow-mouthed whorl snail and Desmoulin's whorl snail are restricted to within the Deben Estuary Ramsar site.	**National**	**High** - there is potential for species of national importance to be present	**Target species -** Desmoulin's whorl snail, narrow-mouthed whorl snail, little ramshorn whirlpool snail *Anisus vorticulus* and shining ram's-horn snail *Segmentina nitida* all have BAP's. Desmoulin's whorl snail, Narrow-mouth whorl snail and Shining ram's-horn snail are in decline due to the destruction of wetlands through changes in hydrological conditions, grazing pressure and physical disturbance. BAP targets for these species are to maintain viable populations and determine the extent of the species distribution.	**High** - The Route may result in disturbance to aquatic habitats which contain molluscs of up to high biodiversity value.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact aquatic habitat connectivity. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Terrestrial Invertebrates	Habitats including woodland, scrub and grassland are likely to support terrestrial invertebrates. The desk study returned records of a range of notable invertebrates within 500m of the Route and roman snail (see molluscs, above) within 2km of the Route.	**County**	**Medium** - Baseline data has not been collected but It is expected that the range of habitats along the Route will support terrestrial invertebrates that are of medium importance.	**Target species** - The Suffolk BAP identifies a declining trend in certain invertebrate species. The stag beetle *Lucanus cervus* , dingy skipper *Erynnis tages* , silver-studded blue *Plebejus argus* and white-mantled wainscot *Archanara neurica* are all target species. Ipswich is a key site for the stag beetle and the BAP target is to maintain the range, distribution and viability of existing stag beetle populations	**Medium** - It is anticipated that invertebrates of medium biodiversity value may be present along the Route in a variety of habitat types.	**Minor Negative** - The Route is likely to result in the loss of habitat used by terrestrial invertebrates. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Great Crested Newt (GCN)	The desk study returned records of great crested newt *Triturus cristatus* within 500m of the Route. The Route is likely to result in the loss of terrestrial and breeding habitat for this species.	**County**	**High** - the Route has potential to affect terrestrial habitat and breeding ponds used by this species.	**Target species** - Nationally great crested newt have declined dramatically in the last 40 years and although still widespread across lowland England they are now uncommon. Suffolk is a major stronghold for this species with its band of boulder clay surface geology lending itself to a high density of ponds. The main Suffolk BAP targets for this species is to: 1) Maintain the range, distribution and viability of existing great crested newt populations. 2) Establish approximate population size within the county and number of breeding sites to give baseline for further restoration and management work.	**High** - great crested newts are of high biodiversity value and may be present in waterbodies along the Route.	**Minor negative** - There is the potential for the scheme to directly impact or fragment and isolate terrestrial and breeding habitat for great crested newt. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Protected plant species	Habitats present, particularly HPIs (see above) have potential to contain protected and notable plant species.	**County**	**Medium -** It is expected that protected and notable plant species populations will be primarily restricted to small areas of HPI habitat.	**Target species -** Cornflower *Centaurea cyanus* , Man orchid *Orchis anthropophor* , black poplar *Populus nigra* , Pillwort *Pilularia globulifera* , red-tipped Cudweed *Filago lutescens* , shepherd's needle *Scandix pecten-veneris* , small-flowered catchfly *Silene gallica* , spreading hedge-parsley *Torilis arvensis* , tassel stonewort *Tolypella intricata* , tower mustard *Arabis glabra* and unspotted lungwort *Pulmonaria obscura* all have archived BAPs. Man orchid, black poplar, red-tipped cudweed, small-flowered catchfly, spreading hedge-parsley, tassel stonewort and tower mustard are all in local decline. These BAPs aim to aid the recovery of these species.	**Medium** - It is anticipated that plant species of medium biodiversity value may be present along the Route in a variety of habitat types.	**Minor Negative** - The Route option may affect small areas of habitat suitable for protected plant species. Further baseline data is required in order to develop an assessment.	**Slight adverse**

Other species - Species of Principal Importance (SPIs)	Common toad *Bufo bufo* may be present within waterbodies in the vicinity of the Route; low numbers of desk study records were returned for this species. Other SPIs such as brown hare *Lepus europaeus* , harvest mouse *Micromys minutus* and European hedgehog *Erinaceus europaeus* have been recorded within 500m of the Route and habitats along the Route are suitable for these species.	**County**	**Medium** - It is expected that SPIs will be present in the vicinity of the Route.	**Target species -** Suffolk BAP lists the brown hare and although their numbers fluctuate they appear to not have suffered a recent decline. Oak polypore *Piptoporus quercinus* and sandy stilt puffball *Battarrea phalloidesare* fungi which are SPIs and have archived Suffolk BAPs. Both species are rare and although oak polypore is not present in the vicinity of the Routes, the distribution of sandy stilt puffball reaches within the vicinity of the Routes.	**Medium** - The Route may result in removal and fragmentation of habitat used by SPIs which are likely to be of up to medium biodiversity value.	**Minor Negative** - The Route has potential to remove or fragment habitat used by SPIs. Further baseline data is required in order to develop an assessment.	**Slight adverse**

Reference Sources

WSP Desk Study (2019) obtained from Suffolk Biodiversity Information Service
Suffolk BAP, Available at: https://www.suffolkbis.org.uk/biodiversity
JNCC, protected sites, available online at: https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/
Natural England, Habitats of Principal Importance, available online at: https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england
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Hayhow DB, Ausden MA, Bradbury RB, Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM (2017) The State of the UK's Birds The RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire.

Summary Assessment Score

Large adverse

Qualitative Comments

The Middle Route Option is unlikely to affect European Designated sites, providing avoidance and mitigation measures are implemented. The Route is likely to directly affect three CWSs including ancient woodland habitat at Blunt's Wood CWS. Measures to mitigate and compensate for impacts on the CWSs will be required. The Route will cross several HPIs including deciduous woodland. There may be indirect effects on additional designated sites as a result of deterioration of air quality, and increase in noise and lighting during construction and operation. Impacts on protected species other than bats was assessed as 'Slight Adverse', providing sufficient mitigation is implemented with an aim of achieving a net gain. The most significant impacts of the Route are likely to be on CWSs and habitats supporting or used by bats and birds. Further surveys of designated sites, habitats and species are necessary to inform an assessment of significant effects and mitigation and species licensing may be required.

TAG Biodiversity Impacts Worksheet - Outer Route Option 1A

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Alde-Ore and Butley Estuaries Special Area of Conservation (SAC)	Estuary complex designated for: - Annex I habitat as a primary reason for selection: Estuaries (this estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar); and - Annex I habitats present as a qualifying feature: Mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadows.	**International**	**Very high** - Habitats of international importance.	**Target habitat** - The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aim of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Special Protection Area (SPA)	Estuary complex designated for: - Internationally important breeding populations of: avocet *Recurvirostra avosetta;* lesser black-backed gull *Larus fuscus* ;Little tern *Sternula albifrons* ; marsh harrier *Circus aeruginosus* ; sandwich tern *Thalasseus sandvicensis;* - Internationally important non-breeding populations of: avocet, common redshank *Tringa totanus* and ruff *Calidris pugnax* - Internationally important assemblages of seabirds including: herring gull *Larus argentatus* , black-headed gull Larus ridibundus, lesser black-backed gull , little tern, sandwich tern; and - Internationally important waterfowl populations over winter, including: black-tailed godwit *Limosa limosa islandica* , dunlin *Calidris alpina alpina* , lapwing *Vanellus vanellus* , shoveler *Anas clypeata* , teal *Anas crecca* , wigeon *Anas penelope* , shelduck *Tadorna tadorna,* white-fronted goose *Anser albifrons albifrons* , common redshank and avocet.	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC). - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Ruff: are declining nationally and are on the Red BoCC list. - Herring gull: populations have suffered ongoing population declines nationally and are on the Red BoCC list. - Black-headed gull: is the most widely distributed seabird species breeding in the UK but is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dunlin: populations are in decline nationally and is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Alde-Ore Estuary Ramsar site	Estuary complex designated for: - supporting a number of nationally-scarce British Red Data Book invertebrates including: starlet sea-anemone *Nematostella vectensis,* lagoon sand shrimp *Gammarus insensibilis,* ground lackey *Malacosoma castrensis,* Fancy-legged fly *Campsicnemus magius,* Chinless Thistle-cheilosia *Cheilosia velutina, Empis prodomus, Dixella attica, Hylaeus euryscapus,* swollen spire snail *Pseudamnicola confusa, Euophrys browningi, Duffy's Bell-headed Spider Baryphyma duffeyi, Haplodrassus minor* and *Trichoncus affinis* ; - supporting a number of nationally-scarce plant species including: marsh-mallow *Althaea officinalis,* sea heath *Frankenia laevis,* beach pea *Lathyrus japonicus,* Dittander *Lepidium latifolium, bur* medick *Medicago minima,* Curved Hard Grass *Parapholis incurva,* Borrer's saltmarsh-grass *Puccinellia fasciculata,* spiral tasselweed *Ruppia cirrhosa,* perennial glasswort *Sarcocornia perennis,* marsh sowthistle *Sonchus palustris, s* uffocated clover *Trifolium suffocatum,* yellow vetch *Vicia lutea* and narrow-leaved eelgrass *Zostera angustifolia* - supporting a notable assemblage of breeding and wintering birds including: marsh harrier, Mediterranean gull *Larus melanocephalus,* sandwich tern, little tern, black-tailed godwit, spotted redshank *Tringa erythropus* , common greenshank *Tringa nebularia* , white-fronted goose, shelduck, wigeon, teal, pintail *Anas acuta* , shoveler. - supporting internationally important levels of: breeding lesser black-backed gull and non-breeding avocet and common redshank.	**International**	**Very high** - Habitats and species of international importance.	**Target species** - All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Starlet sea-anemone: The Suffolk BAP recognises starlet sea-anemone as a priority species. - Marsh harrier: Following large historic declines, marsh harrier populations are increasing nationally and it is on the Amber BoCC list. - Mediterranean gull: populations have increased nationwide. it is on the Amber BoCC list. - Sandwich tern populations are currently stable following large-scale historic declines and the species is on the Amber BoCC list. - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Spotted redshank:population stable but scarc wintering species in the uk and on the Amber BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - White-fronted goose: populations trends are currently unknown but the species has suffered large declines and is on the Red BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Teal: populations are stable following a gradual increase and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Shoveler: populations are gradually increasing nationally and it is on the Amber BoCC list. - Lesser black-backed gull: is declining in many parts of its range and is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber list of Birds of Conservation Concern 4 (BoCC) - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts are considered likely due to the significant distance from the Route.	**Neutral**
Deben Estuary SPA	Estuary designated for: - supporting internationally important populations of over-wintering avocet and dark-bellied brent goose, *Branta bernicla bernicla.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**
Deben Estuary Ramsar site	Estuary designated for: **-** supporting a population of the narrow-mouthed whorl snail, *Vertigo angustio;* - supporting non-breeding dark-bellied brent goose; - noteworthy fauna: supporting nationally important populations of: black-tailed godwit and common greenshank in spring/autumn; and over-wintering bean goose *Anser fabalis fabalis* , shelduck, avocet, spotted redshank and common redshank; and - noteworthy flora: Nationally important species occurring on the site including: marsh-mallow, slender hare's-ear *Bupleurum tenuissimum,* dittander,Borrer's Saltmarsh-grass, perennial glasswort, shrubby sea-blite *Suaeda vera* and narrow-leaved eelgrass *Zostera angustifolia.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Narrow-mouth whorl snail: is recognised as a target species under the Suffolk BAP. One of Britain's rarest snails which has suffered serious decline. A target of the BAP is to identify further sites where populations are thought to exist and enable existing populations to increase in size. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Common greenshank: populations have slightly increased nationally and it is on the Amber BoCC list. - Bean goose: populations have declined. It is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Spotted redshank: population stable but scarce wintering species in the uk and on the Amber BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - All plant species for which the Ramsar site is designated have threatened or scarce populations within the UK.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely but the SPA is within 2km of the Route and is hydrologically connected to the route footprint so further baseline data is required in order to develop an assessment of indirect impacts.	**Neutral**
Orfordness-Shingle Street SAC	Coastal lagoons and shingle designated for: - Annex I habitat as a primary reason for selection: coastal lagoons, annual vegetation of drift lines and perennial vegetation of stony banks.	**International**	**Very high** - Habitat of international importance.	**Target habitat** - The Suffolk BAP recognises coastal lagoons as target habitats due to their decline both nationally and locally. The primary aim of the BAP is to increase the extent of coastal lagoons to 1992 baseline levels.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**

Outer Thames Estuary SPA	Estuary complex designated for internationally important: - breeding populations of: common tern, *Sterna hirundo* and little tern, *Sternula albifrons;* and - non-breeding populations of: red-throated diver, *Gavia stellata.*	**International**	**Very high** - Habitats and species of international importance.	**Target species** - Little tern: The Suffolk BAP identifies a rapidly declining trend in relation to the little tern population in Suffolk. The BAP aims to halt the decline and increase the number of potential colonies by 20 and increase the population to 350 nesting pairs by 2020. Little tern populations have declined nationally and it is on the Amber BoCC list. - Common tern: populations have declined. It is on the Amber BoCC list. - Red throated diver: winter populations trends are unknown and the species is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Sandlings SPA	Heathland and forest designated for: - breeding populations of: nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea.*	**International**	**Very high** - Habitats and species of international importance.	**Target species -** Both nightjar and woodlark are covered under the Suffolk BAP due to their declining populations driven by habitat loss. The BAP aims to increase these species extent and improve suitable habitat. Nightjar populations have declined nationally and it is on the Amber BoCC list. Woodlark populations have increased and it is on the Green BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Staverton Park and the Thicks, Wantisden SAC	Broadleaved deciduous woodland designated for: - Annex I habitat as a primary reason for selection: old acidophilous oak woods with English oak *Quercus robur* on sandy plains.	**International**	**Very high** - Habitat of international importance.	**Target habitat -** Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020. Old acidophilous oak woods are limited to the south and east of England following national decline.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Stour and Orwell Estuaries SPA	Estuaries designated for: - breeding populations of avocet; - non-breeding populations of: black-tailed godwit, dark-bellied brent goose, dunlin, grey plover, *Pluvialis squatarola,* knot *Calidris canutus,* pintail; and common redshank; and - an internationally important assemblage of over-wintering waterfowl, including: cormorant *Phalacrocorax carbo* , pintail, ringed plover *Charadrius hiaticula* , grey plover *Pluvialis squatarola* , dunlin, black-tailed godwit, redshank, shelduck, great crested grebe *Podiceps cristatus* , curlew *Numenius arquata,* dark-bellied brent goose, wigeon *Anas penelope* , goldeneye *Bucephala clangula* , oystercatcher *Haematopus ostralegus* , lapwing, knot, turnstone *Arenaria interpres.*	**International**	**Very high** - Habitats and species of international importance.	The Suffolk BAP does not identify a trend in relation to these species. - Avocet: populations are increasing nationally but the species is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Ringed plover: populations have suffered large declines and it is on the Red BoCC list. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Great crested grebe: populations have increased nationally and it is on the Green BoCC list. - Curlew: populations have suffered large declines and it is on the Red BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Goldeneye: populations have increased and it is on the Amber BoCC list. - Oystercatcher: population trends are currently unknown; it is on the Amber BoCC list. - Lapwing: populations are in decline nationally and it is on the Red BoCC list. - Turnstone: populations are in decline nationally and is on the Amber BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries SPA is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Stour and Orwell Estuaries Ramsar site	Estuaries designated for: - supporting seven nationally scarce plant species: stiff saltmarsh-grass *Puccinellia rupestri*s; small cord-grass *Spartina maritima* ; perennial glasswort; lax-flowered sea lavender *Limonium humile* ; and the eelgrasses *Zostera angustifolia* , *Z. marina* and *Z. nolte;* - supporting five British Red Data Book invertebrates: the muscid fly *Phaonia fusca* ; the horsefly *Haematopota grandis* ; yellow-striped bear-spider *Arctosa fulvolineata* and *Duffy's Bell-headed Spider* ; and the endangered swollen spire snail *Mercuria confusa;* - supporting waterfowl assemblages of international importance; and - supporting internationally important populations of: common redshank on passage and dark-bellied brent goose, pintail, grey plover, knot, dunlin, black-tailed godwit and common redshank over winter.	**International**	**Very high** - Habitats and species of international importance.	**Target habitat -** The Suffolk BAP identifies mudflats as a priority habitat with a declining trend. The aims of the BAP is to expand their extent and achieve favourable or recovering condition on mudflats currently in unfavourable condition. - All plant and invertebrate species for which the Ramsar site is designated have threatened or scarce populations within the UK. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list. - Knot: populations have declined nationally and it is on the Amber BoCC list. - Dunlin: populations are in decline nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list.	**Very high** - Internationally important site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route. However, the Stour and Orwell Estuaries Ramsar is hydrologically connected to the Route via the River Gipping where it meets the River Orwell. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Deben Estuary Site of Special Scientific Interest (SSSI)	An estuary, overlapping with Deben Estuary SPA and Ramsar site (see above), notified for: populations of overwintering waders and wildfowl including common redshank, dark-bellied brent goose, shelduck, black-tailed godwit, wigeon, pintail, grey plover. Also present are extensive and diverse saltmarsh communities including several plants and invertebrates.	**National**	**High -** Deben Estuary is a SSSI of national importance, with internationally important numbers of overwintering common redshank and nationally important over-wintering waterfowl assemblages.	**Target habitat -** The Suffolk BAP recognises saltmarsh as a Habitat of Principal Importance (HPI) in national and local decline. The BAP aims to maintain the total extent of saltmarsh habitat, expand the current area and achieve favourable or recovering condition. - Common redshank: population trends are currently unknown with both increases and declines in local populations recorded; it is on the Amber BoCC list. - Dark bellied brent goose: populations are increasing nationally and it is on the Amber BoCC list. - Shelduck: populations are gradually increasing nationally and it is on the Amber BoCC list. - Black-tailed godwit: populations are in decline and it is on the Red BoCC list. - Wigeon: populations are stable following a gradual increase and it is on the Amber BoCC list. - Pintail: populations are stable nationally and it is on the Amber BoCC list. - Grey plover: populations have declined nationally and it is on the Amber BoCC list.	**High** - Nationally important site with limited potential for substitution.	**Neutral -** no direct impacts considered likely due to the significant distance from the Route. However, the SSSI is hydrologically connected to the Route. Therefore, further baseline data is required to develop an assessment of hydrological impacts.	**Neutral**
Gosbeck Wood SSSI	Ancient coppice woodland designated for: Containing a complex mosaic of woodland stand types including wet ash-maple woodland, pedunculate oak-hazel-ash woodland and lowland hazel-pedunculate oak woodland. Ground flora including: dog's mercury *Mercurialis perennis,* tufted hair-grass *Deschampsia caespitosa* , creeping soft-grass *Holcus mollis,* Spurge Laurel *Daphne laureola,* Wood Spurge *Euphorbia amygdaloides* , herb Paris *Paris quadrifolia* and hairy woodrush *Luzula pilosa* .	**National**	**High -** Gosbeck Wood is a SSSI of national importance, with ancient coppice woodland and notable plant species.	**Target habitat -** The Suffolk BAP recognises ancient woodland as an HPI. The BAP aims to halt the loss of ancient woodland in Suffolk. Ancient woodland has undergone large scale national declines.	**High -** Nationally important site with limited potential for substitution.	**Neutral -** no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Riverside House Meadow, Hasketon SSSI	Unimproved meadow designated for: Floristically rich unimproved meadow habitat with 14 grass species and 52 other plant species recorded.	**National**	**High** - Site of national importance, with a high number of grasses and herbs.	**Target habitat -** The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition	**High -** Nationally important site with limited potential for substitution.	**Neutral -** no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Needham Lake Local Nature Reserve (LNR)	Former sand and gravel workings designated for having a diverse fauna and flora in aquatic and scrub habitats.	**County**	**Medium -** Needham Lake is an LNR of county importance, supporting a range of species and habitat types.	The Suffolk BAP does not identify a trend in relation to these species and national trends are unknown for scrub habitats.	**Medium** - County value site with potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Rede Wood LNR	An area of ancient woodland inventory habitat comprised of semi-natural broadleaved woodland with English oak and ash *Fraxinus excelsior* and a hazel *Corylus avellana* understorey.	**National**	**High -** An area of ancient woodland important at a national level.	**Target habitat -** Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High -** Nationally important habitat with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
A140 and A14 Road Verges, Roadside Nature Reserve (RNR) 143 County Wildlife Site (CWS)	A number of verges, central reservations and a roundabout forming an RNR and CWS. These small areas of species-rich grassland are colonised by a wide range of flowering plants including centaury *Centaurium erythraea* , dark mullein *Verbascum nigrum* , pyramidal orchids and wild liquorice *Astragalus glycyphyllos.*	**County**	**Medium** - Site of county value supporting plant species which are uncommon in Suffolk.	**Target habitat -** Habitats present may qualify as Lowland Meadow HPI but baseline data is required to develop an assessment. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition	**Medium** - County value site with potential for substitution.	**Major negative** - the outer Route will bisect the CWS, resulting in the loss and fragmentation of habitat and potential indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Moderate adverse**

