Lower Thames Crossing

6.3 Environmental Statement Appendices Appendix 7.3 – Area of Search and Zone of Theoretical Visibility Analysis

APFP Regulation 5(2)(a)

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

Volume 6

DATE: October 2022

Planning Inspectorate Scheme Ref: TR010032
Application Document Ref: TR010032/APP/6.3

VERSION: 1.0

Lower Thames Crossing

Appendix 7.3 – Area of Search and Zone of Theoretical Visibility Analysis

List of contents

Page number

1 Introduction

1.1.1 This appendix sets out the initial ‘area of search’ used to help determine the extent of the study area for the landscape and visual impact assessment of the A122 Lower Thames Crossing (the Project). This is followed by a summary of the Zone of Theoretical Visibility (ZTV) analysis undertaken to support the definition of the study area for the landscape and visual impact assessment.

1.1.2 The process for defining the study area is described in Chapter 7: Landscape and Visual (Application Document 6.1). This process was carried out to identify a study area that was proportionate to the type of development as well as anticipated significant landscape and visual effects. While the Project may theoretically be visible from beyond the study area, significant landscape or visual effects are not considered likely.

1.1.3 The process of determining the study area follows recommended best practice guidance in the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (Landscape Institute and Institute of Environmental Management and Assessment (IEMA), 2013) and is informed by professional judgement.

2 Desk-based study

2.1.1 The process for determining the extent of the study area began with a desk-based study of the area of search. This involved the preparation of a ZTV for the Project road, initially undertaken prior to the preparation of the Preliminary Environmental Information Report at Statutory Consultation.

2.1.2 As agreed with stakeholders (Chapter 7: Landscape and Visual, Table 7.2 (Application Document 6.1)), this ZTV analysis extends up to 5km from the Project road. This is considered to be proportionate to the geographical extent of landscape and visual effects arising from the Project. In line with the GLVIA3 recommendations, this ZTV analysis was modelled on a Digital Terrain Model (DTM), or 'bare-earth' model, which did not take account of existing buildings or vegetation. This is considered appropriate as it presents a worst-case scenario and therefore a theoretical maximum extent of visibility, because the ZTV does not take account of any intervening screening features.

2.1.3 This analysis has been updated to take account of the Project route at Development Consent Order (DCO) submission, with a slightly broader 6km ZTV analysis undertaken to ensure that the full 5km area of search is considered and presented. This covers the following Project road sections defined in Figure 2.4: Environmental Masterplan (Application Document 6.2):

a. Section 1: M2 junction 1
b. Section 2: M2/A2/A122 Lower Thames Crossing junction
c. Section 3: Gravesend link and South Portal
d. Section 9: North Portal
e. Section 10: Chadwell St Mary link
f. Section 11: A13/1089/A122 Lower Thames Crossing junction
g. Section 12: Ockendon link
h. Section 13: A122 Lower Thames Crossing/M25 junction
i. Section 14: A122 Lower Thames Crossing/M25 junction

2.1.4 In summary, the ZTV analysis shown in Figure 7.10 (Application Document 6.2) identifies the following visibility.

2.1.5 To the south of the River Thames, there is extensive theoretical visibility of Sections 1 (M2 junction 1), 2 (M2/A2/A122 Lower Thames Crossing junction) and 3 (Gravesend link and South Portal). To the east, visibility extends to elevated land at Cliffe Wood and includes the areas of Shorne and Higham, but beyond these areas, to the south-east, it is more intermittent with a clear delineation at the elevated ridgeline along the A289. To the south, it is largely focused within the immediate 2km extent with perception to the south-west extending up to the 5km extent and incorporating Sole Street, Meopham, Meopham Green and New Barn as a result of elevated ground. To the west, visibility covers large expanses of the Gravesend urban areas. In addition, it is acknowledged that Section 3 is theoretically perceptible to the area north of the River Thames, within the Tilbury Marshes and up to the West Tilbury escarpment.

2.1.6 To the north of the River Thames, there is extensive theoretical visibility of Section 9 (North Portal). This extends up to the 5km extent in the east with large areas of Linford and East Tilbury included and with increased intermittence at Stanford-le-Hope and Mucking. To the south, visibility is expansive within the Tilbury Marshes and it is acknowledged that there is theoretical perception of this section to the areas south of the River Thames, especially within the Shorne Marshes and on the Shorne rising slopes to the local ridgeline at the edge of Riverview Park/Thong Lane. To the west, visibility is also expansive covering West Tilbury, Tilbury and the southern and eastern edges of Chadwell St Mary.

