national highways

A12 Chelmsford to A120 widening scheme

TR010060

6.3 ENVIRONMENTAL STATEMENT

APPENDIX 8.6 TECHNICAL ZONE OF THEORETICAL VISIBILITY METHODOLOGY

APFP Regulation 5(2)(a)

Planning Act 2008

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

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A12 Chelmsford to A120 widening scheme
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ENVIRONMENTAL STATEMENT

APPENDIX 8.6 TECHNICAL ZONE OF THEORETICAL VISIBILITY METHODOLOGY

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Application Document Reference	TR010060/APP/6.3
Author	A12 Project Team & National Highways

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CONTENTS

1 Introduction

1.1.1 This appendix presents the methodology used to generate the Zone of Theoretical Visibility (ZTV) illustrated on Figure 8.3 [TR010060/APP/6.2].

1.1.2 ZTV mapping has been generated in ArcGIS Pro2.8.1 using the 'Viewshed' tool under the 'Surface' section of the Spatial Analyst software extension. Viewsheds are used to display where there is theoretical intervisibility between designated target points along a proposed design scheme and the surrounding topography.

1.1.3 The ZTV analysis undertaken for this study is based on a 'bare earth' terrain model which only takes account of the screening provided by the existing topography and does not incorporate surface features, such as trees, woodland or buildings, which also could provide screening. As such, the theoretical extent of visibility thus generated represents a "worst-case scenario". The actual visibility of the proposed scheme is likely to have a lesser extent due to these intervening features not incorporated into the ZTV modelling.

1.1.4 Figure 8.3 - Zone of Theoretical Visibility and Viewpoints – Bare Earth, also shows the following elements to illustrate existing features within the landscape, identified at the time of modelling, that could contribute to screen parts of the proposed scheme from some locations:

- Buildings, based upon data obtained from OS MasterMap

- Blocks of trees and woodland identified in the National Forest Inventory (NFI). The NFI data does not include all trees but is focussed on woodland of at least 0.5ha and minimum 20m width

2 Topography layer

2.1.1 Two datasets have been used to run the Viewshed tool:

- A topography layer in raster format obtained by merging the Department for Environment, Food and Rural Affairs (Defra) 2m Light Detection and Ranging (LiDAR) Composite digital terrain model tiles within the full extent of Figure 8.3 [TR010060/APP/6.2]

- A dataset of target points representing points along the proposed scheme

2.1.2 The ZTV has been modelled assuming a person's viewing height of 1.7m above the surrounding topography. This is in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013), which suggests ZTV mapping should assume that the observer eye height is 1.5m – 1.7m above ground level. The application of 1.7m assumes worst case visibility.

3 Point dataset/target points

3.1.1 The following ZTV scenarios have been generated:

- ZTV of target points representing Heavy Goods Vehicles (HGVs)

- ZTV of target points representing lighting columns and gantries

3.1.2 The target points representing HGVs have been taken at 100m intervals along the proposed scheme centreline and have been assigned a height of 4.5m above the level of the proposed carriageway to represent the height of high-sided vehicles using the roads.

3.1.3 Target points of 12m above the level of the proposed carriageway have been used to represent the height of lighting columns at major proposed junctions.

3.1.4 Target points of 12m above the level of the proposed carriageway have been used to represent the height of gantries.

4 Theoretical extent of visibility

4.1.1 The final output of the ZTV mapping is a raster recording the number of times that each cell location in the input surface raster can be seen from the input target points and, vice versa, the number of target points visible from each cell location. The observation frequency is recorded in the VALUE item in the output raster's attribute table. A symbology has been applied to the output raster dataset, grouping 0 values alone to represent areas with no theoretical visibility, and values equal or higher than 1 together, to represent areas with theoretically visibility.

4.1.2 The ZTV does not account for any variation that may result from the limits of deviation applied to the proposed scheme. The vertical and horizontal alignment, and the location of lighting and gantries, has been based on set alignment and design data. Any potential refinements of the proposed A12 design may result in changes to the vertical or horizontal alignment of the target points used to model each scenario, and therefore the ZTV of the proposed scheme.

References

Landscape Institute and Institute of Environmental Management and Assessment (2013).
Guidelines for Landscape and Visual Impact Assessment, Third Edition. Oxon: Routledge.