Borley's Wood CWS	Ancient coppice woodland listed on the AWI. Species include ash, field maple *Acer campestre* , English oak, sweet chestnut *Castanea sativa* and aspen *Populus tremula* with a dense layer of hazel and hawthorn *Crataegus monogyna* forming the understorey.	**National**	**High -** An area of ancient woodland important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a habitat of principal importance. The BAPs aim halt the loss of ancient woodland in Suffolk.	**High -** Nationally important habitat with limited potential for substitution.	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Slight adverse**
Bull's Wood CWS	Ancient coppice woodland listed on the AWI. Species include ash, field maple *Acer campestre* , English oak, sweet chestnut *Castanea sativa* and aspen *Populus tremula* with a dense layer of hazel and hawthorn *Crataegus monogyna* forming the understorey.	**National**	**High -** An area of ancient woodland important at a national level.	Target habitat - Suffolk BAP recognised mixed deciduous woodland as a habitat of principal importance. The BAPs aim is to restore 27ha of deciduous woodland by 2020.	**High** - Nationally important habitat with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Coddenham Churchyard CWS	Unimproved herb-rich grassland. A wide variety of plants have been recorded here including pyramidal orchid *Anacamptis pyramidalis* , small scabious *Scabiosa columbaria* , hoary plantain *Plantago media* , burnet saxifrage *Pimpinella saxifraga* and quaking grass *Briza media*	**County**	**Medium -** Site of county value supporting a likely Habitat of Principal Importance, lowland meadow.	**Target habitat** - Habitats present may qualify as Lowland Meadow HPI but baseline data is required to develop an assessment. The Suffolk BAP recognises Lowland Meadow HPI as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition	**Medium** - County value site with potential for substitution.	**Minor Negative -** The CWS is within 200m of the Route therefore there is the potential for indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Slight adverse**
Manor Farm Meadows CWS	Four low-lying meadows separated by dense species-rich hedges supporting species characteristic of unimproved wet grassland. Creeping Jenny *Lysimachia nummularia* , yellow-rattle *Rhinanthus minor* and brown sedge *Carex disticha* occur throughout the wetter parts of the site. The drier areas support a diverse plant community including pignut *Conopodium majus* , cowslip *Primula veris* and hoary plantain.	**County**	**Medium** - Site of county value supporting a likely Habitat of Principal Importance, lowland meadow.	**Target habitat** - The Suffolk BAP recognises Lowland Meadow as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium** - County value site with potential for substitution.	**Major negative** - the outer Route will bisect Manor Farm Meadows CWS resulting in the loss and fragmentation of habitat. Further baseline data is required in order to develop an assessment.	**Moderate adverse**
Oak Wood / Broomwalk Covert CWS	Area of woodland, the majority of which is listed on the AWI. Species present include cherry Prunus avium, field maple, coppiced hazel, crab apple Malus sylvestris and small-leaved lime Tilia cordata in small quantities. A small area of Oak Wood / Broomwalk Covert CWS falls within 500m of the Route.	**County**	**Medium -** A site of county value containing ancient woodland.	**Target habitat** - Suffolk BAP recognises ancient woodland as a habitat of principal importance. The BAPs aim halt the loss of ancient woodland in Suffolk.	**Medium** - County value site with limited potential for substitution.	**Neutral** - no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Shrubland Park CWS	A park with planted mixed woodland with glades and rides. Plant species include sweet chestnut, ash and oak with wood sage *Teucrium scorodonia,* pyramidal orchid and wild basil *Clinopodium vulgare* also present. Supports a range of invertebrates including three red data book (nationally rare) species and a significant number of beetles. Desk study data indicates that this CWS may meet criteria for a SSSI due to the invertebrate species present. Therefore, in the absence of detailed baseline data, it is assumed that Shrubland Park is of National biodiversity value.	**National**	**High** - Site supporting nationally rare invertebrates and a diverse range of plants.	**Target habitat** - Suffolk BAP recognises mixed deciduous woodland as a habitats of principal importance. An aim of the BAP is to restore 27ha of deciduous woodland by 2020. The Suffolk BAP identifies a declining trend in certain invertebrate species. The stag beetle Lucanus cervus, dingy skipper Erynnis tages, silver-studded blue *Plebejus argus* and white-mantled wainscot *Archanara neuricaare* are all target species. Ipswich is a key site for the stag beetle and the BAP target is to maintain the range, distribution and viability of existing stag beetle populations.	**High** - Nationally important site with limited potential for substitution.	**Intermediate negative** - the outer Route traverses the northern extent of Shrubland Park CWS resulting in small araes of habitat loss and potential indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Large adverse**
Whitehouse Farm Meadows CWS	An area of unimproved grassland with a range of species including adder's tongue fern *Ophioglossum vulgatum* , meadow thistle *Cirsium dissectum* , southern marsh orchid *Dactylorhiza praetermissa* and twayblade *Neottia ovata* . The CWS also includes areas of newly sown grassland, scrub, hedgerows and veteran trees.	**County**	**Medium -** Site of county value supporting a likely Habitat of Principal Importance, lowland meadow.	**Target habitat** - The Suffolk BAP recognises Lowland Meadow as a target habitat due to its rapid decline since the 1940s. The BAP aims to maintain approximately 2000ha in Suffolk for 2020 and restore sites currently in unfavourable condition.	**Medium -** County value site with potential for substitution.	**Neutral -** no direct impacts considered likely due to the significant distance from the Route.	**Neutral**
Ancient Woodland	Ancient woodland is present at Gosbeck Wood which is also an SSSI, see above and within three sites which are also CWSs (see above): Coddenham Wood, Bulls Wood and Borleys Wood.	**National**	**High -** Ancient woodland is important at a national level.	**Target habitat** - Suffolk BAP recognises ancient woodland as a HPI . The BAP aims to halt the loss of ancient woodland in Suffolk.	**High -** Nationally important habitat with limited potential for substitution.	**Minor Negative** - Potential indirect impact through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Slight adverse**
Deciduous woodland HPI	The Route will bisect an estimated three areas of deciduous woodland HPI.	**County**	**Medium -** Deciduous woodland HPI is important at a county level.	**Target habitat** - Suffolk BAP recognises mixed deciduous woodland as a HPI . Deciduous woodland is declining locally. The BAP aims to restore 27ha of deciduous woodland by 2020.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect areas of deciduous woodland HPI, removing habitat and resulting in habitat loss and potential indirect impacts through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Moderate adverse**
Hedgerow HPI	The Route will bisect numerous hedgerows. All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are a HPI.	**County**	**Medium -** Hedgerow HPI is important at a county level.	**Target habitat -** The Suffolk BAP recognises hedgerows as target habitats. The aim is to ensure that most existing field boundaries are hedged, by encouraging planting along currently un-hedged boundaries.	**Medium** - County value habitat with potential for substitution.	**Major negative** - The Route will bisect numerous hedgerows, removing habitat and reducing connectivity to surrounding areas. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Moderate adverse**
Pond HPI	The Route crosses or lies directly adjacent to an estimated three ponds.	**County**	**Medium** - Pond HPI is important at a county level.	**Target habitat** - The Suffolk BAP recognises Pond HPI as a target habitat, along with other eutrophic waters. The BAP aims to: halt deterioration, restore ponds and ensure protection of eutrophic standing waters.	**Medium** - County value habitat with potential for substitution.	**Minor negative** - The Route will directly impact approximately three ponds. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Slight adverse**
River HPI	The Route bisects an estimated six watercourses which may qualify as River HPI. Further baseline data is required to calculate the presence and quantity of River HPI.	**County**	**Medium** - River HPI is important at a county level.	The Suffolk BAP does not identify a trend in relation to this habitat type	**Medium** - County value habitat with limited potential for substitution.	**Major negative** - The Route will bisect approximately six watercourses which may be River HPI, causing disturbance and potential disruption. Potential indirect impacts may also occur through changes in abiotic conditions (air quality, noise and lighting). Further baseline data is required in order to develop an assessment.	**Moderate adverse**
Traditional Orchard HPI	Traditional Orchard HPI is present within 500m of the Route.	**County**	**Medium** - Traditional Orchard HPI is important at a county level.	**Target habitat** - In decline nationally however not enough data is available to form an accurate trend for Suffolk's traditional orchards. BAP aims to improve one traditional orchard annually.	**Medium** - County value habitat with limited potential for substitution.	**Neutral** - Further baseline required in order to develop an assessment.	**Neutral**

Bats	Woodlands, hedgerows, mature trees and scrub are present within the Route and provide suitable habitat for foraging, commuting and roosting bats. Desk Study records of several bat species, including two barbastelle *Barbastella barbastellus* roosts are located within 500m of this Route.	**Regional**	**High -** Detailed baseline data has not yet been collected, although habitats present that are likely to be impacted are likely to support foraging, commuting and roosting bats at a regional level of importance.	**Target species -** Although a local trend in relation to the target species is not known, the Suffolk BAP identifies 13 bat species (including barbastelle). Of these: brown long-eared *Plecotus auritus* , serotine *Eptesicus serotinus* and Daubenton's *Myotis daubentonii* bats are declining on a national scale. Barbastelle are rare bats and there is insufficient data to produce a robust population trend. The Suffolk BAP aims to: 1) Maintain range of species across Suffolk at 2009 extent. 2) Increase coverage of surveys. 3) Provide training for batworkers and the general public. Bats are notably in decline across the UK due to widespread habitat loss	**High -** A number of barbastelle records have been returned locally. Barbastelle is an Annex II species of European importance.	**Intermediate Negative -** The Route will affect habitat likely to support commuting, foraging and roosting bats (including barbastelle). The Route could also have indirect impacts through habitat severance which may require extensive mitigation. Further baseline data is required in order to develop an assessment.	**Large adverse**
Birds	Habitats present are suitable for use by nesting birds. The arable fields and grasslands provide potential foraging habitat for passage/over-wintering birds such as flocks of thrushes, wading birds and waterfowl. Bird species with additional protection such as barn owl *Tyto alba* , have also been recorded within 500m of the Route.	**Regional**	**High -** Detailed baseline data has not yet been collected, although it is expected that, given the presence of protected sites designated for birds within 20km of the Route, habitats within the Route will support bird species at a regional level.	**Target species -** The Suffolk BAP identifies a range of bird species in significant decline on a local and national level. This includes several farmland bird species currently in decline due to changing agricultural practices and habitat loss. Barn owl, bittern *Botaurus stellaris* , bullfinch *Pyrrhula pyrrhula* , corn bunting, *Emberiza calandra,* grey partridge *Perdix perdix* , Linnet *Linaria cannabina* , nightjar, reed bunting *Emberiza schoeniclus* , skylark *Alauda Arvensis* , song thrush *Turdus philomelos* , spotted flycatcher *Muscicapa striata* , stone curlew *Burhinus oedicnemus* , tree sparrow *Passer monatnus* and turtle dove *Streptopelia turtur* are SPI and have archived BAPs in Suffolk. Bullfinch, corn bunting, grey partridge, linnet, skylark , spotted flycatcher, stone curlew and turtle dove are currently declining in Suffolk although it is not known whether these species are present in the proposed development area	**High -** The site is likely to support a diverse range of breeding and wintering bird species of local to regional importance.	**Intermediate Negative -** The Route will result in the loss of habitats likely to be used by birds and may give rise to further impacts arising from changes in biotic conditions. Habitats within the Route could be used as supporting habitat for qualifying bird species of nearby European designated sites. Further baseline data is required in order to develop an assessment., particularly on Schedule 1 birds and areas which may act as supporting habitat for birds present within nearby SPA and Ramsar sites.	**Large adverse**
Badger	Woodlands, hedgerows and grassland habitats present along the Route provide suitable habitat for foraging badgers *Meles meles* , and suitable locations for sett construction. Desk study records of badger were returned within 500m of this Route.	**County**	**Medium -** Detailed baseline data has not yet been collected. However badgers are widespread across the UK and are likely to be present	The Suffolk BAP does not identify a trend in relation to this species, although nationally badgers have shown a significant increase in numbers (c.88% since the 1980s)	**Medium -** The site is likely to support badgers likely to of value at County level. Badger setts may be present in the vicinity of the Route, especially in areas of woodland.	**Minor Negative -** The Route is likely to result in the loss of habitat used by badgers, and may affect setts, foraging and commuting habitat. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Hazel dormouse	Areas of woodland and hedgerows provide habitat suitable for hazel dormouse *Muscardinus avellanarius* . No desk study records of hazel dormouse were present within 500m but a single record was returned of the species within 2km of the Route indicating presence of the species within the landscape.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Declining both nationally and locally. Suffolk is on the edge of the hazel dormouse's UK range. Decline due to isolation of small woodlands and the intensive management of hedgerows. An objective of the Suffolk BAP is the reinstatement of hedgerows to improve connectivity between hazel dormouse sites	**High -** hazel dormouse are a species of high biodiversity value on a national level and may be present in woodlands crossed by the Route	**Minor negative** - The Route will result in removal of deciduous woodland where dormouse may be present. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Aquatic Macroinvertebrates	Watercourses and ponds are likely to support aquatic macroinvertebrates, which may include notable or protected species. White-clawed crayfish *Austropotamobius pallipe* s and molluscs are discussed separately below.	**County**	**Medium** - Detailed baseline data has not yet been collected.	**Target species -** The only aquatic invertebrate targeted by the Suffolk BAP is the depressed river mussel *Pseudanodonta complanata* . The depressed river mussel is found in the River Waveney. The species' population has declined but the cause is uncertain due to lack of data. A target of the Suffolk BAP is to encourage appropriate habitat management for this species and to determine the distribution of the Depressed River Mussel in Suffolk river catchments similar in character to the Waveney.	**Medium -** freshwater habitats along the Route may support notable aquatic macroinvertebrate species of up to medium biodiversity value.	**Minor negative** - The loss of an estimated three ponds and the crossing of an estimated eight watercourses is likely to have the largest impact. Impacts are likely to be avoidable upon the narrow-mouthed whorl snail although further baseline data is required in order to develop an assessment.	**Slight adverse**
White-clawed Crayfish	White-clawed crayfish have been recorded within Suffolk and therefore may be present within the vicinity of the Route in freshwater.	**County**	**Medium -** Detailed baseline data has not yet been collected.	**Target species** - Once widespread across Britain. In Suffolk there a marked reduction in their range. They are now classed as an endangered species and risk becoming locally extinct. Only three sites in Suffolk are known to contain populations of white-clawed crayfish (River Gipping, Bucklesham Mill River and a private lake near Clayton).	**Medium** - white clawed crayfish may be present in the vicinity of the Route, in areas of freshwater with populations likely to be of up tto medium biodiversity value.	**Minor negative -** The importance of watercourses in relation to white clawed crayfish is not known. There is the potential to impact fish through culverting works. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Fish	The Route crosses several watercourses which may support protected or notable fish species.	**County**	**Medium -** Detailed baseline data has not yet been collected.	Suffolk lists three species of freshwater fish as priority species (European eel *Anguilla anguilla* , river lamprey *Lampetra fluviatili* s and spined loach *Cobitis taenia*) but none of these have an individual action plan and no local trend has been identified. Nationally the European eel and river lamprey are declining and no trend has been identified for the spined loach.	**Medium** - Watercourses along the Route are likely to support fish populations of up to medium biodiversity value, which may include protected or notable species.	**Minor negative -** The importance of the minor watercourses in relation to fish is not known. There is the potential to impact fish through culverting works. Further baseline required in order to develop an assessment.	**Slight adverse**
Otter	Otter *Lutra lutra* have been recorded within watercourses within 500m of the Route. The watercourses crossed by the Route may provide suitable habitat for otter.	**County**	**Medium** - Detailed baseline data has not yet been collected.	**Target species** - Formerly widespread but almost extinct by the 1970s. Reintroductions in the 1980s and the cessation of otter hunting has led to a strong recovery in Suffolk with an increasing population. A BAP target is to maintain and expand existing otter populations.	**High -** Otter are a species of high biodiversity value and may be present in watercourses which the Route bisects.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact otter habitat connectivity. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Water Vole	Water vole *Arvicola amphibius* have not been recorded within 500m of the Route but records exist within 2km of the Route. Watercourses crossed by the Route may support water vole.	**County**	**Medium** - Detailed baseline data has not yet been collected	**Target species** - Water vole are declining locally and nationally. Water vole decline is mainly due to population fragmentation and isolation as well as predation by the American mink *Neovison vison* which is present but controlled in Suffolk. The priority target of the Suffolk BAP for this species is to halt the decline and possible extinction of water vole in Suffolk.	**Medium** - Water vole are a species of medium biodiversity value and may be present in watercourses which the Route bisects.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact water vole habitat connectivity or cause direct removal of burrows and foraging habitat.. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Reptiles	Areas of rough grassland and scrub are likely to be suitable to support widespread reptile species such as adder *Vipera berus* , common lizard *Zootoca vivipara* , grass snake *Natrix natrix helvetica* and slow worm *Anguis fragilis* . Desk study records of slow worm were returned within 500m of the Route.	**County**	**Medium** - Detailed baseline data has not yet been collected	The Suffolk BAP does not identify a trend in relation to these species. Adder *Vipera berus,* grass snake, slow worm and common lizard have undergone national population declines.	**Medium -** Common reptile species are of medium biodiversity value and may be present in a variety of habitats crossed by the Route.	**Minor Negative** - The Route option is likely to affect reptiles that are present in areas of suitable habitat. Further baseline required in order to develop an assessment.	**Slight adverse**
Molluscs	Watercourses and associated floodplains have potential to support rare or notable mollusc species. Narrow-mouthed whorl snail *Vertigo angustior* , Desmoulin's whorl *Vertigo moulinsiana* snail and Roman snail *Helix pomatia* , have been recorded within 2km of the Route. All records of narrow-mouthed whorl snail and Desmoulin's whorl snail are restricted to within the Deben Estuary Ramsar site.	**National**	**High -** the narrow-mouthed whorl snail is a qualifying feature of Deben Estuary Ramsar site.	**Target species -** Desmoulin's whorl snail, narrow-mouthed whorl snail, little ramshorn whirlpool snail *Anisus vorticulus* and shining ram's-horn snail *Segmentina nitida* all have BAP's. Desmoulin's whorl snail, Narrow-mouth whorl snail and Shining ram's-horn snail are in decline due to the destruction of wetlands through changes in hydrological conditions, grazing pressure and physical disturbance. BAP targets for these species are to maintain viable populations and determine the extent of the species distribution.	**High -** The Route may result in disturbance to aquatic habitats which contain molluscs of up to high biodiversity value.	**Minor Negative** - There is likely to be an increase in abiotic disturbance, notably noise and lighting on nearby watercourses. Culverts may also impact aquatic habitat connectivity. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Terrestrial Invertebrates	Habitats including woodland, scrub and grassland are likely to support terrestrial invertebrates. The desk study returned records of a range of notable invertebrates within 500m of the Route and roman snail (see molluscs, above) within 2km of the Route. A site of significant invertebrate interest, Shrubland Park CWS, will be traversed by the Route (see above).	**County**	**High** - Baseline data has not been collected but the Route traverses a site hosting nationally rare invertebrate species	**Target species** - The Suffolk BAP identifies a declining trend in certain invertebrate species. The stag beetle *Lucanus cervus* , dingy skipper *Erynnis tages* , silver-studded blue *Plebejus argus* and white-mantled wainscot *Archanara neurica* are all target species. Ipswich is a key site for the stag beetle and the BAP target is to maintain the range, distribution and viability of existing stag beetle populations	**High -** It is anticipated that invertebrates of high biodiversity value will be present within Shrubland Park CWS, traversed by the Route.	**Intermediate negative** - The Route is likely to result in the loss of small areas of habitat used by terrestrial invertebrates including Shrubland Park CWS known to host nationally rare invertebrates. Further baseline data is required in order to develop an assessment.	**Large adverse**

Great Crested Newt (GCN)	The desk study returned records of great crested newt *Triturus cristatus* within 500m of the Route. The Route is likely to result in the loss of terrestrial and breeding habitat for this species.	**County**	**High** - the Route has potential to affect terrestrial habitat and breeding ponds used by this species.	**Target species** - Nationally, great crested newt have declined dramatically in the last 40 years and although still widespread across lowland England they are now uncommon. Suffolk is a major stronghold for this species with its band of boulder clay surface geology lending itself to a high density of ponds. The main Suffolk BAP targets for this species is to: 1) Maintain the range, distribution and viability of existing great crested newt populations. 2) Establish approximate population size within the county and number of breeding sites to give baseline for further restoration and management work.	**High** - great crested newts are of high biodiversity value and may be present in waterbodies along the Route.	**Minor negative** - There is the potential for the scheme to directly impact or fragment and isolate terrestrial and breeding habitat for great crested newt. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Protected plant species	Habitats present, particularly HPIs (see above) have potential to contain protected and notable plant species.	**County**	**Medium -** It is expected that protected and notable plant species populations will be primarily restricted to small areas of HPI habitat.	**Target species -** Cornflower *Centaurea cyanus* , Man orchid *Orchis anthropophor* , black poplar *Populus nigra* , Pillwort *Pilularia globulifera* , red-tipped Cudweed *Filago lutescens* , shepherd's needle *Scandix pecten-veneris* , small-flowered catchfly *Silene gallica* , spreading hedge-parsley *Torilis arvensis* , tassel stonewort *Tolypella intricata* , tower mustard *Arabis glabra* and unspotted lungwort *Pulmonaria obscura* all have archived BAPs. Man orchid, black poplar, red-tipped cudweed, small-flowered catchfly, spreading hedge-parsley, tassel stonewort and tower mustard are all in local decline. These BAPs aim to aid the recovery of these species.	**Medium** - It is anticipated that plant species of medium biodiversity value may be present along the Route in a variety of habitat types.	**Minor Negative** - The Route option may affect small areas of habitat suitable for protected plant species. Further baseline data is required in order to develop an assessment.	**Slight adverse**
Other species - Species of Principal Importance (SPIs)	Common toad *Bufo bufo* may be present within waterbodies in the vicinity of the Route; low numbers of desk study records were returned for this species. Other SPIs such as brown hare *Lepus europaeus* , harvest mouse *Micromys minutus* and European hedgehog *Erinaceus europaeus* have been recorded within 500m of the Route and habitats along the Route are suitable for these species.	**County**	**Medium** - It is expected that SPIs will be present in the vicinity of the Route.	**Target species -** Suffolk BAP lists brown hare as a priority species. Brown hare population trends fluctuate but they appear to not have suffered a recent decline. Oak polypore *Piptoporus quercinus* and sandy stilt puffball *Battarrea phalloidesare* fungi are SPIs and have archived Suffolk BAPs. Both species are rare and although oak polypore is not present in the vicinity of the Routes, the distribution of sandy stilt puffball reaches within the vicinity of the Routes.	**Medium** - The Route may result in removal and fragmentation of habitat used by SPIs which are likely to be of up to medium biodiversity value.	**Minor Negative** - The Route has potential to remove or fragment habitat used by SPIs. Further baseline data is required in order to develop an assessment.	**Slight adverse**

Reference Sources

WSP Desk Study (2019) obtained from Suffolk Biodiversity Information Service
Suffolk BAP, Available at: https://www.suffolkbis.org.uk/biodiversity
JNCC, protected sites, available online at: https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/
Natural England, Habitats of Principal Importance, available online at: https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england
BoCC: Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746. Available online at: https://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf
Hayhow DB, Ausden MA, Bradbury RB, Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM (2017) The State of the UK's Birds The RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire.

Summary Assessment Score

Large adverse

Qualitative Comments

The Outer Route (Option 1A) is unlikely to affect European Designated sites, providing avoidance and mitigation measures are implemented. The Route is likely to directly affect three CWSs including Shrubland Park CWS which supports nationally rare invertebrates and plants. Measures to mitigate and compensate for impacts on the CWSs will be required.
The Route will cross several HPIs including deciduous woodland. There may be indirect effects on additional designated sites as a result of deterioration of air quality, and increase in noise and lighting during construction and operation. Impacts on protected species, apart from birds and bats, has been estimated at 'Slight Adverse', providing sufficient mitigation is implemented with an aim of achieving a net gain. The most significant impacts of the Route are likely to be on the CWSs and habitats supporting birds and bats. Further surveys of designated sites, habitats and species are necessary to inform an assessment of significant effects and mitigation and species licensing may be required.