2.1.7 Continuing northwards, there is more restricted theoretical visibility of Section 10 (Chadwell St Mary link) with the extent focused within 2km in most directions. To the east, visibility is expansive and continues up to the 5km extent and includes the settlements of Stanford-le-Hope, Linford and East Tilbury. To the south and east, visibility is more constrained, limited to within 1-2km, with West Tilbury and Chadwell St Mary forming the edge of the extent of visibility. To the north, visibility is largely limited to the A13 and A1013 as a result of highway embankments. A degree of visibility occurs on the southern edge of Orsett.

2.1.8 In Section 11 (A13/1089/A122 Lower Thames Crossing junction), visibility becomes more expansive as a result of the elevated nature of the road at this location. Here visibility theoretically extends up to the 5km extent in the north as a result of the low-lying topography of the Orsett Fen landscape and includes the village of Orsett. To the east, visibility extends up to 2km and includes the settlement of Southfields and the western edge of Linford. To the south, visibility extends 1-2km and includes the urban edge of Chadwell St Mary, Little Thurrock and North Stifford to the south-west. To the west, visibility extends approximately 3km to include the eastern urban edge of North Ockendon.

2.1.9 Further northwards, as the Project road passes through the Orsett Fen landscape in Section 12 (Ockendon link), visibility is varied as a result of the local landscape. To the north, given the low-lying nature of the landform which is surrounded by rising topography to the north and east, visibility extends up to and beyond distances of 5km with theoretical visibility possible from the Thorndon Country Park to the north and Langdon Hills to the east. These directions include the settlements of West Horndon, Bulphan and Horndon-on-the-Hill. To the south-east, south and south-west, theoretical visibility is limited to a 3km extent and includes the settlement of Orsett and the urban edges of North Stifford and Little Thurrock. Visibility of this section includes a large expanse of the Mardyke Way which follows the Mardyke from the south-west to north-east, crossing the Project route. To the west, visibility is largely limited to the B186 (North Road) and excludes the settlements of South Ockendon and North Ockendon.

2.1.10 In Sections 13 and 14 (A122 Lower Thames Crossing/M25 junction), visibility is generally expansive in easterly, southerly and westerly directions extending up to 5km from the Project road. To the north, visibility is contained and limited to the immediate extent of the route. To the west, the recreational assets of Ingrebourne Valley Nature Park, Hornchurch Country Park and Belhus Woods Country Park are largely outside the extent of visibility. The urban areas and settlements of North Ockendon, South Ockendon and Upminster all fall within the extent of visibility.

2.1.11 As identified, visibility is varied along the extent of the Project route given its 23km length and varying topography, landform and character. In support of Chapter 7: Landscape and Visual (Application Document 6.1) submitted as part of the DCO application, additional ZTV analysis has been completed at a range of scales, based on both DTM and Digital Surface Models (DSM).

2.1.12 The extent of ZTV analysis undertaken is detailed below. This has informed the selection of an appropriately refined study area for the assessment of landscape and visual impacts as a result of the Project, as described in Chapter 7: Landscape and Visual (Application Document 6.1).

3 ZTV modelling undertaken

3.1.1 The following section sets out the ZTV analysis rationale and explanation. The technical methodology for the preparation of the ZTVs is set out in Appendix 7.8: Technical Methodologies and includes the modelling data used.

3.1.2 The ZTV analysis undertaken for both the construction and operational phases of the Project aligns with the recommendations from stakeholder requests and has informed the selection of the refined study area. The analysis undertaken is summarised below. The ZTV shown in Figures 7.8 to 7.15 (Application Document 6.2) provides an indication only of the theoretical maximum extent to which the Project may be visible from the surrounding landscape.

3.2 Construction phase ZTV modelling

3.2.1 The construction aspects of the Project, including details of proposed phasing and construction activities, are set out in Chapter 2: Project Description (Application Document 6.1).