Water Environment WebTAG Worksheets

TAG Water Environment Impacts Worksheet - Inner Route Option 2D

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: Up to 1km from scheme extents. **Potential Impacts:** - Impacts to water quality during construction that could pose long term or permanent effect. - Impacts to water quality associated with changes to traffic flow - Increased flood risk associated with equipment and machineries located in areas at fluvial flood risk.	**River Gipping - Main River - Flows into Orwell Estuary**	**Water supply**	High - 'Good' chemical Water Framework Directive (WFD) Status. No licensed surface water abstractions. Potential for water supply.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture, rural land management and industry, water industry and urban transport. No known European designations downstream or upstream from the crossing of the route option with the River Gipping . The River Gipping is flowing through Bramford Meadows Local Nature Reserve which is located 1.5km south of the route option.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Transport and dilution of waste	High - receives urban runoff.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Recreation	High - fishing, walking, wildlife watching and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	Medium - Commercial uses of river (watercress & fish farms). Crosses a Drinking Water Safeguard Zone.	Local	Medium	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow	High - important for managing flood risk. The Route Option may reduce the capacity and function of the fluvial floodplain and this may change the flood flow conveyance.	Regional	Medium	Limited potential for substitution. Compensation of floodplain is likely to be required.	High	Slight Adverse	Low Significance
		Flood storage	High - this route option crosses approximately 200m of the flood plain of the River Gipping which has areas classified as flood zone 2 and flood zone 3. It is anticipated to have a viaduct on 5 piers (350m span) to go over the railway line. The review of Mid Suffolk Strategic Flood Risk Assessment (2008) indicates that a majority of this flood plain is classed as the Functional Floodplain Flood Zone 3b. In accordance with the NPPF development in the functional floodplain Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere.	Regional	Medium	Limited potential for substitution. Compensation of floodplain is likely to be required.	High	Moderate Adverse	Significant
	Unnamed Ordinary Watercourses	**Water supply**	Low - no licensed surface water abstractions. Unlikely to be used for water supply.	Local	Low	Limited potential for substitution	Low	Slight Adverse	Insignificant
		Biodiversity	Low to High - majority of watercourses have no known ecological value. Watercourses in adjacent to sites of specific scientific interest and local nature reserves may support important habitats.	Local	Low to Medium	Limited potential for substitution	Low to Medium	Slight Adverse	Insignificant
		Transport and dilution of waste products	Low - unlikely to receive urban runoff.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Recreation	Low- no known recreation uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
		Value to economy	Low - no known commercial uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
		Flow conveyance	Low - unlikely to convey significant flood flow	Local	Low	Limited potential for substitution	Low	No change	Insignificant
		Flood storage	Low - the route option crosses a small section of a tributary of the River Gipping and a small section of a tributary of the River Fynn.	Local	Low	Limited potential for substitution.	Low	Slight Adverse	Insignificant

	Groundwater	**Within Source Protection Zone (SPZ) - Water supply**	Very high to high - Principal bedrock aquifer and areas SPZ1, 2 and 3 used for public water supply.	Regional	High	Cannot be substituted	High	Negligible	Insignificant
		Outside of SPZ - Water supply	High - Principal bedrock aquifer used for drinking water and agricultural uses. Route Option Crosses Drinking Water Protected Areas, Drinking Water Safeguard Zones.	Local	Low	Limited potential for substitution	Very High	Negligible	Low Significance
		Biodiversity	High - Provides baseflow to rivers.	Local	High	Cannot be substituted	High	Negligible	Insignificant

Reference Sources

Multi-Agency Geographic Information Committee (MAGIC) (www.magic.gov.uk)
WFD Data viewer http://environment.data.gov.uk/catchment-planning/
Mid Suffolk Strategic Flood Risk Assessment (2008)
Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment

Summary Assessment Score

Moderate Adverse

Qualitative Comments

The Route Option crosses one main river, the River Gipping as well as some other minor watercourses. There are also a large number of watercourses, field drains and ponds within 1km of the Route Option. Chemical quality is good in the River Gipping but the waterbody is not meeting the current ecological objectives. The reasons for not achieving good status (RANGS) relate predominantly to agriculture and rural land management and industry, water industry and urban and transport. There are surface water abstractions and parts of the scheme corridor are classified as a protected Surface Water Safeguarded Zone for water supplies. Standard measures associated with managing the quality and flow rate of surface water will mitigate the water quality impacts of the proposals.

The Route Option crosses over an unnamed watercourse that supports Sinks Valley, Kesgrave (SSSI). Sinks Valley, Kesgrave SSSI is upstream and unlikely to be affected by the Route Option. The unnamed watercourse feeds into the River Fynn which is a tributary of the Deben Estuary, a designated Ramsar, SSSI and SPA. The River Gipping flows into the Orwell estuary, which is designated as a Ramsar, SPA and SSSI. The potential impact of the Route Option on the ability of the watercourses in the surrounding area to support biodiversity is likely to be insignificant.

The Route Option crosses over the River Gipping which has commercial uses (watercress & fish farms). In addition it crosses a Drinking Water Safeguard Zone.

Surrounding areas to the Highway Route option are classified as predominantly Flood Risk Zone 1 (<0.1% annual chance of flooding) with localised areas of Flood Risk Zone 2 (0.1-1% annual chance of flooding) and Flood Risk Zone 3 (>1% annual chance of flooding) surrounding the main rivers and tributaries (low, medium and high risk of flooding respectively). This risk is associated with the fluvial flooding from the River Gipping and the unnamed watercourse that supports Sinks Valley, Kesgrave (SSSI). The Route Option is crossing a section of the River Gipping which is classed as Flood Zone 3b Functional Floodplain. In accordance with the NPPF development in Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere. This Route Option may reduce the capacity and function of the fluvial floodplain and this may increase the overall risk of flooding. The overall impact is considered to be significant.

There are water abstraction licenses from groundwater sources within the study area and a number of groundwater source protection zones. Four groundwater source protection zones run from east to west, north of the railway. The two furthest west lie south of the Route Option and the two furthest east north of it. The Route Option lies within a zone classified as a mixture of major and minor aquifers with low /intermediate / high groundwater vulnerability. Whilst groundwork's could lead to the leaching of pollutants into the groundwater, the potential impact is likely to be of low significance to groundwater resources.

TAG Water Environment Impacts Worksheet - Middle Route Options 2B and 2C

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: Up to 1km from scheme extents. **Potential Impacts:** - Impacts to water quality during construction that could pose long term or permanent effect. - Impacts to water quality associated with changes to traffic flow - Increased flood risk associated with equipment and machineries located in areas at fluvial flood risk.	**River Gipping - Main River - Flows into Orwell Estuary**	**Water supply**	High - 'Good' chemical Water Framework Directive (WFD) Status. No licensed surface water abstractions. Potential for water supply.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture, rural land management and industry, water industry and urban transport. No known European designations downstream or upstream from the crossing of the route option with the River Gipping . The River Gipping is flowing through Bramford Meadows Local Nature Reserve which is located 1.5km south of the route option.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Transport and dilution of waste	High - receives urban runoff.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Recreation	High - fishing, walking, wildlife watching and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	Medium - Commercial uses of river (watercress & fish farms)	Local	Medium	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow	High - important for managing flood risk. The Route Option may reduce the capacity and function of the fluvial floodplain and this may change the flood flow conveyance.	Regional	Medium	Limited potential for substitution. Compensation of floodplain is likely to be required.	High	Slight Adverse	Low Significance
		Flood storage	High - this route option crosses approximately 200m of the flood plain of the River Gipping which has areas classified as flood zone 2 and flood zone 3. The review of Mid Suffolk Strategic Flood Risk Assessment (2008) indicates that a majority of this flood plain is classed as the Functional Floodplain Flood Zone 3b. In accordance with the NPPF development in the functional floodplain Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere.	Regional	Medium	Limited potential for substitution. Compensation of floodplain is likely to be required.	High	Moderate Adverse	Significant
	River Fynn - Tributary to River Deben	**Water supply**	Medium - 'Good' chemical WFD status. No licensed surface water abstractions. Unlikely to be used for supply.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture and rural land management and industry. Far downstream, the River Fynn meets with the River Deben, which is a designated Ramsar, SSSI and SPA.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Transport and dilution of waste	Medium - one of the reasons for not achieving 'Good' ecological WFD status is because of diffuse sources of pollution.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Recreation	Medium - rural area. Walking, fishing and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	Medium - unconfirmed but likely commercial uses of river and the River Deben.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow	Medium - important for managing flood risk.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Flood storage	Medium - this route option crosses approximately 60m of the flood plain of the River Fynn which has areas classed as flood zone 2 and flood zone 3. The route option does not cross a Zone 3b (Functional Floodplain) according to Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment (2018).	Regional	Medium	Limited potential for substitution. Compensation of floodplain may be required.	Low	Slight Adverse	Insignificant

River Lark - Tributary to River Deben	**Water supply**	Medium - major tributary of the River Deben. 'Good' Chemical WFD status. No licensed surface water abstractions.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
	Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture and rural land management, water industry and urban and transport. Far downstream, the River Lark meets with the River Deben, which is a designated Ramsar, SSSI and SPA.	Regional	Medium	Limited potential for substitution	High	Negligible	Insignificant
	Transport and dilution of waste products	Medium - one of the reasons for not achieving 'Good' ecological WFD status is because of diffuse sources of pollution.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
	Recreation	Medium - rural area. Walking, fishing and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Value to economy	Medium - unconfirmed but likely commercial uses of the river and the River Deben.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Flow conveyance	Medium - important for managing flood risk.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
	Flood storage	Medium - this route option crosses approximately the flood plain of the River Lark, of which approximately 100m is classed as flood zone 2 and approximately 25m is classified as flood zone 3. The route option does not cross a Zone 3b (Functional Floodplain) according to Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment (2018).	Regional	Medium	Limited potential for substitution. Compensation of floodplain may be required.	Medium	Slight Adverse	Insignificant
Unnamed Ordinary Watercourses	**Water supply**	Low - no licensed surface water abstractions. Unlikely to be used for water supply.	Local	Low	Limited potential for substitution	Low	Slight Adverse	Insignificant
	Biodiversity	Low to High - majority of watercourses have no known ecological value. Watercourses in adjacent to sites of specific scientific interest and local nature reserves may support important habitats.	Local	Low to Medium	Limited potential for substitution	Low to Medium	Slight Adverse	Insignificant
	Transport and dilution of waste products	Low - unlikely to receive urban runoff.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Recreation	Low- no known recreation uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
	Value to economy	Low - no known commercial uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
	Flow conveyance	Low - unlikely to convey significant flood flow	Local	Low	Limited potential for substitution	Low	No change	Insignificant
	Groundwater	**Within Source Protection Zone (SPZ) - Water supply**	Very high to high - principal bedrock and Secondary A aquifer and areas SPZ1, 2 and 3 used for public water supply.	Regional	High	Cannot be substituted	High	Negligible	Insignificant
		Outside of SPZ - Water supply	High - Principal bedrock aquifer used for drinking water and agricultural uses. Route Option Crosses Drinking Water Protected Areas, Drinking Water Safeguard Zones.	Local	Low	Limited potential for substitution	Very High	Negligible	Low Significance
		Biodiversity	High - Provides baseflow to rivers.	Local	High	Cannot be substituted	High	Negligible	Insignificant

Reference Sources

Multi-Agency Geographic Information Committee (MAGIC) (www.magic.gov.uk)
WFD Data viewer http://environment.data.gov.uk/catchment-planning/
Mid Suffolk Strategic Flood Risk Assessment (2008)
Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment (2018)

Summary Assessment Score

Moderate Adverse

Qualitative Comments

The Route option cross three main rivers, the River Gipping, the River Lark and the River Fynn. There are also a large number of minor watercourses, field drains and ponds within 1km of the Route Option. Chemical quality is good on all three main rivers but the waterbodies are not currently meeting ecological objectives with all three attaining moderate biological status. The reasons for not achieving good status (RANGS) relate predominantly to agriculture and rural land management and industry, water industry and urban and transport. Standard measures associated with managing the quality and flow rate of surface water will mitigate the water quality impacts of the proposals.

The Route option cross over the River Fynn and River Lark, both tributaries of the Deben Estuary which is a designated Ramsar, SSSI and SPA. The River Gipping flows into the Orwell estuary, which is designated as a Ramsar, SPA and SSSI. The potential impact of the Route Option on the ability of the watercourses in the surrounding area to support biodiversity is likely to be insignificant.

The Route option crosses over the River Gipping which has commercial uses (watercress & fish farms). Although unconfirmed it is likely the River Deben also has commercial uses with Route Option crossing the River Lark, a tributary of the River Deben.

Surrounding areas to the Highway Route option are classified as predominantly Flood Risk Zone 1 (<0.1% annual chance of flooding) with localised areas of Flood Risk Zone 2 (0.1-1% annual chance of flooding) and Flood Risk Zone 3 (>1% annual chance of flooding) surrounding the main rivers and tributaries (low, medium and high risk of flooding respectively). This risk is associated with the fluvial flooding from the main rivers identified. The Route Option is crossing a section of the River Gipping which is classed as Flood Zone 3b Functional Floodplain. In accordance with the NPPF development in Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere. The Route Option may reduce the capacity and function of the fluvial floodplain and this may increase the overall risk of flooding. The overall impact is considered to be significant.

There are surface water abstractions and parts of the scheme corridor are classified as a protected Surface Water Safeguarded Zone for water supplies. There are water abstraction licenses from groundwater sources within the study area and a number of groundwater source protection zones. Four groundwater source protection zones run from east to west, north of the railway. The two furthest west lie south of the Route Options and the two furthest east north of it. The Route Option cross a Drinking Water Safeguard Zone. There are also two Groundwater Source Protection Zones to the north west of the study area, one just east of the A14, north of Claydon and one further north, just west of Shrubland Park. The Route Option lie within a zone classified as a mixture of major and minor aquifers with low / intermediate / high groundwater vulnerability. Whilst groundwork's could lead to the leaching of pollutants into the groundwater, the potential impact is likely to be of low significance to groundwater resources.

TAG Water Environment Impacts Worksheet - Outer Route Option 1A

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: Up to 1km from scheme extents. **Potential Impacts:** - Impacts to water quality during construction that could pose long term or permanent effect. - Impacts to water quality associated with changes to traffic flow - Increased flood risk associated with equipment and machineries located in areas at fluvial flood risk.	**Coddenham Watercourse- Tributary to River Gipping - Flows into Orwell Estuary**	**Water supply**	High - 'Good' chemical Water Framework Directive (WFD) Status. No licensed surface water abstractions. Potential for water supply.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture and rural land management, water industry and urban and transport. The Route Option intersects Coddenham Churchyard Manor Farm Meadows CWS and the Road Nature Reserve which is at the intersection with the A140. Both sites support Coddenham Watercourse biodiversity. The Route Option crosses Coddenham Watercourse further downstream from these two sites. A number of CWS and LNR are also along the River Gipping.	Regional	Medium	Limited potential for substitution	Medium	Slight Adverse	Low Significance
		Transport and dilution of waste	Medium - one of the reasons for not achieving 'Good' ecological WFD status is because of diffuse sources of pollution.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Recreation	Medium - walking, wildlife watching and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	Medium - Commercial uses of river (watercress & fish farms)	Local	Medium	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow	Medium - important for managing flood risk. The Route Option may reduce the capacity and function of the fluvial floodplain and this may change the flood flow conveyance.	Regional	Medium	Limited potential for substitution. Compensation of floodplain is likely to be required.	Medium	Slight Adverse	Insignificant
		Flood storage	Medium - this route option crosses approximately 50m of the flood plain of Coddenham Watercourse which has areas classified as flood zone 2 and flood zone 3. The review of Mid Suffolk Strategic Flood Risk Assessment (2008) indicates that a majority of the Flood Zone 3 is classed as the Functional Floodplain Flood Zone 3b. No development is anticipated in a flood zone. In accordance with the NPPF development in the functional floodplain Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere.	Regional	Medium	Limited potential for substitution. Compensation of floodplain may be required.	Medium	Slight Adverse	Insignificant
		Water supply	Medium - major tributary of the River Deben. 'Good' Chemical WFD status. No licensed surface water abstractions.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
		Biodiversity	Medium - 'Moderate' ecological WFD status. Reasons for not achieving 'Good' status are primarily due to agriculture and rural land management, water industry and urban and transport. Far downstream, the River Lark meets with the River Deben, which is a designated Ramsar, SSSI and SPA.	Regional	Medium	Limited potential for substitution	High	Negligible	Insignificant

River Lark - Tributary to River Deben	**Transport and dilution of waste products**	Medium - one of the reasons for not achieving 'Good' ecological WFD status is because of diffuse sources of pollution.	Regional	Medium	Limited potential for substitution	Medium	Negligible	Insignificant
	Recreation	Medium - rural area. Walking, fishing and other recreational activities.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Value to economy	Medium - unconfirmed but likely commercial uses of river and the River Deben.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Flow conveyance	Medium - important for managing flood risk. The Route Option may reduce the capacity and function of the fluvial floodplain and this may change the flood flow conveyance.	Regional	Medium	Limited potential for substitution. Compensation of floodplain may be required.	Medium	Slight Adverse	Insignificant
	Flood storage	Medium - this route option crosses two sections of the River Lark flood plain (<60m) which has areas classified as flood zone 2 and flood zone 3. The route option does not cross a Zone 3b (Functional Floodplain) according to Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment (2018).	Regional	Medium	Limited potential for substitution. Compensation of floodplain may be required.	Medium	Slight Adverse	Insignificant
Unnamed Ordinary Watercourses	**Water supply**	Low - no licensed surface water abstractions. Unlikely to be used for water supply.	Local	Low	Limited potential for substitution	Low	Slight Adverse	Insignificant
	Biodiversity	Low to High - majority of watercourses have no known ecological value. Watercourses in adjacent to sites of specific scientific interest and	Local	Low to Medium	Limited potential for substitution	Medium to Low	Slight Adverse	Insignificant
	Transport and dilution of waste products	Low - unlikely to receive urban runoff.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
	Recreation	Low- no known recreation uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
	Value to economy	Low - no known commercial uses.	Local	Low	Limited potential for substitution	Low	No change	Insignificant
	Flow conveyance	Low - unlikely to convey significant flood flow	Local	Low	Limited potential for substitution	Low	No change	Insignificant
Groundwater	**Within Source Protection Zone (SPZ) - Water supply**	Very high to high - principal bedrock aquifer and areas SPZ1, 2 and 3 used for public water supply.	Regional	High	Cannot be substituted	High	Negligible	Insignificant
	Outside of SPZ - Water supply	High - Principal bedrock aquifer used for drinking water and agricultural uses. Route Option Crosses Drinking Water Protected Areas, Drinking Water Safeguard Zones.	Local	Low	Limited potential for substitution	Very High	Negligible	Low Significance
	Biodiversity	High - Provides baseflow to rivers.	Local	High	Cannot be substituted	High	Negligible	Insignificant

Reference Sources

Multi-Agency Geographic Information Committee (MAGIC) (www.magic.gov.uk)
WFD Data viewer http://environment.data.gov.uk/catchment-planning/
Mid Suffolk Strategic Flood Risk Assessment (2008)
Suffolk Coastal and Waveney District Councils Level 1 Strategic Flood Risk Assessment (2018)

Summary Assessment Score

Slight Adverse

Qualitative Comments

The Route Option crosses two main rivers, Coddenham Watercourse and the River Lark. There are also a large number of minor watercourses, field drains and ponds within 1km of the Route Option. Chemical quality is good on both of the main rivers but the waterbodies are not currently meeting ecological objectives with the River Lark attaining moderate biological status and Coddenham Watercourse having no data (although it's ecological status is moderate. The reasons for not achieving good status (RANGS) relate predominantly to agriculture and rural land management, urban and transport and water industry. Standard measures associated with managing the quality and flow rate of surface water will mitigate the water quality impacts of the proposals.

The Route Option crosses over the Coddenham Watercourse and the River Lark. The River Lark is a tributary of the Deben Estuary which is a designated Ramsar, SSSI and SPA. The Codenham Watercourse is a tributary of the River Gipping which flows into the Orwell estuary. The Orwell Estuary is designated as a Ramsar, SPA and SSSI. Impact on the ability of the watercourses in the surrounding area to support biodiversity would be of low significance.

The Coddenham Watercourse has commercial uses (watercress & fish farms). Although unconfirmed it is likely the River Deben also has commercial uses. The Route Option crosses a Drinking Water Safeguard Zone.

Surrounding areas to the Highway Route option are classified as predominantly Flood Risk Zone 1 (<0.1% annual chance of flooding) with localised areas of Flood Risk Zone 2 (0.1-1% annual chance of flooding) and Flood Risk Zone 3 (>1% annual chance of flooding) surrounding the main rivers and tributaries (low, medium and high risk of flooding respectively). This risk is associated with the fluvial flooding from the main rivers identified. The Route Option is crossing a small section of the Coddenham Watercourse which is classed as Flood Zone 3b Functional Floodplain. In accordance with the NPPF development in Flood Zone 3b is not permitted. Whilst there is often some deviation from this requirement for road schemes there must be demonstration that the scheme has limited works in the floodplain as much as economically viable; and that the scheme as a whole does not interrupt flood flow conveyance or flood storage to such an extent that it would increase flood risk to people, property and infrastructure elsewhere. The Route Option may reduce the capacity and function of the fluvial floodplain and this may increase the overall risk of flooding. However, given the small section of the Coddenham Watercourse being crossed, the overall impact is considered to be of Low Significance.

Parts of the scheme corridor are classified as a protected Surface Water Safeguarded Zone for water supplies. There are water abstraction licenses from groundwater sources within the study area and a number of groundwater source protection zones. Two groundwater source protection zones lie to the north west of the study area, one just east of the A14, north of Claydon and one further north, just west of Shrubland Park. The Route Option lies within a zone classified as a mixture of major and minor aquifers with low / intermediate / high groundwater vulnerability. Whilst groundwork's could lead to the leaching of pollutants into the groundwater, the potential impact is likely to be of low significance to groundwater resources.

Appendix C

AIR QUALITY MEMO

MEMO

TO	Suffolk County Council	**FROM**	Jorge Gomez Perales, Air Quality Team
DATE	**January 2020**	**CONFIDENTIALITY**	Public
SUBJECT	**Ipswich Norther Route- Air Quality (Environmental Appraisal)**		

Introduction

WSP has been appointed to undertake a qualitative Environmental Appraisal in terms of air quality for a proposed Highway Route north of Ipswich, known as Ipswich Northern Route (INR).

This qualitative appraisal considers the likely constrains, risks, impacts and opportunities in terms of local air quality around the proposed route options. The outcomes of this appraisal are qualitative and based on the information available at the time of this assessment.

Methodology

A qualitative assessment of the scheme options has been undertaken follow the methodologies and criteria set out within DMRB – Volume 11 Section 3 Part 1 - HA 207/07 – Air Quality for a "Scoping" level study[1], and the guidance within WebTAG unit A3 'Environmental Impact Appraisal'[2].

A qualitative review of the traffic data provided by WSP Transport Team was carried out for three corridors and four options as listed below:

- Outer Route- Option 1A;
- Middle Route- Options 2B and 2C; and
- Inner Route – Option 2D.

Traffic data used for this qualitative assessment is presented in **Appendix A**. Traffic data for the opening year of 2027 was provided as Annual Average Daily Traffic (AADT) flows, Heavy Duty Vehicle (HDV) flows, average vehicle speeds (km/hr) for the three corridors and four options for the Do- Something scenarios.

The following data and information was used for this qualitative assessment:

- Local Authority review and assessment reports[3,4,5];
- Defra's national Pollution Climate Mapping (PCM) modelled pollutant concentrations[6];
- Address point data base to identify sensitive receptors using GIS (see **Appendix B**); and
- MAGIC maps to identify designated sites[7];

[1] The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) DMRB Guidance Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques. Part 1 HA 207/07 Air Quality
[2] Department for Transport (2019) TAG UNIT A3 – Environmental Impact Appraisal.
[3] Suffolk Costal and Waveney District Council (2018) 2018 Air Quality Annual Status Report (ASR).
[4] Ipswich Borough Council (2018) 2018 Air Quality Annual Status Report (ASR).
[5] Babergh and Mid Suffolk District Council (2018) 2018 Air Quality Annual Status Report (ASR).
[6] https://uk-air.defra.gov.uk/data/pcm-data
[7] https://magic.defra.gov.uk/

Qualitative Assessment

Outer Route (Option 1A)

- 147 sensitive receptors include residential areas and two hotels within 200m of the Highway Route option and the junctions with the A12- (Woodbridge);
- One ecological receptor, Borley Wood, an Ancient Woodland, was identified within 200m of the Highway Route option;
- Traffic flows will exceed the DMRB criteria[8] for total AADT, HDV, vehicle speeds along the Highway Route option, and junctions with the A14 and the A12, north and east of Woodbridge;
- Changes in traffic flows, i.e. increases/decreases, are likely to affect the Air Quality Management Area (AQMA) in Woodbridge, which includes an area encompassing a number of properties near to the junction of Lime Kiln Quay Road, Thoroughfare and St John's Street in Woodbridge;
- No monitoring data is available along the Highway Route option. The closest Suffolk Coastal District Council (SCDC) monitoring site is approximately 1.2km to the east of the A12 junction. The annual mean NO_2 concentrations measured in 2017 in this area was 26µg/m^3 at roadside locations.
- No Defra PCM links were identified within this route.

Middle Route (Option 2B and 2C)

- 302 sensitive receptors include residential, schools, hotels and a care home within 200m of the Highway Route option, predominantly along in the A14, at the Claydon junction and the A12 Woodbridge (option 2B and 2C). Other areas include Witnesham;
- One ecological receptor, Blunts Wood, an Ancient Woodland, was identified within 200m of the Highway Route option;
- Traffic flows will exceed the DMRB[8] criteria for total AADT, HDV and vehicle speeds along the Highway Route option and the junctions with the A14, South of Claydon, and the A12, east of Woodbridge;
- Changes, i.e. increases/decreases, in traffic flows are likely to affect the AQMA in Woodbridge;
- No monitoring data is available along the Highway Route option. The closest SCDC monitoring site at roadside locations is approximately 1.6km to the east of the A12 junction within the AQMA in Woodbridge. The maximum annual mean NO2 concentrations in 2017 in this area was 37µg/m^3;
- No Defra PCM links were identified within this route.

Inner Route (Option 2D)

- 76 sensitive receptors include residential, schools, a hotel and a care home within 200m of the Highway Route option, predominantly in the A14, Claydon junction, north of Kesgrave in Playford Road and the junction of the A12/ A1214 east of Kesgrave and west of Martlesham;
- Two ecological receptors, Sinks Valley, Kesgrave, a Site of Special Scientific Interest, and Lux Wood, an Ancient Woodland, were identified within 200m of the Highway Route option;
- Traffic flows will exceed the DMRB criteria[8] for AADT, HDV, vehicle speeds along the Highway Route option, and near to the A14 junctions, South of Claydon, A12/A1214 junction east of Kesgrave and west of Martlesham;
- No monitoring data is available along the Highway Route option. There are a number of SCDC monitoring sites at roadside locations approximately within 2.5km to the south and south east of the Highway Route option and the junction with the A12/A1214. In 2017, the maximum annual mean NO_2 concentrations in this area was 35 µg/m^3 at Kesgrave.
- A Defra PCM link was identified as the A1214, Main Road, which leads to the junction with the A12 and the Inner Route. The expected NO_2 concentrations in this PCM link is 26.3µg/m^3 in 2017.

[8] DMRB Affected Road Criteria: Road alignment will change by 5 m or more; or daily traffic flows will change by 1,000 AADT or more; or Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or daily average speed will change by 10 km/hr or more.

Summary of Results

Table 1 summarises indicative results using a score based expert judgment applied to each Highway route option. The score system is using info available as part of the qualitative assessment, traffic data and receptors within 200m of the Highway Route options. **Table 1** also shows a ranking where "1" is expected to have the lowest impact and "4" the highest. The results show the Middle Route Option "2C" has the lowest ranking and "2B" the highest.

Table 1: Comparison of the Route Options based on AADT flows and number of receptors

Highway Route Option	Average AADT flows (Two-Way) All links per Route	Receptors within 200m	Score	Ranking
Outer Route- 1A	13,985	147	2,055,722	3
Middle Route- 2B	18,971	234	4,439,247	4
Middle Route- 2C	16,930	68	1,151,211	1
Inner Route-2D	24,468	76	1,859,540	2

Note:

- This is an indicate score only based on average 24hr AADT flows (two-way) and number of receptors within 200m to generate a score for each route.
- Preliminary scores have not taken into account changes in traffic over the wider network.
- Route alignments have been used for the calculation only. There is no 24hr AADT data to determine the affected road network for each route option over the wider road network.
- No pollutant, emissions or concentrations, have been taken into account for this calculation.
- Receptors were taken into account within 200m from indicative route alignments.
- Routes alignments provided available for this qualitative assessment are indicative and not accurate.

Conclusions, Limitations and Recommendations

Sensitive receptors in terms of local air quality were identified within 200m the Highway Route options and in the areas around the junctions with the A14 and the A12. The Highway Route options 'Middle Route' and 'Option 2B' were identified as having the maximum number of the sensitive receptors likely to be affected in terms of local air quality.

Baseline conditions for the Highway Route options show that concentrations are likely to be below the annual mean NO_2 objective. The maximum NO_2 annual mean concentration, of 35µg/m^3, near the Highway Route options was identified at Kesgrave. The Highway Route options do not lie within any AQMAs. The nearest AQMA at Woodbridge and Ipswich town could experience positive and negative effects associated with all of the Highway Route options.

The Highway Route options are likely to have impacts in terms of local air quality along the junctions with the A12 and A14. The greatest impacts in terms of local air quality are likely to be along the junctions with the A12. This conclusion is based on the likely changes of traffic data within the Highway Route options, the number of sensitive receptors located in the vicinity of the proposed junctions along the A12 and the results from the closest Suffolk Costal District Council air quality monitoring stations to the A12. The Highway Route options are also expected to reduce congestion and queuing thereby reducing vehicle emissions and improving air quality.

Overall the Highway Route options, excluding impacts in the wider road network, are likely to create negative and positive changes in terms of local air quality and unlikely to be significant. The overall potential impact on air quality is considered to be Slight Adverse.

Traffic data provided for this qualitative air quality assessment was provided in the correct format as specified in DMRB guidance for the Highway Route options only. However, it was not possible to determine if changes in traffic flows and charateristics will meet the DMRB criteria for “Scoping” level study across the wider road network.

A quantitative assessment using dispersion modelling is recommended to understand the scale and magnitude of air quality impacts for the Highway Route options, as well as a quantitative WebTag appraisal.

Air quality monitoring at roadside locations along the A14 in the proposed areas of the Highway Route options is not available from local authorities. Therefore, it is recommended that air quality monitoring is undertaken for a minimum of three months in these areas to understand the current situation in terms of local air quality.

Appendix A: Highway Route Options, Traffic Data- 2027

Outer Route
Option 1A

			24HR AADT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	A140	Henley Road	8327	93	4%
	Henley Road	B1077	7188	91	5%
	B1077	B1079	5982	92	5%
	B1079	A12 (Junction A)	5549	102	5%
Westbound	A12 (Junction A)	B1079	6237	96	6%
	B1079	B1077	6690	92	5%
	B1077	Henley Road	7748	91	5%
	Henley Road	A140	8217	101	4%

Middle Route
Option 2B

			24HR AADT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	10643	101	2%
	Paper Mill Lane overbridge	Henley Road	10643	91	2%
	Henley Road	B1077	9324	89	5%
	B1077	Clopton Rd	8097	84	5%
	Clopton Rd	Grundisburgh Rd	8466	86	5%
	Grundisburgh Rd	Hall Farm Road, Great Bealings	8977	88	4%
	Hall Farm Road, Great Bealings	A12 (Junction B)	9084	101	5%
Westbound	A12 (Junction B)	Hall Farm Road, Great Bealings	9859	83	4%
	Hall Farm Road, Great Bealings	Grundisburgh Rd	9736	88	4%
	Grundisburgh Rd	Clopton Rd	8506	86	4%
	Clopton Rd	B1077	8507	84	5%
	B1077	Henley Road	9396	88	5%
	Henley Road	Paper Mill Lane overbridge	10780	101	5%
	Paper Mill Lane overbridge	Bramford Road	10780	101	5%

Middle Route
Option 2C

			24HR AADT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	10334	101	3%
	Paper Mill Lane overbridge	Henley Road	10334	91	3%
	Henley Road	B1077	8999	89	6%
	B1077	Clopton Rd	7720	85	6%
	Clopton Rd	Grundisburgh Rd	7819	86	5%
	Grundisburgh Rd	Hall Farm Road, Great Bealings	6844	89	5%
	Hall Farm Road, Great Bealings	A12 (Junction C)	4213	101	8%
Westbound	A12 (Junction C)	Hall Farm Road, Great Bealings	4538	86	7%
	Hall Farm Road, Great Bealings	Grundisburgh Rd	8439	87	4%
	Grundisburgh Rd	Clopton Rd	8764	86	4%
	Clopton Rd	B1077	8882	83	5%
	B1077	Henley Road	9791	88	5%
	Henley Road	Paper Mill Lane overbridge	10915	101	5%
	Paper Mill Lane overbridge	Bramford Road	10915	101	5%

Inner Route
Option 2D

			24HR AADT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	11720	101	7%
	Paper Mill Lane overbridge	Henley Road	11720	90	7%
	Henley Road	Westerfield Rd (B1077)	10523	85	7%
	Westerfield Rd (B1077)	Main Road	10441	78	7%
	Main Road	Playford Rd	12367	93	6%
	Playford Rd	Hall Road	16080	45	5%
	Hall Road	Intermediate Point	14934	100	5%
	Intermediate Point	A12 (Junction D)	14934	100	5%
Westbound	A12 (Junction D)	Intermediate Point	12478	101	3%
	Intermediate Point	Hall Road	12478	76	3%
	Hall Road	Playford Road	13246	48	3%
	Playford Road	Main Road	11873	93	4%
	Main Road	Westerfield Road (B1077)	10294	80	5%
	Westerfield Road (B1077)	Henley Road	10265	85	5%
	Henley Road	Paper Mill Lane overbridge	11194	101	5%
	Paper Mill Lane overbridge	Bramford Road	11194	101	5%

Appendix B: Sensitive Receptors

Sensitive receptors within 200m from each side of the Highway Route options are presented below.

Receptors	**Outer Route, (Option 1A)**
No. of Residential Buildings	145
No. of Schools	0
No. of Care Homes	0
No. of Hotels	2

Receptors	**Middle Route (Option 2B)**
No. of Residential Buildings	229
No. of Schools	2
No. of Care Homes	1
No. of Hotels	2

Receptors	**Middle Route (Option 2C)**
No. of Residential Buildings	64
No. of Schools	1
No. of Care Homes	1
No. of Hotels	2

Receptors	**Inner Route, (Option 2D)**
No. of Residential Buildings	73
No. of Schools	1
No. of Care Homes	1
No. of Hotels	1

Date Modified: 12/09/2019

Drawn By: JGP

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The study area for air quality is a 200m buffer from the centreline of each highway route option.

Legend

- Corridor of Outer Route
- Corridor of Middle Route
- Corridor of Inner Route
- Air Quality Management Area (2017)
- Site of Special Scientific Interest
- Ancient Woodland
- Sensitive Human Receptors
- Suffolk Costal DC AQ monitoring
- Ipwich BC AQ Monitoring

Defra PCM 2017 NO_2 (µg/m^3)

- >60
- 50-60
- 40-50
- 30-40
- 20-30
- 10-20
- <10

0 0.375 0.75 1.5 2.25 3 Kilometres

wsp

TITLE:

INR -Air Quality Study Area
Environmental Appraisal
Qualitative Asssessment

FIGURE No:

FIGURE 1

Date Modified: 12/09/2019

Drawn By: JGP

File: \\uk.wspgroup.com\Central Data\Projects\700442xx\70044285 - Ipswich Northern Routes SOBC\02 WIP\Disciplines WiP\AQ Air Quality\03.GIS

Legend

- Corridor of Outer Route
- Corridor of Middle Route
- Site of Special Scientific Interest
- Ancient Woodland
- Air Quality Management Area (2017)
- Sensitive Human Receptors

Defra PCM 2017 NO_2 (µg/m^3)

- >60
- 50-60
- 40-50
- 30-40
- 20-30
- 10-20
- <10

The study area for air quality is a 200m buffer from the centreline of each highway route option.

0 0.075 0.15 0.3 0.45 0.6 Kilometres

wsp

TITLE: INR -Air Quality Study Area
AQMA-Woodbridge
Environmental Appraisal
Qualitative Asssessment

FIGURE No:

FIGURE 2

Appendix D

NOISE MEMO

MEMO

TO	Suffolk County Council	**FROM**	Esteban Olmos
DATE	**January 2020**	**CONFIDENTIALITY**	**Public**
SUBJECT	**Ipswich Northern Route – Environmental Appraisal - Noise**		

Introduction

SCC has commissioned WSP to undertake an environmental appraisal of four options which have emerged from the Options Assessment Report. A qualitative assessment has been prepared to support the development of the Strategic Outline Business Case (SOBC) to seek funding for the Ipswich Northern Route (INR) scheme. This environmental appraisal presents a qualitative assessment related to noise.

Methodology

The study has been based upon Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 - HD 213/11 – Noise and Vibration. At this stage, the study area includes sensitive receptors likely to experience noise impacts at locations up to 600m of the Highway Route options. The study area of 600m has been based on DMRB HD 213/11.

The options assessed qualitatively are:

- Outer route – Option 1A;
- Middle route – Option 2B and 2C; and
- Inner route – Option 2D

Traffic data used in this assessment was prepared by the WSP Transport team and the format follows the requirements in the 'Calculation of Road Traffic Noise (CRTN), 1988, and DMRB HD 213/11. Traffic data used in this assessment is presented in Appendix A.

Preliminary Basic Noise Level (BNL) calculations have been undertaken to advise on likely number of properties exceeding a noise level $L_{A10,18h}$ 68dB used as the Significant Observed Adverse Effect Level (SOAEL)[1] and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988.

Qualitative Assessment

The Highway Route options footprint do not fall within any Defra Noise Important Areas (NIAs), locations where the 1% of the population are affected by the highest noise levels from major roads according to the results of Defra's strategic noise maps[2]. However, the Highway Route options are adjacent to several NIAs located on the A12 and the A14, and may have some indirect impacts on these NIAs. The NIAs located within a study area of 600m are shown in **Appendix B**

[1] DEFRA (March 2010) Noise Policy Statement for England.
[2] Noise Action Plan: Roads (Including Major Roads) Noise Action Plan, Defra 2014

Outer Route – Option 1A

NIA 11332 (located along the A140, west of Coddenham) and NIA 4810 (located along the A12, east of Woodbridge) are within 600m from the alignment of the Outer Route.

A study area of 600m from the route option is likely to include 1452 dwellings. Most of noise sensitive receptors will be concentrated to the eastern edge of the route. Receptor areas within close proximity to the Highway Route option are likely to experience a perceptible change in noise levels.

Approximately 24 noise sensitive receptors within 60m from the proposed route are likely to exceed a noise level of 68 dB $L_{A10,18h,}$ used as the Significant Observed Adverse Effect Level (SOAEL)[3] and the threshold for the Noise Insulation Regulations (NIR) 1975, as amended 1988. The Highway Route option is likely to have Slight Adverse effects on noise.

Middle Route – Options 2B and 2C

The following NIAs are located within 600m from the route options:

- NIA 4822 (located along the A14, south of Claydon) within 600m from the alignment of Option 2B and Option 2C;
- NIA 4807 (located along the A12, east of great Bealings) and NIA 4808 within 600m from the alignment of Option 2B;
- NIA 4806 (located along the A12, east of great Bealings) within 600m from the alignment of Option 2C.

A study area of 600m from the route is likely to include 1807 dwellings from Option 2B (ie. tie-in to A12) and 899 dwellings from Option 2C (i.e. tie-in to roundabout joining B1438). Most of noise sensitive receptors will be concentrated in Woodbridge and Witnesham. These and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels.

Approximately 46 noise sensitive receptors within 80m from the proposed route are likely to exceed a noise level of 68 dB $L_{A10,18h,}$ used as the SOAEL and the threshold for the NIR 1975, as amended 1988. The Highway Route options are likely to have Slight Adverse effects on noise.

Inner Route – Option 2D

NIA 4822 (located along the A14, west of Akenham) is located within 600m of this route.

A study area of 600m from the route is likely to include 1381 dwellings. Most of noise sensitive receptors will be concentrated west of Martlesham and to the western edge of the route. These and low density populated areas within close proximity to the route are likely to experience a perceptible change in noise levels.

[3] DEFRA (March 2010) Noise Policy Statement for England.

Approximately 12 noise sensitive receptors within 100m from the proposed route are likely to exceed a noise level of 68 dB $L_{A10,18h,}$ used as the SOAEL and the threshold for the NIR 1975, as amended 1988. The Highway Route option is likely to have Slight Adverse effects on noise.

Conclusions

A qualitative assessment has been undertaken to determine the constraints on noise related to the Highway Route options. This should be considered as preliminary assessment to indicate the likely risks associated to noise.

NIAs and the number of noise sensitive receptors have been identified for each Highway Route option. The Middle Route Option 2B was identified as having the highest number of dwellings within 600m from the alignment. The Middle Route Option 2C was identified as having the lowest number of dwelling within 600m from the alignment. The Middle Route options and the Outer Route option were identified as having the highest number of sensitive receptors likely to be affected in terms of noise level change.

A perceptible noise level change is likely to arise from all options at receptor near the route. Noise levels are likely to exceed the SOAEL and NIR absolute noise level threshold at properties within 60m to 100m from the Highway Route options. Overall, the Highway Route options are likely to have Slight Adverse impacts on noise.

A quantitative assessment using noise modelling should be undertaken to understand the likely noise impact. Noise survey for up to one week and noise modelling should be carried out to establish the baseline conditions and the magnitude of impact arising from the operation of the INR scheme.

A noise mitigation strategy should be developed, if required, to minimise any likely significant noise effects. Noise mitigation could be included in the form of noise barrier, earth-bund, cutting or low noise road surface.

Appendix A: Traffic Data

Outer Route – Option 1A

			18HR AAWT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	A140	Henley Road	8499	93	4%
	Henley Road	B1077	7438	91	5%
	B1077	B1079	6145	92	5%
	B1079	A12 (Junction A)	5701	102	5%
Westbound	A12 (Junction A)	B1079		96	6%
	B1079	B1077	6320	92	5%
	B1077	Henley Road	6856	91	5%
	Henley Road	A140	7975	101	4%

Middle Route – Option 2B

			18HR AAWT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	11094	101	2%
	Paper Mill Lane overbridge	Henley Road	11094	91	2%
	Henley Road	B1077	9795	89	5%
	B1077	Clopton Rd	8470	84	5%
	Clopton Rd	Grundisburgh Rd	8822	86	5%
	Grundisburgh Rd	Hall Farm Road, Great Bealings	9289	88	4%
	Hall Farm Road, Great Bealings	A12 (Junction B)	9421	101	5%
Westbound	A12 (Junction B)	Hall Farm Road, Great Bealings		83	4%
	Hall Farm Road, Great Bealings	Grundisburgh Rd	10199	88	4%
	Grundisburgh Rd	Clopton Rd	10013	86	4%
	Clopton Rd	B1077	8807	84	5%
	B1077	Henley Road	8883	88	5%
	Henley Road	Paper Mill Lane overbridge	9794	101	5%
	Paper Mill Lane overbridge	Bramford Road	11261	101	5%

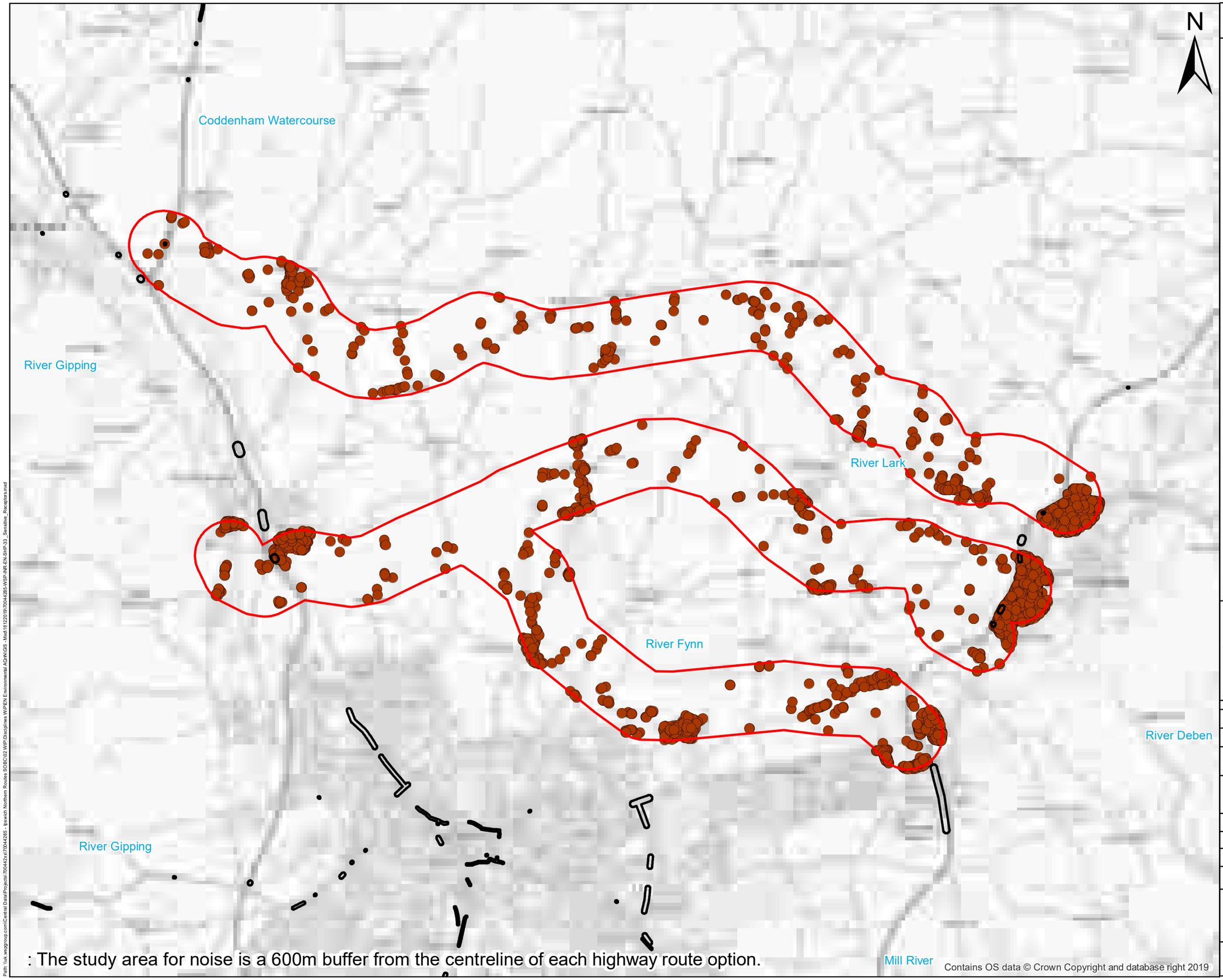
Middle Route - Option 2C

			18HR AAWT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	10749	101	3%
	Paper Mill Lane overbridge	Henley Road	10749	91	3%
	Henley Road	B1077	9435	89	6%
	B1077	Clopton Rd	8050	85	6%
	Clopton Rd	Grundisburgh Rd	8099	86	5%
	Grundisburgh Rd	Hall Farm Road, Great Bealings	7104	89	5%
	Hall Farm Road, Great Bealings	A12 (Junction C)	4386	101	8%
Westbound	A12 (Junction C)	Hall Farm Road, Great Bealings		86	7%
	Hall Farm Road, Great Bealings	Grundisburgh Rd	4618	87	4%
	Grundisburgh Rd	Clopton Rd	8719	86	4%
	Clopton Rd	B1077	9050	83	5%
	B1077	Henley Road	9250	88	5%
	Henley Road	Paper Mill Lane overbridge	10183	101	5%
	Paper Mill Lane overbridge	Bramford Road	11397	101	5%

Inner Route – Option 2D

			18HR AAWT		
	From	**To**	**TOTAL**	**SPEED (kph)**	**%HGV**
Eastbound	Bramford Road	Paper Mill Lane overbridge	12042	101	7%
	Paper Mill Lane overbridge	Henley Road	12042	90	7%
	Henley Road	Westerfield Rd (B1077)	10814	85	7%
	Westerfield Rd (B1077)	Main Road	10646	78	7%
	Main Road	Playford Rd	12467	93	6%
	Playford Rd	Hall Road	16112	45	5%
	Hall Road	Intermediate Point	14999	100	5%
	Intermediate Point	A12 (Junction D)	14999	100	5%
Westbound	A12 (Junction D)	Intermediate Point		101	3%
	Intermediate Point	Hall Road	12387	76	3%
	Hall Road	Playford Road	12387	48	3%
	Playford Road	Main Road	13171	93	4%
	Main Road	Westerfield Road (B1077)	12022	80	5%
	Westerfield Road (B1077)	Henley Road	10536	85	5%
	Henley Road	Paper Mill Lane overbridge	10530	101	5%
	Paper Mill Lane overbridge	Bramford Road	11560	101	5%

Appendix B Sensitive receptors



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Notes

- Noise Action Planning Important Areas (NIA)
- Residential Buildings
- Outer Route (Option 1A)
- Middle Route (Option 2B and 2C)
- Inner Route (Option 2D)

Revision Details	By / Check	Date	Suffix
		16/12/2019	AH

Drawing Status: FINAL

Job Title: GREATER IPSWICH NORTHERN TRANSPORT STUDY

Drawing Title: FIGURE 1- NOISE STUDY AREA AND SENSITIVE RECEPTORS

Scale at A3: 1:60,000

Drawn: AH

Stage 1 check	Stage 2 check	Originated	Date
AK	CB	EM	16/12/2019

0 2
Kilometres

Drawing Number: 70044285-WSP-INR-TP-DWG-022

Rev: P01

Appendix E

HISTORIC ENVIRONMENT REPORT

Suffolk County Council

IPSWICH NORTHERN ROUTE

Strategic Outline Business Case WebTag Worksheets: Designated Heritage Assets

Suffolk **County Council**

IPSWICH NORTHERN ROUTE

Strategic Outline Business Case WebTag Worksheets: Designated Heritage Assets

PROJECT NO. 70044285

OUR REF. NO. 70044285-E01

DATE: SEPTEMBER 2019

Suffolk **County Council**

IPSWICH NORTHERN ROUTE

Strategic Outline Business Case WebTag Worksheets: Designated Heritage Assets

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CONTENTS

TABLES

APPENDICES

FIGURES in Appendix C

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. WSP has been commissioned by Suffolk County Council to carry out an assessment of heritage constraints for the three proposed Highway Route options (Inner route, Middle route and Outer route) for Ipswich Northern Route scheme (**Figure 1** in **Appendix A**). Three Design Manual for Road and Bridges (DMRB) WebTag worksheets (one per route option) and a contribution to the Strategic Outline Business Case (SOBC) have been produced as part of the assessment. This document is intended to support the WebTags and SOBC. The assessment has been carried out in accordance with the DMRB guidance (DMRB 2007).