3.2.2 The various ZTVs prepared for construction activities are described below.

5km DTM for construction compounds ZTV

3.2.3 In addition to the construction of permanent features, the temporary construction compounds are also likely to be notable features. Construction compounds would be strategically placed across the extent of the Project to facilitate construction over the short- to medium-term period. All construction compounds would include contractor offices and welfare facilities, construction plant and machinery, vehicle parking and earthwork stockpiles. Additional operations include concrete batching plants and/or slurry treatment works (up to 25m in height). In addition, a number of construction compounds would require temporary and short-term tower cranes to facilitate construction.

3.2.4 The main construction compounds would typically be present over a medium-term period, and contain the largest equipment and infrastructure associated with the construction phase.

3.2.5 ZTVs for compounds have been prepared and presented up to a 5km extent based on a 5m DTM in Figure 7.8 (Application Document 6.2).

3.2.6 The ZTVs include individually prepared analysis for each construction activity of varying heights covering the anticipated operations (with appropriate zones established for each) to define the visibility of operations within the wider landscape (refer to Appendix 7.8: Technical Methodologies for further details on the heights considered).

3.3 Operational phase ZTV modelling

3.3.1 ZTVs have been prepared for the Project route at various scales, including the Project road's vertical alignment, overbridge structures and side roads, and vehicles travelling along the Project road and side roads.

5km DTM Project route ZTV

3.3.2 A ZTV extending up to 5km has been prepared based on a 5m DTM. The ZTV analysis considers Project route elements, including the vertical road alignment, (overbridge) structures and side roads, and vehicles travelling along the Project road.

3.3.3 This process has been undertaken for each section as presented in Figure 7.11 (Application Document 6.2) with an overview for the whole Project route presented in Figure 7.10 (Application Document 6.2).

3.3.4 This is considered to represent a worst-case situation given the DTM bare-earth model utilised with no surface features, such as existing built forms and vegetation.

2.5km DSM (including LiDAR data) Project route ZTV

3.3.5 A detailed ZTV covering a 2.5km extent has been prepared, based on a combined Light Detecting and Ranging (LiDAR) and 1m DSM base model, which takes account of existing retained vegetation and buildings as well as existing ground contours. The ZTV analysis considers Project route elements, including the vertical road alignment, (overbridge) structures and side roads, and vehicles travelling along the Project road.

3.3.6 This process has been undertaken for each section as presented in Figure 7.13 (Application Document 6.2) with an overview for the whole route presented in Figure 7.12 (Application Document 6.2).

3.3.7 This is considered to represent a realistic representation of the Project road visibility within the landscape without planting mitigation at Opening Year.

2.5km DSM (including LiDAR data) Project route ZTV with environmental mitigation measures

3.3.8 A detailed ZTV covering a 2.5km extent has been prepared, based on a combined LiDAR and 1m DSM base model, which takes account of existing retained vegetation and buildings as well as proposed ground contours. This has combined the Project route false cutting mitigation and other Project earthworks (including Chalk Park and Tilbury Fields). The ZTV considers the Project route elements, including the vertical road alignment, (overbridge) structures and side roads, and vehicles travelling along the Project road.

3.3.9 This process has been undertaken for each Project route section as presented in Figure 7.15 (Application Document 6.2) with an overview for the whole route presented in Figure 7.14 (Application Document 6.2).

3.3.10 This is considered to represent the Project route visibility within the landscape with mitigation at Opening Year.

5km DTM comparative overhead electrical infrastructure ZTV

3.3.11 In addition, a comparative ZTV for the overhead electrical infrastructure relocation has been prepared to inform the assessment.

3.3.12 During construction, certain sections of the existing overhead electrical infrastructure would require permanent relocation to facilitate construction of the Project route. Due to the nature of the existing infrastructure, a comparative ZTV has been prepared as presented in Figure 7.9 (Application Document 6.2) to show the extent of existing visibility, compared with the extent of visibility that would result from the proposed modifications.

References

Landscape Institute and Institute of Environmental Management and Assessment (IEMA) (2013). Guidelines for Landscape and Visual Impact Assessment. Third Edition (GLVIA3). Oxfordshire: Routledge.

If you need help accessing this or any other National Highways information, please call **0300 123 5000** and we will help you.

If you have any enquiries about this publication email **info@nationalhighways.co.uk**
or call **0300 123 5000***.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Printed on paper from well-managed forests and other controlled sources when issued directly by National Highways.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ

National Highways Company Limited registered in England and Wales number 09346363