1.1.2. Statutory provision for the safeguarding of heritage assets has been made at a national and local level. For this reason, their presence or potential presence can constitute a constraint and may affect the initial selection of development options and in the subsequent design, planning and programming.

1.1.3. The report provides a top-level mapping of the likely designated heritage constraints specific to the three proposed route options with the aim of flagging potential issues and opportunities, so that they may be anticipated and planned for. Known non-designated heritage assets have not been included.

1.1.4. This document does not constitute a Historic Environment Desk Based Assessment (HEDBA), often required by the Local Planning Authority (LPA) to accompany a planning application. It is a high-level review of statutorily designated (protected) heritage assets within the site and its vicinity (i.e. the most sensitive assets). As a high-level appraisal of key heritage constraints, it does not consider non-designated heritage assets, including known or possible archaeological remains. It should be noted that some non-designated assets may be of equivalent heritage significance to designated heritage assets.

1.2. AIMS AND OBJECTIVES

1.2.1. Archaeology and built heritage has been a material consideration in the planning process since the publication of the now-superseded Planning Policy Guidance Note 16 (PPG16) in 1990 and its value is recognised in national and local planning policy. The aim of this report is to provide high-level DMRB Webtag worksheets for each of the three route options, identifying the key heritage constraints, in the form of designated heritage assets, along with supporting heritage constraints mapping and gazetteer.

2. METHODOLOGY AND SOURCES

2.1. DESK-BASED HERITAGE CONSTRAINTS MAPPING

2.1.1. The assessment has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) (MHCLG 2018a, MHCLG 2018b) and to standards specified by the and Historic England (HE 2016, 2017) and the Design Manual for Road and Bridges (DMRB 2007).

2.1.2. The table below provides a summary of the key data sources used for the constraints appraisal. This is from key sources and information immediately available within a 500m 'study area' buffer around each option.

2.1.3. A more comprehensive review of non-designated heritage assets recorded on the Suffolk Historic Environment Record (HER), the main repository of archaeological information, has not been undertaken. Historic maps, documentary sources, geotechnical data, architectural and engineering drawings, archaeological reports and aerial photographs normally carried out for a Historic Environment Desk-Based Assessment (HEDBA) has not been undertaken. No site visit has been undertaken. Detailed consideration of potential impacts will form part of the scope for a HEDBA, once the chosen option has been identified.

Table 1: Summary of data sources

Source	Data	Comment
Historic England	National Heritage List (NHL) with information on statutorily designated heritage assets	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development, in terms of both physical impacts (demolition/alteration) and setting.
Local Planning Authority	Conservation Area extents	Conservation Areas can provide a significance constraint to development, in terms of both physical impacts (demolition/alteration) and setting.

2.1.4. The report figures in Appendix C show the location of statutorily designated heritage assets within the study area, as identified by the sources above. These have been allocated a reference number for Scheduled Monuments (**SM1**, **SM2**, etc.). Registered Park or Gardens (**RPG1**, **RPG2**, etc.) Conservation Areas (**CA1**, **CA2**, etc.) or listed buildings (**LB1**, **LB2** etc.) which is listed in the gazetteer in Appendix A.

2.1.5. Note that LPA locally listed buildings have not been identified as this information is not readily available. Locally listed buildings are a material consideration, but are not afforded the same level of protection as a statutorily listed building.

2.2. SIGNIFICANCE

2.2.1. 'Significance' lies in the value of a heritage asset to this and future generations because of its heritage interest, which may be historic, archaeological, architectural or artistic. The significance of heritage assets, described in Tables 1 to 4 in Appendix A, is derived from DMRB Volume 11, Section 3 Part 2: HA 208/07 Cultural Heritage.

Appendix A

GAZETTEER OF DESIGNATED HERITAGE ASSETS

The table below represents a gazetteer of designated heritage assets within the study area. Each entry has a Scheduled Monument (SM) number, a Registered Park or Garden (RPG) number, a Conservation Area (CA) number or a listed building (LB) number. The gazetteer should be read in conjunction with the designated heritage asset constraints maps.

Note that LPA locally listed buildings are not included within the scope of this high level assessment.

Table A-1 - Gazetteer of Scheduled Monuments

The Scheduled Monuments are of High significance.

Scheduled Monument (SM) ref.	Description	NHL ref.
SM1	**Settlement site around St Botolph's Church** Late Iron Age settlement site. Large quadrilaterial, double ditched enclosure, covering 7 ha bisected by Drabs Lane and partially occupied by Burgh church.	1006035
SM2	**Bowl barrow in Portal Avenue** Bronze Age barrow which is visible as an earthen mound standing to a height of 2.6m and covering an area 30m in diameter.	1008729
SM3	**Bowl barrow 680m north of Dobbs Corner** Bronze Age barrow which is visible as an earthen mound standing to a height of 0.8m and covering a circular area approximately 20m in diameter.	1008526
SM4	**Bowl barrow 580m north of Dobbs Corner** Bronze Age barrow which is visible as an earthen mound standing to a height of approximately 1m and covering a circular area with a maximum diameter of 25m.	1008509

Table A-2 – Gazetteer of Registered Park and Gardens

The Grade I Registered Park and Garden is of High significance. The Grade II Registered Park and Garden is of Medium significance.

Registered Park and Garden (RPG) ref.	Description	Grade	NHL ref.
RPG1	**Shrubland Hall**	I	1000155

Registered Park and Garden (RPG) ref.	Description	Grade	NHL ref.
	17th century park estate to Shrubland Hall, extended in late-18th century by Humphry Repton and early-19th century by William Woods.		
RPG2	**Woodbridge Cemetery** Cemetery, laid out in 1856 and opened in 1864. Incorporated a site previously used as a burial ground in the Napoleonic War.	II	1001652

Table A-3 – Gazetteer of Conservation Areas

The Conservation Areas are of High significance.

Registered Park and Garden (RPG) ref.	Description
CA1	**Coddenham** The conservation area was designated to cover the agricultural settlement of Coddenham.
CA2	**Woodbridge** The conservation area was designated to cover the historic code and quays of Woodbridge. Woodbridge has evolved as a market town, as a port and a trading centre since the medieval period.

Table A-4 - Gazetteer of statutorily listed buildings

The Grade I and Grade II* listed buildings are of High significance. The Grade II listed buildings are of Medium significance.

Listed Building (LB) ref.	Description	Grade	NHL ref.
LB1	**Chimney Pot** Late-16th century house, timber-framed and plastered.	II	1352069
LB2	**Limekiln Cottage** Late-16th century house, timber-framed and plastered.	II	1181930

LB3	**Limekiln Farmhouse** Two cottages, built as one farmhouse in late-16th/early-17th century. Timber-framed and plastered.	II	1033238
LB4	**Walling of Former Stable 50 Metres West of Coddenham House** Shell of former stable, c. 1770. Built as domestic stabling for rectory, red brick.	II	1033229
LB5	**Coddenham House** House, built c. 1770 as a vicarage for Sir Nicholas Bacon. Red brick and slate roof.	II	1352039
LB6	**The Shrubberies** House, c. 1840, with 16th century core. Timber-frame core, 19th century part gothic in flint rubble and red brick dressings.	II	1352045
LB7	**Church of St Mary** Parish church, medieval with major phases of mid-14th and late-15th centuries.	I	1033267
LB8	**Nos 1 to 5 Church Cottages** Terrace of 5 houses, built in two stages and probably as one house: a 15th century hall house, with extension to the left of late-16th century. Timber-framed and plastered.	II	1033228
LB9	**Coddenham War Memorial** WW1 memorial, unveiled 1920 with WW2 additions. Granite, wheel-head cross on a pedestal.	II	1452648
LB10	**Fairholme** House, early-19th century with 18th century core. Timber-framed and plastered.	II	1033268
LB11	**Manor Farmhouse** Farmhouse, mid-17th century, timber-framed and plastered.	II	1352038
LB12	**Holbeck House** House, 15th century with later alterations. Timber-framed and pebble-dashed.	II	1033269
LB13	**The Homeland** House, early or mid-16th century. Timber-framed and plastered.	II	1352019
LB14	**The Red House** House, late-18th century. Red brick with white tuck pointing and plain tiled roof.	II	1033227

LB15	**The Old Dower House** House, early or mid-16th century. Part of the winter house built for the Woodhouse family of nearby Crowfield Hall. Timber-framed and pastered.	II	1284940
LB16	**Gryffon House** House, early or mid-16th century. Part of the winter house built for the Woodhouse family of Crowfield Hall. Timber-framed and plastered.	II	1033233
LB17	**Coddenham Coutry Club and Doctors Surgery** Clubhouse and doctor's surgery, built early or mid-16th century in two stages. Probably a service range to Gryffon House. Timber-framed and mainly plastered.	II	1352042
LB18	**The Old Lodge and The Post Office** House and post office with dwelling above and to the rear. Early/mid-16th century. Timber-framed.	II*	1181646
LB19	**The Cottage** Two cottages, built early or mid-16th century. Timber-framed with plaster and pebble-dash.	II	1033234
LB20	**The Dukes Head Inn** Public house, c. 1600, timber-framed and pebble-dashed.	II	1181673
LB21	**Willow Farmhouse** Former farmhouse, late-16th century with alterations of mid-17th century. Timber-framed and plastered.	II	1033266
LB22	**Hemingstone Hall and Attached Garden Walls On The South West Side** Former manor house, early-17th century built perhaps 1625 for William Style. Red brick encasing timber-framing.	I	1182536
LB23	**Brick Kiln Farmhouse** Farmhouse, 15th century or early-16th century. Timber-framed and plastered.	II	1182712
LB24	**Leedes Farmhouse** Farmhouse, core of c.1500 with later extensions. Timber-framed and plastered.	II	1284484
LB25	**Barn 30 Metres South East of Leedes Farmhouse** Barn, late-17th century, timber-framed and weatherboarded.	II	1033042
LB26	**Bulls Farmhouse** Farmhouse, 15th century core with alterations from mid-16th century. Timber-framed and pebble-dashed.	II	1182609

LB27	**Old Hall Cottage** Cottage, early-16th century. Timber-framed and plastered.	II	1352153
LB28	**Old Hall Farmhouse** Farmhouse, early-17th century, timber-framed and plastered. House has many minor items of joinery and ironmongery which contribute to character.	II*	1182665
LB29	**Cartlodge, 50 Metres South of Old Hall Farmhouse** Cartlodge, 18th century. Timber-framed. Ends originally open but not clad with weatherboarding, thatched roof. Good example of draw-through cartlodge, possible rare survival of medieval form.	II	1033045
LB30	**5, Main Road** Cottage, mid-18th century. Timber-framed and plastered with thatched roof.	II	1182688
LB31	**Barham Close** House, mid-18th century. Timber framed with thatched roof. Possible conversion of open-hall house.	II	1033287
LB32	**Coppings Farmhouse** House, 18th century. Timber-framed and faced in brick with slate roof.	II	1240223
LB33	**Nelson Farmhouse** Farmhouse, 17th century. Timber-framed and roughcast.	II	1030522
LB34	**Swilland Manor** House, c. 1600. Timber-framed and plastered.	II	1284239
LB35	**Church of St Mary** Medieval church, alterations of early-16th century.	II*	1030511
LB36	**Swilland Hall** Large house, 16th century timber-framed and plastered.	II	1183081
LB37	**Barn and Stable, 50 Metres North West Of Red Court** Barn, late-16th century including stable with hayloft above. Timber-framed and weatherboarded. Original wattle-and-daub infill panels survive in part. Barn combined with stabling in a single range is an unusual survival for Suffolk from this period.	II	1030512
LB38	**Moat Farmhouse** Farmhouse, probably 16th century. Timber-framed and plastered.	II	1030513
LB39	**Charity Farmhouse**	II	1377394

	Farmhouse, formerly small manor house. Early-15th century. Timber-framed and brick with colourwashed render.		
LB40	**Stanaway Farmhouse** Farmhouse, 17th century timber-framed with colourwashed render.	II	1377204
LB41	**Potash Farmhouse** Farmhouse, 16th century with 17th century additions. Timber-framed with colourwashed render and a plain tiled roof.	II	1030315
LB42	**Peartree Farmhouse** House, formerly farmhouse. Late-16th century, timber-framed with plain tiled roof.	II	1377396
LB43	**Uplandside** House, formerly farmhouse. Early-16th century restored with additions and alterations in 1930s. Timber-framed with colouwashed infill and thatched roof.	II	1198369
LB44	**Manor Cottage** House, late-16th/early-17th century. Timber-framed with colourwashed render and a thatched roof.	II	1030314
LB45	**Manor House** House, 16th century. Timber-framed with colourwashed render and brick, originally thatched.	II	1377399
LB46	**Mount Pleasant Farmhouse** House, formerly farmhouse. 16th or 17th century. Timber-framed with colourwashed render and brick.	II	1030310
LB47	**Redhouse Farmhouse** Farmhouse, now house. 17th century, timber-framed with colourwashed render and pantile roof.	II	1284067
LB48	**Looms Cottage** House, 17th century. Timber-framed with colourwashed render and a thatched roof. Former house of artist Anna Zinkeisen.	II	1030749
LB49	**Brickwall Farmhouse** House, formerly farmhouse. Late-16th century. Timber-framed with colourwashed render on brick plinth.	II	1197970
LB50	**The Round House** Lodge, early-19th century. Flint rubble with white brick dressings and thatched roof.	II	1284066

LB51	**Frogmore Cottages** Pair of cottages, 17th century. Timber-framed, colourwashed and rendered with a thatched roof.	II	1197996
LB52	**Lowood** House, early-19th century. Painted red brick with slate roof.	II	1377206
LB53	**White House Farmhouse** Farmhouse, c.1840, extended 1860. Gault brick at front, red brick at rear. Slate roof.	II	1030702
LB54	**Oaktree Farmhouse** House, formerly farmhouse. 16th and 17th century. Timber-framed with colourwashed brick.	II	1030728
LB55	**Cartshed Circa 50 Yards to South Of Oaktree Farmhouse** Cartshed, 18th century. Timber-framed with a colourwashed infill and pantile roof.	II	1198285
LB56	**Gull Farmhouse** Farmhouse, 17th century. Timber-framed with rendered brick infill.	II	1030731
LB57	**Turk's Head Public House** Public house, originally farmhouse. 17th century with 19th century brick encasement.	II	1283877
LB58	**Stable, Aligned North/South, 40 Metres North West of Broomvale Farmhouse** Stable, with hayloft above, 18th century. Timber-framed and weatherboarded.	II	1263026
LB59	**Barn, Aligned East/West, 30 Metres North West of Broomvale Farmhouse** Barn, 18th century. Timber-framed and weatherboarded.	II	1251394
LB60	**Barn 40 Metres North of Broomvale Farmhouse** Barn, late 18th century. Timber-framed and weatherboarded on red brick plinth.	II	1250942
LB61	**Broomvale Farmhouse** Farmhouse, 16th century core with later alterations. Timber-framed and painted brick.	II	1262786
LB62	**The Rooks** House, early-17th century. Timber-framed and plastered with thatched roof.	II	1250928
LB63	**Limekiln**	II	1251231

	House, formerly farmhouse. Early or mid-15th century. A H-plan open hall house. Timber-framed and encased in mid-19th century red brick.		
LB64	**The Beeches** House, c. 1840, gault brick with slate roof.	II	1263021
LB65	**Limekiln Approximately 80 Metres South East of Limekiln House** Limekiln, late-18th century/early-19th century. 1724 datestone (reset).	II	1262695
LB66	**Mockbeggars Hall** Hall, 1621. Elizabethan with Jacobean features. Red brick.	II*	1263022
LB67	**Claydon Hall** House, formerly manor house. Mid-14th century core with major later alterations. Timber-framed and plastered, partly encased in brick. Stands within incomplete homestead moat of 14th century, possibly former castle site.	II	1251154
LB68	**Church of St Mary** Church, medieval with mid-19th century restoration.	II*	1352028
LB69	**High House Farmhouse** House, formerly farmhouse. Late-16th century, timber-framed and plastered.	II	1262917
LB70	**Akenham Hall** House, formerly manor house. Late-18th century. Timber-framed and pebble-dashed.	II	1352029
LB71	**Witnesham Hall** Former manor house, now two dwellings. Mid-16th century with alterations c.1614. Timber-framed and encased in brick c.1842.	II*	1030518
LB72	**Walling, Gatepiers and Gates Attached to North Corner of Witnesham Hall** Walling, gatepiers and pair of gates of Witnesham Hall. 18th century, remodelled c. 1842. Red brick with terracotta copings.	II	1284174
LB73	**Stabling and Coach Houses 40 Metres North of Witnesham Hall** Central coach-house with stable and tack room of Witnesham Hall. 18th century core, remodelled 1842 in gothic style. Red brick.	II	1030519
LB74	**Church of St Mary**	I	1183185

	Medieval church, 19th century alterations.		
LB75	**Manor Farmhouse** Farmhouse, c.1600 with core of 15th century. Timber-framed and plastered.	II*	1377303
LB76	**Wood House** House, early or mid-17th century. Timber-framed and plastered.	II	1183180
LB77	**Hill Farmhouse** Farmhouse, c.1500. Partly demolished and rebuilt after fire in 19th century. Timber-framed and plastered.	II	1030523
LB78	**Stable Block at Grundisburgh Hall** Former stable block at Grundisburgh Hall, now house and estate office. 17th century, red brick.	II	1377203
LB79	**Grundisburgh Hall** House, early-17th century. Timber-framed with rendered and colourwashed infill.	II	1030723
LB80	**Park Farmhouse** Farmhouse, 15th or 16th century. Timber-framed with colourwashed render and 19th century red brick encasement.	II	1030721
LB81	**Old Rectory Cottages** Former rectory, now two cottages. Late-15th century with later additions and alterations. Timber-framed with colourwashed render and brick encasement.	II	1377179
LB82	**Hasketon Grange** Farmhouse, 17th century with 19th century additions and alterations. Timber-framed with brick encasement and colourwashed render.	II	1377207
LB83	**Barn Circa 20 Yards South East of Hasketon Grange** Barn, 18th century. Red brick with pantiled roof.	II	1283903
LB84	**Bealings House** House, late-18th century. Red brick with plain tile roof.	II	1284017
LB85	**Garden Ornament Circa 100 Yards East South East of Bealings House** Garden ornament, 19th century. Knapped flint and flint rubble with ashlar dressings. Pyramid with niches on two sides, central niche contains Indian deity, probably Kali.	II	1030754
LB86	**Birdshill**	II	1198058

	House, probably 14th century with later additions. Timber-framed with colourwashed render.		
LB87	**76, Grundisburgh Road** House, probably early-18th century. Timber-framed and plastered.	II	1198645
LB88	**Formerly The Sick House** House, late-18th century. Red brick.	II	1031072
LB89	**Drybridge Lodge** Lodge, 18th century, painted brick.	II	1283771
LB90	**22-26, Drybridge Hill** House, early-19th century, red brick with slate roof.	II	1031071
LB91	**10, Drybridge Hill** House, early-19th century, red brick.	II	1377055
LB92	**Barn at Seckford Hall And Spur Wall** Barn and spur wall. 16th or 17th century, red brick with tiled roof.	II	1377181
LB93	**Seckford Hall** Former manor house, now hotel. C.1553 for Thomas Seckford with later additions and alterations. E-shaped plan in red brick with tiled roof.	II*	1030755
LB94	**Seckford Hall Lodge** Former lodge or Gazebo to Seckford Hall. Mid-16th century, red brick with tiled roof.	II	1377127
LB95	**1, Top Street** House, late-18th century. Red brick with pantiled roof.	II	1198682
LB96	**Venns Farmhouse** Farmhouse, 17th century. Timber-framed and plastered.	II	1030520
LB97	**Walnut Tree Cottage** House, late-17th century. Timber-framed and rough-cast.	II	1183210
LB98	**Westerfield Hall** Hall, 17th century, red brick with purple headers. Datestone, 1683.	II*	1264761
LB99	**Barn and Outbuildings to South East of Westerfield Hall** Barn and outbuildings, c. 1656. Red brick with pantiled roof.	II	1236092
LB100	**Swan's Nest**	II	1236127

	House, 17th century, timber-framed and plastered. Refronted in the late-18th century in colourwashed brick.		
LB101	**The Slade** House, mid or late-18th century. Red brick.	II	1030517
LB102	**Allens House** House, mid-16th century, timber-framed and plastered.	II	1183141
LB103	**Laceys Farmhouse** Farmhouse, early-16th century with later alterations. Timber-framed and plastered with thatched roof.	II	1377301
LB104	**Garden Stone, 10 Metres North of Villa Farmhouse** Garage and garden store, building early-16th century as open-hall house. Timber-framed, weatherboarded with some red brick.	II	1284231
LB105	**Hill Farmhouse** Farmhouse, mid-16th century with later alterations. Timber-framed and pebble-dashed.	II	1030510
LB106	**Barn about 60 Metres East North East of Hill Farm House** Barn, late-17th or early-18th century. Timber-framed and weatherboarded.	II	1030483

Appendix B

REFERENCES

PUBLISHED AND DOCUMENTARY SOURCES

DMRB (2007) *Volume 11, Section 3 Part 2: HA 208/07 Cultural Heritage*.

Historic England, 2016 *The setting of heritage assets. Historic Environment Good Practice Advice in Planning Note 3*.

Historic England, 2017 *Conservation principles, policies and guidance. Consultation Draft*. Swindon

MHCLG 2018a [Ministry of Housing, Communities and Local Government], July 2018 *National Planning Policy Framework*

MHCLG 2018b [Ministry of Housing, Communities and Local Government], July 2018 *Conserving and Enhancing the Historic Environment: Planning Practice Guide*

OTHER SOURCES

Historic England designation data

Mid Suffolk District Council – conservation areas

Suffolk Coastal District Council – conservation areas

Appendix C

FIGURES

Date Modified:

Drawn By:

File:

KEY

Study areas

Outer Route

Middle Route

Inner Route

0 0.3 0.6 1.2 1.8 2.4

Kilometres

wsp

TITLE:

Route options and study areas

FIGURE No:

FIGURE 1

Date Modified:

Drawn By:

File:

KEY

- Scheduled Monument
- Grade II* listed building
- Grade II listed building
- Inner route study area

LB63 LB64 LB65 LB62 LB67 LB69 LB70 LB96 LB97

LB61 LB58 LB59 LB60 LB68 LB66

LB99 LB98 LB100 LB101

LB102 LB103

LB104 LB105 LB106

SM2 SM3 SM4

0 0.225 0.45 0.9 1.35 1.8 Kilometres

wsp

TITLE:

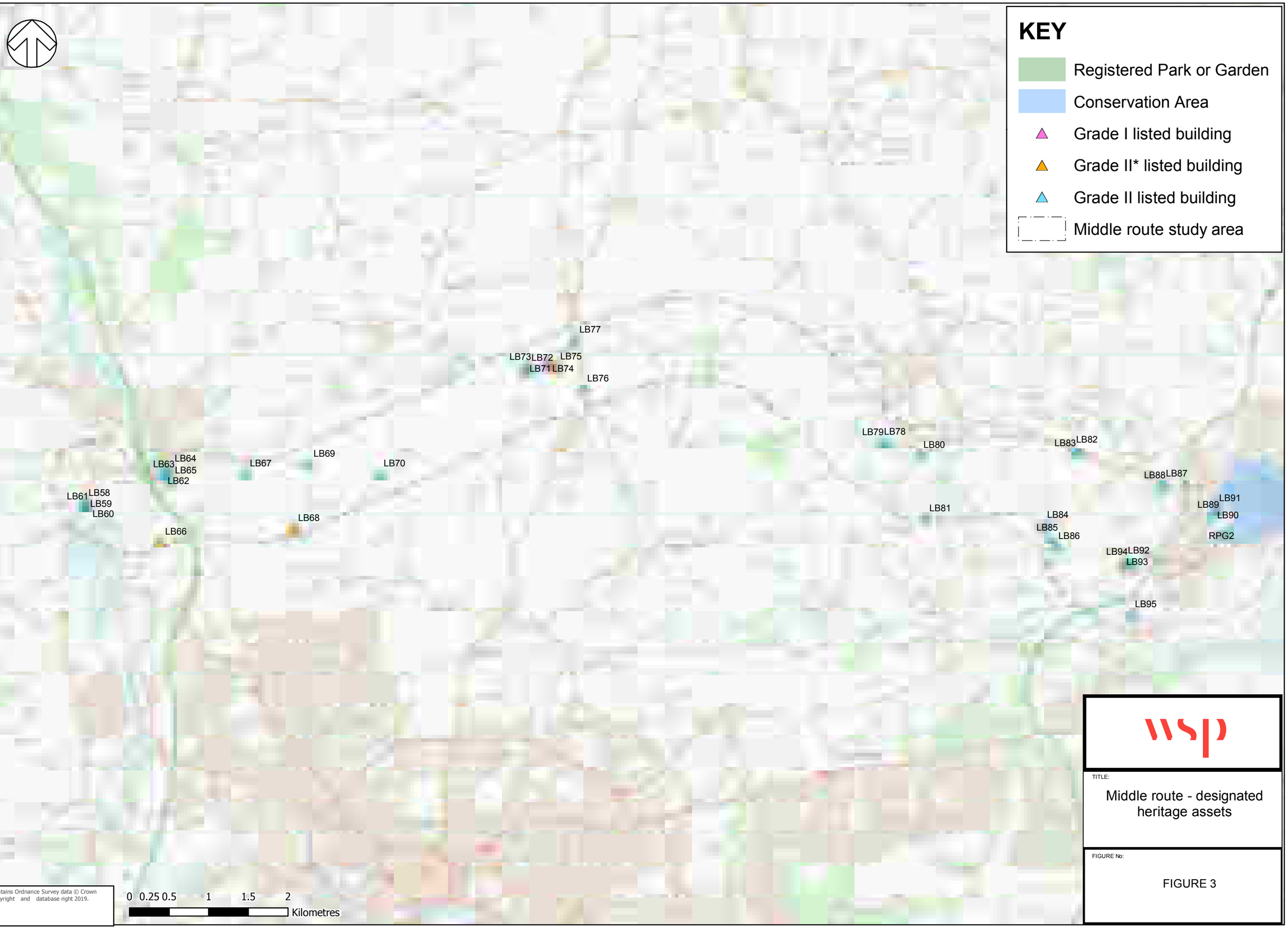
Inner route - designated heritage assets

FIGURE No:

FIGURE 2

Date Modified:

Drawn By:



wsp

TITLE:

Middle route - designated heritage assets

FIGURE No:

FIGURE 3

File:

Date Modified:

Drawn By:

KEY

- Scheduled Monument
- Registered Park or Garden
- Conservation Area
- Grade I listed building
- Grade II* listed building
- Grade II listed building
- Outer Route study area

LB1
LB3
LB2
LB4
LB5
LB8
LB9
CA1
LB6
LB7
LB21
LB22
LB23
LB24
LN28
LB27
LB29
LB26
LB25
LB30
LB31
RPG1
LB32
LB33
LB34
LB38
LB39
LB40
LB41
LB43
LB45
LB44
LB42
LB35
LB36
LB37
LB46
LB47
LB48
SM1
SM1
LB49
LB50
LB51
LB53
LB52
LB55
LB54
LB56
LB57

0 0.375 0.75 1.5 2.25 3 Kilometres

File:

wsp

TITLE:

Outer route - designated heritage assets

FIGURE No:

FIGURE 4

Appendix F

ENVIRONMENTAL AND PLANNING POLICY REVIEW

PART A: SCHEDULE OF RELEVANT POLICIES REVIEWED

Policy	
National	**Summary**
The Strategic Road Network and the Delivery of Sustainable Development 2013	The Circular 02/2013 by Department for Transport. It requires new Projects to gain approval from Highways England if there is a potential impact on the Strategic Road Network (SRN).
National Planning Policy Framework (NPPF)	Produced by Ministry of Housing, Communities and Local Government (MHCLG) in updated in 2019. The revised NPPF sets out the Government's planning policies for England and how these should be applied.
National Policy Statement for National Networks (NPSNN)	Produced by Department for Transport in 2014. It sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks. It is the policy against which decisions on major road and rail projects are made.
The Highways Act 1980	The Highways Act 1980 is an Act of the Parliament of the United Kingdom which deals with the management and operation of the road network in England and Wales.
The Localism Act 2011	The Localism Act 2011 is an Act of Parliament which sets out a series of measures which aim to devolve power from central government to local communities. This includes the rights and powers for communities and individuals.
International Policy – United Nations Framework Convention on Climate Change (UNFCCC)	The UNFCCC is an international environmental treaty adopted on 9 May 1992. The UNFCCC objective is to *"stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."* The UNFCCC drives international action on climate change. The UK has pledged to reduce GHG emissions under the Paris Agreement, as a part of a joint pledge by members of the European Union (EU). This provides an overarching commitment by the UK.
The Control of Pollution Act 1974	The Control and Pollution Act 1974 was introduced by the Government. It aims to deal with a variety of environmental issues, including waste on land, water pollution, noise pollution and the prevention of atmospheric pollution.
Noise Policy Statement for England (NPSE)	NPSE was produced by the Department for Environment, Food & Rural Affairs in March 2010. It sets out the long-term vision for government policy on noise and aims to avoid / mitigate significant adverse impacts on health and quality of life and contribute to improvement.
The Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland	The AQS was produced by the Department for Environment, Food & Rural Affairs and published in March 2011. The Strategy sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. For road traffic emissions, which are a focus of this assessment, the main pollutant of concern is NO2.
'A Green Future: Our 25 Year Plan to Improve the Environment'	This Plan was produced by the Department for Environment, Food & Rural Affairs and first published in March 2011. It has been updated on February 1st, 2018. It sets out government action to help the natural world regain and retain good health.

Clean Growth Strategy	The Clean Growth Strategy was published by the Department for Business, Energy & Industrial Strategy in October 2017 and last updated on 16 April 2018. It sets out the policies and proposals that aim to accelerate the pace of "clean growth".
Road to Zero Strategy	The Strategy was published in July 2018 by the Department for Transport, Office for Low Emission Vehicles. It sets out the Government's strategy for reducing emissions of the road transport sector.
Climate Change Act 2008	It is an Act of Parliament of the United Kingdom. The Act established the world's first long term legally binding framework to tackle the dangers of climate change. It created a new approach to managing and responding to climate change in the UK.
Environment Act 1995	There is a responsibility under Section 62 of the Environment Act 1995 to have regard for the purposes of the National Parks, which includes 'to conserve and enhance the natural beauty, wildlife and cultural heritage of the National Parks' (for Landscape, Cultural Heritage & Biodiversity).
The Environmental Protection Act 1990	The Environmental Protection Act 1990 is an Act of the Parliament of the United Kingdom that as of 2008 defines, within England and Wales and Scotland, the fundamental structure and authority for waste management and control of emissions into the environment.
The Air Quality Standards Regulations 2010 (as amended)	The Air Quality Standards Regulations 2010 (SI 2010, No.1001) (as amended) transpose the Ambient Air Quality Directive (2008/50/EC) into law in England. The SoS is responsible for ensuring limit value compliance. The UK is divided into 43 zones for reporting compliance and Suffolk is included in the Eastern zone which is compliant.
The Infrastructure Planning (Decision) Regulations 2010	Made by the Secretary of State. The Planning Act 2008 establishes the Infrastructure Planning Commission and provides for the making of orders granting development consent for certain types of nationally significant infrastructure projects. The Regulations set out matters to which the Secretary of State, the Commission's Council or a Panel of Commissioners (as the case may be) must have regard when deciding applications for development consent relating to: listed buildings, conservation areas and ancient monuments (regulation 3); deemed licences under Part 2 of the Food and Environment Protection Act 1985 (regulation 4); deemed consents under section 34 of the Coast Protection Act 1949 (regulation 5); and hazardous substances (regulation 6).
The Countryside and Rights of Way Act 2000	The Countryside and Rights of Way Act 2000 amongst other ecological matters provides for public access on foot to certain types of land and amends the law relating to ProW.
The Public Rights of Way (Combined Orders) (England) Regulations 2008 (as amended)	These Regulations were published in 2008 and were amended in 2010. Regulations aim to provide access to all ProW where some rights are also open to horse riders, cyclists and motorists.
The Water Environment **(Water Framework Directive) (England and Wales) Regulations 2017 (2000/60/EC)**	These Regulations make provision for the purpose of implementing in river basin districts within England and Wales Community legislation in the field of water-related environment and more generally water management-related issues. Among other things, require the identification of river basin districts, and a number of

	other assessments to be carried out by the Environment Agency to characterise and classify the status of water bodies in those.
The Environmental Damage (Prevention and Remediation) Regulations 2015	These Regulations impose obligations on operators of economic activities requiring them to prevent, limit or remediate environmental damage caused by their operations.
The Environmental Permitting (England and Wales) Regulations 2017 (as amended)	These Regulations provide a consolidated system of environmental permitting in England and Wales.
The Construction (Design & Management) Regulations 2015	These Regulations are the main set of regulations for managing the health, safety and welfare of construction projects.
The Ancient Monuments and Archaeological Areas Act 1979	The Ancient Monuments and Archaeological Areas Act 1979 aims to protect the archaeological heritage of England.
The Planning (Listed Buildings and Conservation Areas) Act 1990	This Act relates to special controls in respect of buildings and areas of special architectural or historic interest. It also introduces Building Preservation Notices and authorisation procedures for works to be carried out on listed buildings.
The Wildlife and Countryside Act 1981 (as amended)	The Wildlife and Countryside Act 1981 is an Act of Parliament in the United Kingdom implemented to comply with European Council Directive 2009/147/EC on the conservation of wild birds. It gives protection to native species, controls the release of non-native species, enhances the protection of Sites of Special Scientific Interest and builds upon the rights of way rules in the National Parks and Access to the Countryside Act 1949.
The Natural Environment and Rural Communities (NERC) Act 2006 (as amended)	The Natural Environment and Rural Communities Act 2006 (NERC) was the Act of Parliament that established Natural England by merging English Nature, the Rural Development Agency and the Countryside Agency. The Act makes provision in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species.
The Conservation of Habitats and Species Regulations (Habitats Regulations) 2017 (as amended)	The Regulations came into force on 30 November 2017 and extend to England and Wales (including the adjacent territorial sea). The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.
The Clean Neighbourhoods and Environment Act 2005	The Act states that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner. In accordance with this, employees must undertake waste disposal activities as outlined in national law.
The Waste Minimisation Act 1998	The Act enables local planning authorities to take the appropriate steps to reduce and minimise the generation of household, commercial or industrial waste within their area.

The Controlled Waste (England and Wales) Regulations 2012 (as amended)	These Regulations provide a definition of controlled waste and classifies waste as household, industrial or commercial waste. It allows Local Authorities to implement charges for the collection of waste from non-domestic properties.
The Waste (England and Wales) Regulations 2011 (as amended)	These Regulations are legislative requirements of the EU Directive transposed into UK law via this regulation. It stipulates the requirement for industry and businesses to implement the Waste Hierarchy.
The Hazardous Waste (England and Wales) Regulations 2005 (as amended)	These Regulations introduce measures to control storage, transport and disposal of hazardous waste. It provides a means to ensure that hazardous waste and any associated risks are appropriately managed.
Waste Management Plan for England	This Plan was published in 2013 and provides a detailed analysis of the present state of waste management at the national level and assesses how the objectives of the Revised Waste Framework Directive will be effectively supported. The Waste Management Plan for England also outlines the waste hierarchy, which gives top priority to waste prevention, followed by preparing for reuse, the recycling, other types of recovery and finally disposal (e.g. landfill).
National Planning Policy for Waste	This Policy was published by Department for Communities and Local Government in 2014. It outlines the ambition to promote a sustainable approach to resource use and management. It sets out waste planning policies and should be read alongside: the NPPF; the National Waste Management Plan for England and any relevant successor policies, guidance or documents.
The European Union (EU) Ambient Air Quality Directive (2008/50/EC)	The European Union (EU) Ambient Air Quality Directive (2008/50/EC) sets legally binding limit values for concentrations in outdoor air of key air pollutants that impact public health including nitrogen dioxide (NO2) and small particles known as PM10 and PM2.5. The regulations also set a critical level for annual mean nitrogen oxides (Nox) for the protection of vegetation.
The Groundwater Directive 2006/118/EC 19	Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.
The Water Framework Directive (2000/60/EC)	The overall objective of the Water Framework Directive (WFD) is to bring about the effective co-ordination of water environment policy and regulation across Europe.
The Flood and Water Management Act 2010	The Flood and Water Management Act 2010 created the role of the Lead Local Flood Authority (LLFA) (in this case Suffolk County Council) to take responsibility for leading the co-ordination of local flood risk management in their areas. In accordance with this Act, the EA is responsible for the management of risks associated with main rivers, the sea and reservoirs.

[19] HMSO (2006) Groundwater Directive 2006/118/EC

Regional	
The Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies	The SCDLP was prepared and published by Suffolk County Council in 2013. The Plan aims to improve transport, environmental and community infrastructure to support growth in the region.
Air Quality Management Areas (AQMAs)	AQMAs were established in December 2017. Each local authority in the UK has been carrying out a review and assessment of air quality in their area.
Suffolk Minerals & Waste Local Plan	The Suffolk Minerals & Waste Local Plan was submitted by Suffolk County Council (regional plan) to the Planning Inspectorate on 21 December 2018 for Examination in Public and is currently being updated. The aim of the plan is to detail policies for minerals and waste in the Suffolk region.
Suffolk Local Transport Plan 2011 – 2031	The Suffolk Local Transport Plan (SLTP) 2011 – 2031 was published in 2011. It outlines Suffolk Council's objectives for transport in the County.
Norfolk and Suffolk Economic Strategy	The Norfolk and Suffolk Economic Strategy (N&SES) published in 2017 sets out Norfolk and Suffolk's long term economic strategy for 20 years and focuses primarily on supporting the local economy and support future sustainable economic growth.
Suffolk Biodiversity Action Plan	This plan was published in May 2012 and it covers forward plans including local planning documents, Shoreline Management Plans and Local Authority coastal defence planning and Areas of Outstanding Natural Beauty (AONB) management plans.
Suffolk Community Strategy 2008 -2028	The Suffolk Community Strategy (SCS) 2008-2028 published in 2008 highlights the creation of 'The Greenest County' which is the priority for the SCS. The three key themes of this SCS 2008-2028 are: climate mitigation, climate adaptation and protecting and enhancing the natural environment.
Suffolk Climate Action Plan 3	In March 2017 Suffolk Climate Change Partnership published Suffolk Climate Action Plan 3 fostering business and community resilience, reducing carbon emissions and increasing local economic growth, our third such plan. This document replaces the second Plan, which was published in July 2012.
Anglian River Basin Flood Risk Management Plan 2015-2021 (2016)	This Plan was set and published by the Environment Agency in March 2016.
East Suffolk Catchment Flood Management Plan (2009)	This Plan was set and published by the Environment Agency in December 2009.
Suffolk Flood Risk Management Strategy (2016)	The Strategy was set by Suffolk County Council in March 2016.
Mid Suffolk's Core Strategy (2008)	Mid Suffolk's Core Strategy was adopted in September 2008. As the key Development Plan Document it sets out the vision, objectives, spatial strategy and core policies that will guide development across the district until 2025, and beyond. A Core Strategy Focussed Review was undertaken and adopted by the Council on 20th December 2012
Mid Suffolk Local Plan (1998)	The First Alteration to the Mid Suffolk Local Plan affordable housing policies was adopted by the District Council on 13 July 2006. Policies superseded: H4 and H5 of the Local Plan.

	The 1998 Local Plan has mostly been superseded by policies from the Core Strategy and Focussed Review and the Stowmarket Area Action Plan. View a list of the saved policies. The 1998 Local Plan document is being replaced by a new Joint Local Plan document for Babergh and Mid Suffolk districts.
Local Policy	
Ipswich Local Plan 2011-2031: **Core Strategy and Policies Development Plan Document Review**	The Ipswich Local Plan (Ipswich LP) 2011-2031. The plan was adopted in 2017. The adopted Core Strategy and Policies DPD Review is a strategic document setting out the vision, objectives and spatial planning strategy for the Borough of Ipswich up to 2031 and contains policies to facilitate sustainable development.
Ipswich Borough Council: **New Local Plan Review**	The Ipswich Borough Council is undertaking a review of the adopted Ipswich Local Plan (LP) 2017, to look ahead to 2036. The plan went through the first stage of consultation, next stage of consultation is planned for early 2019.
Babergh District Council: Local Plan (2006)	The Babergh Local Plan Alteration No.2 was adopted by the Council on 1 June 2006. It sets out the detailed policies and proposals for the control of development across the district.
Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)	The Babergh District Council Local Plan (BDC LP) 2011-2031 published in February 2014. It highlights the need for sustainable development. The Policy CS3 ('Strategy for Growth and Development') outlines the need for growth meaning that improvement to transport networks will be important.
Ipswich Borough Council: Low Emissions Strategy SPD (Draft) (2017)	The scope of this draft SPD published in 2017. The Strategy relates to mitigating emissions from transport related to new development, considering use and types of vehicles, the role of walking, cycling and public transport and the role of trees and vegetation in absorbing pollutants.
Babergh District Council: Rural Development and Core Strategy Policy CS11 SPD (2014)	This SPD was published in 2014. The SPD has been produced to provide guidance on the interpretation and application of Policy CS11 of the Babergh Core Strategy (adopted on 25th February 2014).
Creating Growth, Cutting Carbon, Making Sustainable Local Transport Happen (2011)	This document was prepared by the Department for Transport and published in January 2011. It outlines the vision for a transport system that is an engine for economic growth while is also greener, safer and improves quality of life in communities. This document is part of the overall strategy to tackle carbon emissions from transport.
Ipswich Borough Council: **Public Open Space SPD (2017)**	This SPD was published in 2017 and covers ten different types or typologies of public open space. It provides detailed guidance on: the protection of existing open spaces and outdoor sport and recreation facilities from inappropriate development; the requirements for new open spaces and outdoor sport and recreation facilities provision associated with new development and advice on maintenance; and the enhancement of the Borough's tree canopy cover.

Ipswich Borough Council: Local List (Buildings of Townscape Interest) (2013)	This SPD was adopted in 2013. Following a review, revisions to the Local List were adopted on 27th July 2016.
Ipswich Borough Council: Rural Development and Core Strategy Policy CS11 (2014)	This SPD through Policy CS15 ('Implementing Sustainable Development in Babergh') highlights that new proposals must respect the landscape, landscape features, streetscape/townscape, historic assets, important spaces and historic views.
Ipswich Borough Council: Space and Design Guidelines (2015)	The SPD adopted in November 2015 highlights that new development must be sustainable, environmentally friendly, enhance conditions for biodiversity, and be resilient to the effects of climate change.
Ipswich Borough Council: Reptile SPD (Draft)	Under preparation by Ipswich Borough Council is preparing a Reptile SPD. The SPD will provide additional guidance to policies contained in the Ipswich Local Plan (currently the Core Strategy and Policies development plan document 2011 and remaining saved policies of the Ipswich Local Plan 1997).
Ipswich Borough Council: Ipswich Urban Character SPD (2015)	The Urban Character SPD provides design guidance to support the implementation of adopted Core Strategy policies CS2, The Location and Nature of Development, and DM5, Urban Design Quality. These policies aim to protect and enhance the special character and distinctiveness of Ipswich. The SPD does not cover conservation areas.
Other Relevant Policy /Guidance/ Notes	
Planning Practice Guidance: Noise (2014)	Planning Practice Guidance: Noise was published in 2014 and contains advice on noise exposure hierarchy and advice on how LOAEL and SOAEL should be interpreted (see table 10-2 below).
General Principles of Environmental Assessment, Design Manual for Road and Bridges (DMRB)	The DMRB Volume 11, Section 3, Part 7, HD 213/11 Revision 1 was published in 2008. It sets out a methodology for assessing road traffic noise in terms of perceived nuisance.
British Standards 5228-1: 2009+A:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise	This Code was published in December 2008. It provides guidance on the measurement and prediction of construction noise and recommends basic methods of noise control where there is a need to protect persons working or living near, and those working on, construction and open sites.
British Standards 5228-2: 2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration	As for the above, this was published in December 2008. It provides basic recommendations for vibration control where work on construction and open sites generates significant levels of vibration.
British Standards 6472-1: 2008 Guide to Evaluation of Human Exposure to Vibration in Buildings. Part 1: Vibration Sources Other Than Blasting	Published in June 2008. It provides guidance on the methods to assess the effects of environmental vibration on people in residential and other environments.
Calculation of Road Traffic Noise	The former Department of Transport/Welsh Office technical memorandum CRTN published in 1988. It sets out a standardised method for the calculation of noise from road traffic.

Highways England Peoples and Community Clarification Note	This note was published in 2012 and it recommends combining the Interim Advice Note (IAN) assessments of 'Community and Private Assets' and 'Effects on all Travellers' into a single topic entitled 'People and Communities'. This Clarification Note will be adhered to within this assessment and has therefore been considered within this Chapter of the PEIR.
Design Manual for Roads and Bridges Guidance (Volume 11, Section 3)	The DMRB was introduced in 1992 in England and Wales, and later in Scotland and Northern Ireland. It includes all current standards, advice notes and other documents relating to the design, assessment and operation of trunk roads, including motorways. The scope adopted for this assessment is also based on relevant part of existing DMRB guidance, specifically Part 6 (Land Use); Part 8 (Pedestrian, Equestrians, Cyclists and Community Effects), and Part 9 (Vehicle Travellers).
Highways England Interim Advice Note (IAN) 195/16 Cycle Traffic and the Strategic Road Network	This guidance has been used to inform this assessment.
The UK Post 2010 Biodiversity Framework 2011-2020 (2012)	The UK Post 2010 Biodiversity Framework 2011-2020 was produced by Joint Nature Conservation Committee and DEFRA, on behalf of the Four Countries' Biodiversity Group (4CBG), through which the environment departments of all four governments in the UK work together.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services	This strategy was published in 2011 and provides a comprehensive picture of how we are implementing our international and EU commitments.
Interim Advice Note (IAN) 153/11 Guidance on the Environmental Assessment of Material Resources	The IAN was published in 2011 and provides guidance for the assessment of impacts and effects associated with the use of materials in new construction, improvement and maintenance projects. Outlines the consideration of material resource use and waste as part of an Environmental Impact Assessment process.
Ipswich Borough Council: Development and Flood Risk SPD (2017)	This SPD was adopted on 18th September 2013 by Ipswich Borough Council. This document was first updated in May 2014 and has subsequently been updated in January 2016 to reflect changes to national and local policy and guidance.
Sustainable drainage systems: non-statutory technical standards (2015)	The standards published by DEFRA in March 2015, set out the core technical standards for SUDS proposed within England. These standards should be used in accordance with the NPPF and PPG. The standards include guidance on controlling flood risk within a development boundary and elsewhere, peak flow and runoff volume control, and the structural integrity of SUDS.
Groundwater Protection Technical Guide (2017)	The EA is the statutory body responsible for the protection and management of groundwater resources in England. The groundwater protection guides published in March 2017 set out the framework for the EA regulation, and replace Groundwater Protection: Principles and Practice GP3. In summary, Section C sets out the EA's position statements and approach to managing and protecting groundwater in relation to infrastructure developments.

PART B: DETAILED REVIEW OF RELEVANT POLICIES AGAINST ENVIRONMENTAL TOPICS

NOISE AND VIBRATION

Legislation

The Control of Pollution Act 1974

The Control and Pollution Act 1974 was introduced by the Government. It aims to deal with a variety of environmental issues, including waste on land, water pollution, noise pollution and the prevention of atmospheric pollution.

National Policy

NPPF

The NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from or being adversely affected by unacceptable levels of noise pollution. It requires that planning policies and decisions should avoid noise from giving rise to significant adverse impacts, mitigate and reduce those impacts, identify and protect areas of tranquillity. It also states that it should be recognised that development will often create some noise and that developments should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.

NPSNN

NPSNN, Paragraph 5.189 states that where a development is subject to Environmental Impact Assessment (EIA) and significant noise impacts are likely to arise from the proposed development, the applicant should produce a noise assessment, which includes Noise and Vibration baseline, sensitive receptors, predictions of changing in baseline with the proposed development and mitigation measures. Paragraph 5.193 requires developments to be undertaken in accordance with the statutory requirements for noise. Paragraph 5.199 states that for most national network projects, the relevant Noise Insulation Regulations will apply.

NPSE

The NPSE sets out the long-term vision for government policy on noise and aims to avoid / mitigate significant adverse impacts on health and quality of life and contribute to improvement.

'A Green Future: Our 25 Year Plan to Improve the Environment'

Although the 25 Year Environment Plan does not have any goals or topics aimed directly at noise, the Plan states: *"over the next 25 years, we must significantly cut all forms of pollution and ease pressure on the environment. We must ensure that noise and light pollution are managed effectively"*.

Regional Policy

Suffolk Coastal District Local Plan

The SCDLP was prepared and published by Suffolk County Council in 2013. The Plan highlights the importance of addressing noise and vibration matters related to new developments. Strategic Policy SP1 ('Sustainable Development') specifically aims to promote the use of sustainable methods of construction.

Local Policy

Ipswich Local Plan 2011-2031

Development Management, Policy DM1 ('Sustainable Design and Construction') requires that where appropriate, mitigation measures shall be secured by condition to ensure that any pollution through air, noise, dust or vibration during the construction phase of development will not be detrimental to the amenity of neighbouring uses.

Ipswich Borough Council: New Local Plan Review

The Ipswich Borough Council is undertaking a review of the adopted Ipswich Local Plan (LP) 2017, to look ahead to 2036. The plan went through the first stage of consultation, next stage of consultation is planned for early 2019. Development Management, Policy DM26 ('Protection of Amenity') provides specific guidance on neighbouring amenity and highlights that development which could itself be significantly adversely affected by the conduct of established or potentially noisy or polluting uses nearby will not be permitted. It states that exceptions will only be made where satisfactory mitigation measures can be secured by planning conditions or Section 106 Agreements.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The Plan highlights the need for sustainable development. The objective of the policy is to minimise and where required mitigate noise impacts from new developments through development control management.

The Policy CS3 ('Strategy for Growth and Development') outlines the need for growth meaning that improvement to transport networks will be important.

Other

Babergh District Council: Local Plan (2006)

The Babergh Local Plan Alteration No.2 was adopted by the Council on 1 June 2006. It sets out the detailed policies and proposals for the control of development across the district.

Ipswich Borough Council: Public Open Space SPD (2017)

This SPD states that design and layout of the new development should ensure that excessive noise and visual intrusion will not disturb nearby residents.

Ipswich Borough Council: Ipswich Urban Character Area SPD (2015)

This SPD provides design guidance to support the implementation of adopted Core Strategy policies CS2, The Location and Nature of Development, and DM5, Urban Design Quality. These policies aim to protect and enhance the special character and distinctiveness of Ipswich. The SPD does not cover the conservation areas within Ipswich, which already benefit from conservation area character appraisals.

Other relevant documents

Planning Practice Guidance: Noise (2014)

The PPG 2014 advises on how planning can manage potential noise impacts in new development.

General Principles of Environmental Assessment, Design Manual for Road and Bridges (2008)

The DMRB Volume 11, Section 3, Part 7, HD 213/11 Revision 1 sets out a methodology for assessing road traffic noise in terms of perceived nuisance. It sets the context for environmental impact assessment in relation to Strategic Environmental Assessment, Assessment of Implications on

European Sites and transport appraisal. It provides the general principles and guidance for undertaking environmental impact assessments and describes three levels of assessment.

British Standards 5228-1: 2009+A:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise

BS 5228-1 provides guidance on the measurement and prediction of construction noise and recommends basic methods of noise control where there is a need to protect persons working or living near, and those working on, construction and open sites.

British Standards 5228-2: 2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration

BS 5228-2 provides basic recommendations for vibration control where work on construction and open sites generates significant levels of vibration. It includes advice on methods for measuring and predicting vibration and assessing its potential effect on people and buildings.

British Standards 6472-1: 2008 Guide to Evaluation of Human Exposure to Vibration in Buildings. Part 1: Vibration Sources Other Than Blasting

BS 6472-1 provides guidance on the methods to assess the effects of environmental vibration on people in residential and other environments. The Standard is primarily concerned with vibration generated by permanent or long-term sources, such as railways or industry, and cross-references the guidance contained within BS 5228-2 for the assessment of vibration from construction sites.

Calculation of Road Traffic Noise (1988)

The former Department of Transport/Welsh Office technical memorandum CRTN sets out a standardised method for the calculation of noise from road traffic.The factors which may influence road traffic noise levels can be divided into three groups: road related factors - gradient and surface type; traffic related factors - flow, speed and the proportion of heavy goods vehicles; and propagation factors – the distance between the road and the receptor location and either the type of ground cover between the road and receptor location or the presence of screening (i.e. barriers or buildings).The propagation of noise is also covered in CRTN and can influence the noise levels that will be experienced at receptor locations.

AIR QUALITY /GREENHOUSE GASES

Legislation

The European Union (EU) Ambient Air Quality Directive (2008/50/EC)

The European Union (EU) Ambient Air Quality Directive (2008/50/EC) sets legally binding limit values for concentrations in outdoor air of key air pollutants that impact public health including nitrogen dioxide
(NO2) and small particles known as PM10 and PM2.5. The regulations also set a critical level for annual
mean nitrogen oxides (NOx) for the protection of vegetation.

Climate Change Act 2008

It is an Act of Parliament of the United Kingdom. The Act established the world's first long term legally binding framework to tackle the dangers of climate change. It created a new approach to managing and responding to climate change in the UK.

The Environmental Protection Act 1990

The Environmental Protection Act 1990 is an Act of the Parliament of the United Kingdom that as of 2008 defines, within England and Wales and Scotland, the fundamental structure and authority for waste management and control of emissions into the environment.

The Control of Pollution Act 1974

The Control and Pollution Act 1974 was introduced by the Government. It aims to deal with a variety of environmental issues, including waste on land, water pollution, noise pollution and the prevention of atmospheric pollution.

National Policy

NPPF

Paragraph 181 of the NPPF requires that planning policies and decisions should *"sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of AQMAs and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".*

NPSNN

The NNNPS addresses emissions of pollutants affecting air quality - specifically NO_x, NO_2 and PM_{10}. Paragraph 3.8 of the Policy considers that the impact of road development on aggregate levels of emissions are likely to be very small, however impacts of road development need to be seen against significant projected reductions in carbon emissions and improvements in air quality as a result of current and future policies to meet the Government's legally binding carbon budgets and the European Union's air quality limit values. The NNNPS addresses air quality and sets out the requirements for an applicant's assessment and the SoS's responsibilities in decision making and mitigation to address any significant effect considered a compliance risk with regard to the Ambient Air Quality Directive (2008/50/EC).

The Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland

The Strategy sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. For road traffic emissions, which are a focus of this assessment, the main pollutant of concern is NO_2.

Clean Growth Strategy

The Clean Growth Strategy was published by the Department for Business, Energy & Industrial Strategy (BEIS) in October 2017 and last updated on 16 April 2018. It sets out the policies and proposals that aim to accelerate the pace of "clean growth".

Road to Zero Strategy

The 'Road to Zero Strategy' sets out the Government's strategy for reducing emissions of the road transport sector.

The Air Quality Standards Regulations 2010 (as amended)

The Air Quality Standards Regulations 2010 (SI 2010, No.1001) (as amended) transpose the Ambient Air Quality Directive (2008/50/EC) into law in England. The SoS is responsible for ensuring limit value compliance. The UK is divided into 43 zones for reporting compliance and Suffolk is included in the Eastern zone which is compliant.

Regional Policy

The Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies

The Local Plan identifies the need for addressing issues of air quality. There is currently an AQMA – not within the Project boundaries - declared at Lime Kiln Quay / Thoroughfare / St John Street junction in Woodbridge. AQMA form material planning consideration in determination of planning applications in the affected areas.

Suffolk Minerals & Waste Local Plan (submitted in December 2018)

Highlights that the localised air quality problems are due mainly to vehicle congestion hot-spots in the country.

Air Quality Management Areas (AQMAs)

AQMA involve measuring air pollution and trying to predict how it will change in the next few years. The aim of the review is to make sure that the national air quality objectives will be achieved throughout the UK by the relevant deadlines. These objectives have been put in place to protect people's health and the environment. Although Air quality in Suffolk is generally good there are nine AQMAs where pollution caused by road traffic breaches the National Objective Limits.

Suffolk Climate Action Plan 3

In March 2017 Suffolk Climate Change Partnership published Suffolk Climate Action Plan 3 fostering business and community resilience, reducing carbon emissions and increasing local economic growth. This document replaces the second Plan, which was published in July 2012.

Local Policy

Ipswich Local Plan 2011-2031 (2017)

The Local Plan 2011-2031, commits to the improvement of air quality. Policy CS20 relates to key transport proposals and in-particular to proposals to address traffic issues in the Star Lane Gyratory, which is included within an AQMA. These proposals to relieve congestion could bring about improvements in local air quality and do not rely on the delivery of the Proposed Project. The Proposed Project would need to complement efforts to improve air quality, particularly within the AQMAs and would need to avoid creating a new AQMA or sustaining the existing.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The Local Plan 2011-2031 adopted in 2014 highlights the need for sustainable development. Policy CS15 ('Implementing Sustainable Development in Babergh') aims to protect air quality by seeking to reduce need for travel by car and to encourage communities to walk and cycle.

Babergh District Council: Rural Development and Core Strategy Policy CS11 SPD (2014)

The Council is preparing a Low Emissions Strategy Supplementary Planning Document (SPD). The SPD will provide additional guidance to policies contained in the Ipswich Local Plan adopted in

February 2017. The SPD will not set new policies, but it will be a material consideration in taking decisions on planning applications.

Creating Growth, Cutting Carbon, Making Sustainable Local Transport Happen (2011)

This document outlines the vision for a transport system that is an engine for economic growth while is also greener, safer and improves quality of life in communities. This document is part of the overall strategy to tackle carbon emissions from transport.

Other

International Policy - United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC objective is to "*stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.*" The UNFCCC drives international action on climate change. The UK has pledged to reduce GHG emissions under the Paris Agreement, as a part of a joint pledge by members of the European Union (EU). This provides an overarching commitment by the UK.

HISTORIC ENVIRONMENT

Legislation

The Planning (Listed Buildings and Conservation Areas) Act 1990

This Act relates to special controls in respect of buildings and areas of special architectural or historic interest. It also introduces Building Preservation Notices and authorisation procedures for works to be carried out on listed buildings.

The Ancient Monuments and Archaeological Areas Act 1979

The Ancient Monuments and Archaeological Areas Act 1979 aims to protect the archaeological heritage of England.

National Policy

NPPF

The NPPF aims to conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations.
It requires local planning authorities to set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. In doing so, the local planning authorities should recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance.

NPSNN

The NNNPS states that Appraisal of Sustainability accompanying this Policy recognises that some developments will have some adverse local impacts on cultural heritage. It states that the significance of these effects and the effectiveness of mitigation is uncertain at the strategic and non-locational specific level of this NNNPS. Therefore, it suggests that whilst applicants should deliver developments in accordance with Government policy and in an environmentally sensitive way, including considering opportunities to deliver environmental benefits, some adverse local effects of development may remain.

The Infrastructure Planning (Decision) Regulations 2010

These regulations prescribe a list of matters to which the relevant decision-maker (either the Infrastructure Planning Commission or the SoS) must have regard when taking decisions on applications for nationally significant infrastructure projects. When deciding an application that affects (or its setting) a listed building, conservation area or scheduled monument, must have regard to the desirability of preserving or enhancing the character or appearance.

'A Green Future: Our 25 Year Plan to Improve the Environment'

The sixth of the 10 25-year goals of the plan is to achieve 'enhanced beauty, heritage and engagement with the natural environment'. The plan states that this will be done by 'safeguarding and enhancing the beauty of our natural scenery and improving its environmental value while being sensitive to considerations of its heritage'.

Regional Policy

Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies (2013)

The Suffolk Coastal District Local Plan (SCDLP) 2013 strongly supports the objectives of the NPPF which aim to conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations.

Local

Ipswich Local Plan (2011-2031): Core Strategy and Policies Development Plan Document Review (2017)

Ipswich Local Plan (ILP) 2011-2031 Policy CS3 ('IP-One Area Action Plan ('APP') states that the Council will prepare and implement an IP-One AAP incorporated in the Site Allocations and DPD to plan for significant change in central Ipswich. These AAP will identify heritage assets which development proposals will need to have regard to and integrate new development with the existing townscape.
Policy CS4 ('Protecting Our Areas') recognises that Ipswich has a rich and varied heritage of built, historical and natural assets, including more square miles of par per thousand population than anywhere else in the UK (approximately 600 listed buildings and structures). The Council is therefore committed to conserving and enhancing the Borough's built, heritage, natural and geological assets. The Council will conserve and enhance the character and appearance of conservation areas.
Policy DM5 ('Design and Character') states that the Council will require all new developments to be well designed and sustainable. Policies DM8 ('Heritage Assets and Conservation') and Policy DM9 ('Buildings and Structures of Townscape Interest') highlights the importance of applying specific criteria where new developments affect Designated or Non-Designated Assets, Conservation Areas, Archaeology but also may impact on the structures and buildings of townscape interest.

Ipswich Local Plan (2011-2031): Core Strategy and Policies Development Plan Document Review (2014)

Policy CS4 ('Protecting Our Assets') sets out the Council's commitment to conserving and enhancing the Borough's built, heritage, natural and geological assets. This chapter in coordination with the Cultural Heritage and Ecology chapters ensures that the potential effects of the Proposed Project on the assets are assessed and mitigated and enhanced where relevant.

Babergh District Council – Local Plan 2006

The Policy CN04 notes that there are currently approximately 4,000 listed buildings in the Babergh District. They form an important part of its architectural and historic heritage, and their appearance and condition have a direct effect on the quality of the Babergh environment.

The Policy aims to protect and enhance the built and historic environment and encourage good quality design.

LANDSCAPE

Legislation

Environment Act 1995

There is a responsibility under Section 62 of the Environment Act 1995 to have regard for the purposes of the National Parks, which includes 'to conserve and enhance the natural beauty, wildlife and cultural heritage of the National Parks' (for Landscape, Cultural Heritage & Biodiversity)

National Policy

NPPF

The NPPF highlights the importance of design of the built environment. It states that good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people. The framework also states that the planning system should contribute to and enhance the natural and local environment including by protecting and enhancing valued landscapes.

NPSNN

The NPSNN specifically, to landscape, considers that projects should aim to minimise harm to the landscape (townscape) and provide reasonable mitigation where possible and appropriate. It also considers developments that are outside national designations, but which might affect them and advises that projects should avoid compromising the purposes of the designation and be designed sensitively considering relevant constraints. The Suffolk Coast and Heaths AONB lies within the south of the Study Area and the potential effects of the Proposed Project on its special qualities and reasons for designation will be assessed.

'A Green Future: Our 25 Year Plan to Improve the Environment'

The sixth of the 10 25-year goals of the plan are to achieve 'enhanced beauty, heritage and engagement with the natural environment'. The plan states a desire to ensure that England's most beautiful landscapes are not only conserved but enhanced. The plan announces a review of National Parks and AONBs, to consider coverage of these designated areas, whether there is scope for expansion and opportunities to enhance the environment within these designations. The plan also states that action will be taken to identify 'opportunities for environmental enhancement in all of England's 159 National Character Areas and monitoring indicators of our landscape's character and quality to improve landscapes for people, places and nature'.

Regional Policy

The Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies (2013)

The Local Plan highlights the rich diverse of large assets including farmland, historic buildings and gardens which contribute to historic landscape. It intends to protect its landscape.

Suffolk Coastal Local Plan: Saved Policies (2013)

Saved Policy AP13 ('Special Landscape Areas') highlights that there are areas within Suffolk with special landscape attributes, which are particularly vulnerable to change. Saved Policy no. AP13

('Special Landscape Areas') states that *'The valleys and tributaries of the Rivers Alde, Blyth, Deben, Fynn, Hundred, Mill, Minsmere, Ore and Yox, and the Parks and Gardens of Historic or Landscape Interest are designated as Special Landscape Areas and shown on the Proposals Map. The District Council will ensure that no development will take place which would be to the material detriment of, or materially detract from, the special landscape quality'*. The Highway Route options cross this designation (see **Figure 2** in **Appendix A**); therefore, should Highway route option(s) be taken forward at OBC-stage, the Project will need to undertake further assessment to ascertain the physical impact of the Project on this feature and to identify potential mitigation measures to preserve the quality of this feature.

Local Policy

Ipswich Local Plan (2011-2031): Core Strategy and Policies Development Plan Document Review (2014)

Core Strategy Policy CS2 ('The Location and Nature of Development') sets out objectives for the regeneration and sustainable growth of Ipswich. It aims for high quality change, which safeguards the best of the town's urban character and neighbourhoods and secures positive improvements. This chapter utilises the SPD to set out the baseline townscape character for the Study Area, with the aims of Policy CS2 an integral part of the design and assessment process.

Development Management Policy DM5: ('Design and Character') requires that all new development to be well designed and sustainable which, relevant to this assessment means protecting and enhancing the special character and distinctiveness of Ipswich, including significant views that are recognised as being important and worth protecting, the setting of any nearby listed buildings, and helping to reinforce the attractive physical characteristics of local neighbourhoods and the visual appearance of the immediate streets scene.

Ipswich Borough Council: Rural Development and Core Strategy Policy CS11 (2014)

This SPD through Policy CS15 ('Implementing Sustainable Development in Babergh') highlights that new proposals must respect the landscape, landscape features, streetscape/townscape, historic assets, important spaces and historic views.

Ipswich Borough Council: Local List (Buildings of Townscape Interest) (2013)

This SPD was adopted in 2013. Following a review, revisions to the Local List were adopted on 27th July 2016. The revisions add eight properties to the list and revise the entries for two buildings currently on the list. The SPD supports the Council's Core Strategy policy DM9 Buildings of Townscape Interest and helps to further the Council's objective of preserving and enhancing the historic fabric and special character of Ipswich. The Council is looking to work in partnership with local communities for the 2019 review.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The Local Plan 2011-2031 highlights importance on careful consideration of visual impacts especially on the designated Conservation Areas.

Babergh District Council: Local Plan (2006)

The Local Plan Policy CN10 notes that the visual appearance of areas and buildings can be enhanced by the sympathetic location, size and design. Policy CN3 highlights that development leading to the loss of important open space, visually important gaps in the street scene or recreational facilities within towns and villages will not be permitted.

Policy EN19 ('Hazardous Installations and Contaminated Land') states that if contamination of land is known or where available evidence clearly indicates that contamination exists the applicant will be required to carry out a site-specific investigation and risk assessment. Planning permission will not be granted until detailed proposals for any necessary remediation of the site have been agreed.

Other

Ipswich Borough Council: Public Open Space (2017)

The SPD states that design and layout of the new developments should ensure that excessive noise and visual intrusion will not disturb nearby residents. New developments should comprise of an attractive landscape and urban environment.

Ipswich Borough Council: Local List (Buildings of Townscape Interest) (2013)

This SPD supports the Council's Core Strategy policy DM9 Buildings of Townscape Interest and helps to further the Council's objective of preserving and enhancing the historic fabric and special character of Ipswich.

BIODIVERSITY

Legislation

The Natural Environment and Rural Communities (NERC) Act 2006 (as amended)

The Natural Environment and Rural Communities Act 2006 (NERC) was the Act of Parliament that established Natural England by merging English Nature, the Rural Development Agency and the Countryside Agency. The Act makes provision in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species.

Environment Act 1995

There is a responsibility under Section 62 of the Environment Act 1995 to have regard for the purposes of the National Parks, which includes 'to conserve and enhance the natural beauty, wildlife and cultural heritage of the National Parks' (for Landscape, Cultural Heritage & Biodiversity).

The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 is an Act of Parliament in the United Kingdom implemented to comply with European Council Directive 2009/147/EC on the conservation of wild birds. It gives protection to native species, controls the release of non-native species, enhances the protection of Sites of Special Scientific Interest and builds upon the rights of way rules in the National Parks and Access to the Countryside Act 1949.

National Policy

NPPF

The NPPF states that planning system should contribute to and enhance the natural and local environment.

NPSNN

The NPSNN highlights the importance of protecting and improving natural environment while delivering critical infrastructure.

It states that where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside

England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems. It requires the applicant to show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.

'A Green Future: Our 25 Year Plan to Improve the Environment'

The third of the 10 25-year goals of the plan is to achieve 'thriving plants and wildlife'. On land and freshwaters, the plan states that this goal will be achieved by restoring 75% of protected sites to favourable condition, creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network (including a focus on priority habitats as part of a wider set of land management changes), taking action to recover threatened, iconic or economically important species and increase woodland in England in line with an aspiration of 12% cover by 2060.

The plan states that it will seek to embed a 'net environmental gain' principle for development to deliver environmental improvements locally and nationally. While current policy is that the planning should provide biodiversity net gains where possible, it will be explored whether this requirement can be strengthened to other areas and the government will consult on making this mandatory. The plan's actions to assist the recovery of nature includes the development of a 'Nature Recovery Network' that will deliver on the recommendations in 'Making Space of Nature' (2010) for landscape scale conservation. The plan's aspirations for woodland planting includes increased tree planting while also supporting increased protection of existing trees and forests. The plan also supports for the planting of a new 'Northern Forest' using the M62 as its spine.

Regional Policy

Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies (2013)

The Suffolk Coastal District Local Plan (SCDLP) 2013 aims to assist the NPPF in contributing to conserving and enhancing the natural environment. Strategic Policy 14 – SP14 ('Biodiversity and Geodiversity') states that biodiversity and geodiversity will be protected and enhanced using a framework based on a network of designated sites, wildlife corridors and links, the rivers, estuaries and coast, identified habitats and geodiversity features, landscape character areas and protected species.

Suffolk Biodiversity Action Plan (2012)

This plan covers forward plans including local planning documents, Shoreline Management Plans and Local Authority coastal defence planning and Areas of Outstanding Natural Beauty (AONB) management plans.

Local Policy

Ipswich Local Plan 2011-2031: Core Strategy and Policies Development Plan Document Review (2017)

The Ipswich Local Plan (ILP) 2011-2031 highlights the importance of protecting natural environment together with specific Policy DM31 ('The Natural Environment') which states that all development proposals are expected to incorporate measures to enhance conditions for biodiversity within and around the development.

Ipswich Borough Council: Ipswich Urban Character SPD (2015)

The Urban Character SPD provides design guidance to support the implementation of adopted Core Strategy policies CS2, The Location and Nature of Development, and DM5, Urban Design Quality. These policies aim to protect and enhance the special character and distinctiveness of Ipswich. The SPD does not cover conservation areas.

Ipswich Borough Council: Reptile SPD (Draft)

The Council is preparing a Reptile SPD. The SPD will provide additional guidance to policies contained in the Ipswich Local Plan (currently the Core Strategy and Policies development plan document 2011 and remaining saved policies of the Ipswich Local Plan 1997). The Reptile Strategy SPD will set out an approach to the translocation of reptiles as a form of mitigation for development impacts. The draft SPD will need to be published for public consultation.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The Babergh District Council Local Plan (BDC LP) 2011-2031 highlights that the environment in all its forms (including landscapes, the estuarial coast and biodiversity, etc.) will be conserved to protect the district's environment.

Babergh District Council: Local Plan 2006

The Policy EN08 ('Stour and Orwell Estuaries') highlights the unique character and ecology of the Stour and Orwell estuaries and their landscape setting which District Council aims to safeguard= and conserve through the strict control of development.

DRAINAGE & WATER ENVIRONMENT

Legislation

The Flood and Water Management Act 2010

The Flood and Water Management Act 2010 created the role of the Lead Local Flood Authority (LLFA) (in this case Suffolk County Council) to take responsibility for leading the co-ordination of local flood risk management in their areas. In accordance with this Act, the Environment Agency (EA) is responsible for the management of risks associated with main rivers, the sea and reservoirs.

The Groundwater Directive (2006/118/EC)

Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

The Water Framework Directive (2000/60/EC)

The overall objective of the Water Framework Directive (WFD) is to bring about the effective co-ordination of water environment policy and regulation across Europe. The main aims of the legislation are to ensure that all surface water and groundwater reaches 'good' status (in terms of ecological and chemical quality and water quantity, as appropriate), promote sustainable water use, reduce pollution and contribute to the mitigation of flood and droughts.

The WFD also contains provisions for controlling discharges of dangerous substances to surface waters and groundwater and includes a 'List of Priority Substances'. Various substances are listed as either List I or List II substances, with List I substances considered the most harmful to human health and the aquatic environment. The purpose of the directive is to eliminate pollution from List I substances and reduce pollution from List II substances.

National Policy

NPPF

Section 14 'Meeting the challenge of climate change, flooding and coastal change' of the NPPF states that 'inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk'. Paragraph 163 states that when determining any planning application, local planning authorities should ensure that flood risk is not increased elsewhere.

NPSNN

Paragraph 5.96 advises that applicants for projects which may be affected by, or may add to, flood risk to seek sufficiently early pre- application discussions with the EA, and, where relevant, other flood risk management bodies such as lead local flood authorities, Internal Drainage Boards (IDBs), sewerage undertakers, highways authorities and reservoir owners and operators. Paragraph 5.97 states that surface water flood issues need to be understood and then account of these issues can be taken. The NPSNN states that in decision-making, the SoS will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the WFD.

'A Green Future: Our 25 Year Plan to Improve the Environment'

The third of the 10 25-year goals of the plan is to achieve 'clean and plentiful water'. The plan states that this will be achieved by several actions, including reaching or exceeding objectives for rivers, lakes, coastal and ground waters that are specially protected'. The plan also looks to put in place more sustainable drainage systems, which it will do through amending planning practice guidance to clarify construction and ongoing maintenance arrangements for sustainable drainage system (SuDS) in new developments and considering changes to the NPPF and Building Regulations in the longer term to encourage SuDS.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (2000/60/EC)

These Regulations make provision for the purpose of implementing in river basin districts within England and Wales Community legislation in the field of water-related environment and more generally water management-related issues. Among other things, require the identification of river basin districts, and a number of other assessments to be carried out by the EA to characterise and classify the status of water bodies in those.

Regional Policy

Anglian River Basin Flood Risk Management Plan 2015-2021(2016)

Significant water management issues are identified in the Anglian River Basin Management Plan (ARBMP) which are defined as:

- Physical modifications (affecting 51% of water bodies in the river basin district);
- Pollution from waste water (affecting 50% of water bodies in this river basin district);
- Pollution from towns, cities and transport (affecting 10% of water bodies in this river basin district); and
- Changes to the natural flow and level of water (affecting 10% of water bodies in this river basin district).

Suffolk Flood Risk Management Strategy (2016)

The Suffolk Flood Risk Management Strategy (FRMS) was published by Suffolk Flood Risk Management Partnership, which consists of county and district councils, IDBs, EA, Anglian Water, Highways England and several other institutions and authorities.

The FRMS identifies key areas of flood risk from surface water, groundwater and fluvial sources in the county and proposed management strategies to reduce this risk.

The Strategy provides an appropriate guidance and protocol for local planning authorities and developers on SuDS, Surface Water Drainage and Local Flood Risk in Suffolk.

Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies (2013)

The Suffolk Coastal District Local Plan (SCDLP) 2013 set out the vision and strategy for development in the district to 2027. The SCDLP 2013 intends to protect the areas and minimise risks from flooding and ensuring appropriate management of land within flood plains.

East Suffolk Catchment Flood Management Plan (2009)

Ipswich falls within Flood Risk Management Policy 5 which is classified as an area of moderate to high flood risk where generally further action can be taken to reduce flood risk.

This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

Local Policy

Ipswich Local Plan 2011-2031: Core Strategy and Policies Development Plan Document Review (2017)

The ILP 2011 – 2031 highlights that the key challenges for the Ipswich LP is to manage flood risk, increasing resilience and adapting to climate. The Ipswich LP 2011-2031 states that its objective is to enhance flood protection including a tidal surge barrier to be in place to protect the town's existing and expanding communities from the threat of tidal flooding. Policy DM4 ('Development and Flood Risk') states that development will only be approved where it can be demonstrated that the proposal satisfies the criteria of that policy.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The key objective of the Council to ensure that key environmental issues are addressed is to ensure efficient use and protection of the quality of scarce resources, particularly water and the water environment.

Babergh District Council: Local Plan (2006)

The objective of the Babergh District Council Local Plan (BDC LP) 2006 is to ensure that the water quality and water resources of the District are protected. It highlights that development proposals in flood risk areas will be determined with the help of supplementary planning guidance in order to allow for periodic updates, the acquisition of new information, the evolution of new approaches and changing circumstances, such as climate change.

The Policy E11 ('Protection of Floodplains and Washlands') EN11 states that in areas at risk from flooding, as shown on the EA's current Indicative Floodplain Maps, or as identified through other sources, proposals for new development or the intensification of existing development in undefended areas will be refused, unless the development itself and any other affected areas are adequately protected from flooding to at least the minimum standard required by PPG25 for the lifetime of the development and no increased flood risk will occur elsewhere.

Other

Groundwater Protection Technical Guide (2017)

The EA is the statutory body responsible for the protection and management of groundwater resources in England. The groundwater protection guides published in March 2017 set out the framework for the EA regulation, and replace Groundwater Protection: Principles and Practice GP3. In summary, Section C sets out the EA's position statements and approach to managing and protecting groundwater in relation to infrastructure developments.

Ipswich Borough Council: Public Open Space SPD (2017)

This SPD highlights importance of protecting of ground water quality within public open spaces. It outlines that use of Sustainable Urban Drainage Systems (SuDS) is a key in delivering public benefits.

Ipswich Borough Council: Development and Flood Risk SPD (2017)

This SPD states that development will only be approved where it can be demonstrated that appropriate SuDS is in place. It urges that development should remain safe for people for the lifetime.

Ipswich Borough Council: Space and Design Guidelines SPD (2015)

This SPD also highlights the importance of implementing the SuDS for surface water drainage through design of the new development.

Sustainable drainage systems: non-statutory technical standards (2015)

The standards published by DEFRA in March 2015, set out the core technical standards for SUDS proposed within England. These standards should be used in accordance with the NPPF and PPG. The standards include guidance on controlling flood risk within a development boundary and elsewhere, peak flow and runoff volume control, and the structural integrity of SUDS.

TRANSPORT

Legislation

The Highways Act 1980

The Highways Act 1980 is an Act of the Parliament of the United Kingdom which deals with the management and operation of the road network in England and Wales.

National Policy

NPPF

One of the planning principles of the NPPF is to actively manage patterns of growth and focus significant development in locations which are or can be made sustainable.

The NPPF highlights that when promoting sustainable transport encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. It states that local planning authorities should work with neighbouring authorities and transport providers to develop

strategies for the provision of viable infrastructure necessary to support sustainable development. including transport investments necessary to support strategies for growth of ports, airports and other major generators of travel demand in their areas. The primary function of roadside facilities for motorists should be to support the safety and welfare of the road user.

The NPPF requires all developments that generate significant amounts of movement to be supported by a Transport Statement (TS) or Transport Assessment (TA). It outlines that local planning authorities should identify and protect, where is robust evidence, sites, routes which could be critical in developing infrastructure to widen transport choice.

NPSNN

The NPSNN makes it clear that the national road network is already under significant pressure highlighting that it is estimated that around 16% of all travel time in 2010 was spent delayed in traffic, and that congestion has significant economic costs. In 2010 the direct costs of congestion on the SRN in England were estimated at £1.9 billion per annum.

The NNNPS therefore highlights the need for development of the National Road Network (NRN) which connect towns, cities and regions. There is a critical need to address congestion issues to provide safe and resilient networks.

The NPSNN aims for sustainable development through delivering of sustainable transport. It notes that the pressure on the NRN is predicted to increase as the long-term drivers for demand to travel, GDP (Gross Domestic Product) and population, are also forecast to increase.

The NNNPS aims to help achieving the Government's commitment to creating a more accessible and inclusive transport network that meet the country's long-term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system.

Regional Policy

The Suffolk Coastal District Local Plan: Core Strategy & Development Management Policies (2013)

The SCDLP 2013 aims to improve transport, environmental and community infrastructure to support growth in the region. It identifies transport and accessibility as a key economic issue and aims to tackle poor access to jobs, both in terms of the quality of the transport system; the efficient functioning of the A14 as an important international and local transport route.

Strategic Policy 1 ('Sustainable Development') aims to reduce the overall need to travel but where travel is necessary, to better manage the transport network to enable it to function efficiently.

Strategic Policy SP10 ('A14 & A12') highlights that the A14 is an important route on the European map providing a link from the Port of Felixstowe to the remainder of the UK and its markets.

Suffolk Local Transport Plan 2011 – 2031 (2011)

The Suffolk Local Transport Plan (SLTP) 2011 – 2031 outlines Suffolk Council objectives for transport in the County.

It is a 20-year strategy that highlights the Suffolk Council long-term ambitions for the transport network. It is formed of two parts, the first part being a main strategy and the second part being the four-year implementation plan indicating how Suffolk Council proposes to address the issues identified within the longer-term transport strategy. The SLTP 2011 – 2031 recognises the challenges of balancing policies to work for both the largely rural areas of Suffolk and the urban centres.

Suffolk Minerals & Waste Development Framework: Minerals Core Strategy (2008)

Policy P6 of the Minerals Core Strategy (MCS) 2008 states that when proposals are considered which would result in the loss of an existing port or rail handling facility, applicants will be required to demonstrate that those sites no longer meet the needs of the aggregates industry. Where this is not the case, satisfactory alternative handling facilities should be made available by the developer. Development proposals in close proximity to rail or port handling facilities should demonstrate that they would not prejudice or be prejudiced by those facilities.

Local Policy

Ipswich Local Plan 2011-2031: Core Strategy and Policies Development Plan Document Review (2017)

The Ipswich Local Plan (Ipswich LP) 2011-2031 states that a vital element of sustainable development is where to locate new development so that people can easily access the jobs, goods and services they want and need, by the most sustainable modes of travel.

The Policy CS2 ('The Location and Nature of Development') highlights that new development must benefit the environment and health by reducing vehicular emissions, and the economy by reducing congestion. The Policy CS5 ('Improving Accessibility') states that there is a need for optimising the accessibility of new developments without increasing the congestion, where Policy C17 ('Delivering Infrastructure') highlights that for development to take place in an appropriate manner, it is essential to give consideration to the infrastructure needs associated with the levels of development proposed. The

Ipswich Borough Council: Low Emissions Strategy SPD (Draft) (2017)

The scope of this draft SPD relates to mitigating emissions from transport related to new development, considering use and types of vehicles, the role of walking, cycling and public transport and the role of trees and vegetation in absorbing pollutants.

Babergh District Council Local Plan 2011-2031: Core Strategy and Policies (2014)

The Babergh District Council Local Plan (BDC LP) 2011-2031 highlights the need for sustainable development. In terms of transport issues, the district's very rural nature is expected to continue limiting potential for more sustainable travel modes in the future, (except in the towns) although travel plans will be sought for larger developments and protection of existing local facilities together with encouragement for new such facilities which will help to reduce their adverse impacts.

The Policy CS3 ('Strategy for Growth and Development') outlines the need for growth meaning that improvement to transport networks will be important. Policy CS15 ('Implementing Sustainable Development in Babergh') seeks to improve and provide access to services.

Babergh District Council: Rural Development and Core Strategy Policy CS11 SPD (2014)

This SPD highlights the importance of improving accessibility across the district and refers to Policy CS15 ('Implementing Sustainable Development in Babergh') stating that developments must seek to minimise the need to travel by car using the following hierarchy: walking, cycling, public transport, commercial vehicles and cars thus improving air quality and where appropriate to the scale of the proposal provide a transport assessment / travel plan.

Babergh District Council: Local Plan (2006)

The Policy aims to encourage an effective and efficient transport system that provides greater opportunities for choice, for all members of the community; and to balance the needs of the car against the needs of public transport and non-motorised users such as cyclists and pedestrians. It aims to reduce the environmental impact of travel and to limit the growth of road traffic.

Other

National Infrastructure Plan (2014)

The National Infrastructure Plan (NIP) 2014 is based on the principle that high quality infrastructure boosts productivity and competitiveness, allowing businesses to grow and enabling them to reach suppliers, deepen labour and product markets, collaborate and innovate, and attract inward investment. The NIP 2014 therefore recognises the role of the Government in funding improvements to the SRN and aims to transform the nation's road network over the next 25 years. Furthermore, NIP 2014 highlights that local roads which are not a component of the SRN, are also crucial to the successful operation of the transport system and that local planning authorities are responsible for managing, maintaining and improving the overall local road network.

Creating Growth, Cutting Carbon, Making Sustainable Local Transport Happen (2011)

This document outlines the vision for a transport system that is an engine for economic growth while is also greener, safer and improves quality of life in communities. This document is part of the overall strategy to tackle carbon emissions from transport. It puts forward many reasons why making transport more sustainable has multiple benefits across a wide range of factors and that it is important that all factors are considered when planning transport.

Appendix G

CONSENT ROUTE MEMO

This note identifies possible consenting routes and suggested planning strategy for the proposed Ipswich Northern Route (INR) Project based on information included in this report.

The INR Project comprises the construction of a northern strategic link road between the A14 and the A12. There are currently five options proposed within three route corridors as presented in Table-1. The locations of the proposed highway route options are shown on the Appendix A. The proposed highway route options are anticipated to be dual carriageway.

Routes to Consent

It is considered that all three corridor options for INR will constitute 'development' as defined under section 55(1) of the Town and Country Planning Act 1990 (as amended) (TCPA 1990) and require a full application for planning permission for carrying out any development as per section 57(1) of the TCPA 1990 or development for which development consent is required as per subsection 57(1A) of the TCPA 1990. Section 55 of TCPA 1990 defines development as *'carrying out of engineering […] or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land'.*

The proposed corridor options have been considered against the powers granted to statutory Highway Authorities under the Town and Country Planning (General Permitted Development) (England) Order 2015 (GDPO 2015). GPDO 2015 allows for certain types of development to be carried out without a need for a planning permission. The relevant permitted development rights for Highway Authorities are set out under Part 9 of the GPDO 2015. Part 9, Class A defines 'permitted development' as *'carrying out by a highway authority […] of any works required for maintenance or improvement of the road […].* As the Proposed Project involves the construction of a new road and not the maintenance, or improvement of an existing road it will not fall within Part 9, Class A of the GDPO and as such, planning permission will be required.

In 2008, Planning Act 2008 (as amended) (PA 2008) was introduced to streamline the processes for examining and obtaining consents for the delivery of Nationally Significant Infrastructure Projects (NSIPs) in England and Wales including transport infrastructure. Section 14(1)(h) of the PA 2008 defines 'highway-related' developments and the thresholds for a highways project to be considered an NSIP are defined under section 22 of the PA 2008 as amended. As per section 22 of the PA 2008 the Proposed Project could be considered as an NSIP as it is most likely to involve *'a construction of a highway […]; constructed wholly in England […] and the area of development is greater 12ha; where the speed limit for any class of vehicle is expected to be 50mph or greater.'*.

However, section 22 only applies if the Secretary of State is the highways authority for the road, therefore the Project would not automatically constitute an NSIP as Suffolk County Council are the highways authority.

Proposed consenting strategy

There are two consenting routes available to Suffolk County Council for the INR development. These are:

- Town and Country Planning Act 1990 (as amended); and
- Planning Act 2008 (as amended)

The Town and Country Planning Act 1990 (as amended)

Full planning permission for the proposed INR Project can be obtained from the relevant local planning authority as per section 55 of the TCPA 1990.

It should, however, be noted that this consenting route will only provide Suffolk County Council with planning permission for the development of land. Other relevant licenses, permissions or compulsory purchase powers will have to be obtained separately. All other necessary requisite consents such as environmental licences, consents, permissions, and agreements will need to be

obtained through separate processes under different regimes following the grant of planning permission. Taking into consideration the scale of the proposed INR Project, obtaining all other supporting consents, licences, and agreements could be challenging, time consuming, and add significant risks to the project.

Planning Act 2008 (as amended)

It is recommended, subject to legal advice that Suffolk County Council should opt for obtaining a Development Consent Order (DCO) under the PA 2008 for the proposed INR Project. This is because there are significant advantages of seeking consent through the PA 2008 rather than through the TCPA 1990 in that the majority of relevant licences and powers, including Compulsory Acquisition, can be obtained under the DCO process, which provides Suffolk County Council with more assurances and fewer risks associated with obtaining separate licences and consents. Also, obtaining consent under the PA 2008 involves a front-loaded process which provides no time limits on how long Suffolk County Council takes in preparing and consulting on the Proposed Project during its pre-application stage. However, once the application is submitted for approval there are limited opportunities for making changes to the proposed INR development. This is no so for the TCPA 1990 process.

Furthermore, it should also be noted that although determination timescales under the PA 2008 are longer than TCPA 1990, the examination and determination periods under PA 2008 are fixed which gives the applicant more certainty in terms of the timescales and planning for delivery of the proposed development. Also, as the compulsory acquisition process forms part of the DCO process, rather than consecutively, the timescales overall for both consenting routes are similar.

It is therefore recommended that Suffolk County Council obtain a direction under section 35 of PA 2008 from the Secretary of State for the proposed INR Project to be treated as development for which development consent is required. As the proposed INR meets all of the criteria in section 22(2) of the PA 2008 save for the highway authority being the Secretary of State, it would be possible to present a case to support the Project being treated as an NSIP (i.e. supports economic growth for Ipswich for delivering of access/transport to existing and proposed housing and business developments, requires multiple consents and acquisition of land).

The relevant SoS (in this case the SoS for Transport) and not the relevant local authority will make a decision on the DCO and will assess the NSIP against the National Networks National Policy Statement (NPS) prepared by the Government. The need for an NSIP is already supported by the National Networks NPS.

We note that Suffolk County Council has already used the same approach for Lake Lothing Third Crossing and therefore is familiar with this process.

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