

A428 Black Cat to Caxton Gibbet improvements

TR010044

Volume 6

6.3 Environmental Statement

Appendix 7.2: Landscape and Visual Impact Assessment
Methodology and Study Area

Planning Act 2008

Regulation 5(2)(a)

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

26 February 2021

Infrastructure Planning

Planning Act 2008

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

**A428 Black Cat to Caxton Gibbet
improvements
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**Appendix 7.2: Landscape and Visual Impact Assessment Methodology
and Study Area**

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Table of contents

Chapter		Pages
1	Landscape and visual impact assessment methodology and study area	1
1.1	Introduction	1
1.2	Assessment methodology	1
1.3	Establishing the study area	19
1.4	References	20

Table of Tables

Table 1-1: Landscape value criteria.....	9
Table 1-2: Susceptibility to change of landscape receptors.....	10
Table 1-3: Landscape sensitivity.....	11
Table 1-4: Value of views.....	11
Table 1-5: Susceptibility to change of visual receptors.....	13
Table 1-6: Criteria for visual sensitivity.....	13
Table 1-7: Magnitude and nature of effect on the landscape.....	15
Table 1-8: Magnitude of visual effect.....	16
Table 1-9: Significance categories and descriptions.....	17
Table 1-10: Significance categories and descriptions.....	17

1 Landscape and visual impact assessment methodology and study area

1.1 Introduction

1.1.1 This section provides background and further information relating to the methodology applied in the Landscape and Visual Impact Assessment (LVIA), as reported in **Chapter 7, Landscape and visual effects** of the Environmental Statement [TR010044/APP/6.1].

1.2 Assessment methodology

Assessment guidance

1.2.2 The following guidance has been used to inform the scope and content of the LVIA, and to assist the identification and mitigation of likely significant effects. This builds upon the overarching EIA methodology and guidance presented in **Chapter 4, Environmental assessment methodology** of the Environmental Statement [TR010044/APP/6.1].

Design Manual for Roads and Bridges

1.2.3 Guidance contained with the DMRB standard *LA 107 Landscape and visual effects* (Ref 1-1) has been applied in the LVIA to assist the identification of landscape and visual receptors and their sensitivity to change, and to identify and evaluate the effects that construction and operation of the Scheme would likely have on landscape as a resource, people's views and visual amenity.

1.2.4 Guidance contained within the DMRB standard *LA 104 Environmental assessment and monitoring* (Ref 1-2) has been used to guide the categorisation and significance of effects identified through the LVIA.

1.2.5 Guidance contained in the DMRB standards *GG 103 Introduction and general requirements for sustainable development and design* (Ref 1-3) and *LA 117 Landscape design* (Ref 1-4) has been used in the assessment to inform the design-development of the Scheme, guide the identification of mitigation measures, and to assist development of the overall landscape strategy illustrated on the Environmental Masterplan on **Figure 2.4** of the Environmental Statement [TR010044/APP/6.2].

Guidelines for Landscape and Visual Impact Assessment: Third edition

1.2.6 Guidance contained in the *Guidelines for Landscape and Visual Impact Assessment: Third edition* (GLVIA3) (Ref 1-5) published by the Landscape Institute and the Institute of Environmental Management and Assessment has been used in the assessment to supplement the advice and best practice contained in *LA 107* (Ref 1-1). *GLVIA3* is specifically referred to on page 76 of the *National Policy Statement for National Networks* (Ref 1-6).

An Approach to Landscape Character Assessment

1.2.7 Advice contained within the Natural England publication *An Approach to Landscape Character* (Ref 1-7) was used to supplement the guidance and approaches to undertaking landscape character assessment contained in *LA 107* (Ref 1-1) and *GLVIA3* (Ref 1-5).

Townscape Character Assessment Technical Information Note 05/17

1.2.8 Information contained in the Landscape Institute's *Townscape Character Assessment Technical Information Note 05/17* (Ref 1-8) was used to assist the identification and assessment of impacts and effects on areas of townscape¹.

Infrastructure Technical Guidance Note 04/20

1.2.9 The landscape strategy was further supported by guidance set out in the Landscape Institute's *Infrastructure Technical Guidance Note 04/20* (Ref 1-9).

Visual Representation of Development Proposals, Technical Guidance Note 06/19

1.2.10 Information contained in the Landscape Institute's *Visual Representation of Development Proposals, Technical Guidance Note 06/19* (Ref 1-10) was used to aid the selection and preparation of visualisations for the Scheme to support the LVIA.

Establishment of the baseline

Consultation

1.2.11 Information and opinions concerning the Scheme were obtained from the following organisations:

- a. Natural England.
- b. Cambridgeshire County Council.
- c. Bedford Borough Council.
- d. Central Bedfordshire Council.
- e. Huntingdonshire District Council.
- f. South Cambridgeshire District Council.

1.2.12 A meeting was held with landscape officers representing Bedford Borough Council, Central Bedfordshire Council, Huntingdonshire District Council and South Cambridgeshire District Council on 3 July 2018. At this meeting the methodology, study area and the landscape and visual receptors upon which the LVIA was to be based were discussed. These matters were subsequently agreed in writing.

1.2.13 Further details regarding consultation undertaken as part of the Scheme are presented in the Consultation Report **[TR010044/APP/5.1]**.

¹ Townscape comprises the landscape within built-up areas and includes buildings, urban open spaces, green spaces and their inter-relationships.

Desk study

- 1.2.14 The following sources of data were reviewed to inform the landscape baseline.
- a. *Bedford Borough Landscape Character Assessment*, 2014 (Ref 1-11).
 - b. *Cambridgeshire Landscape Guidelines*, 1991 (Ref 1-12).
 - c. *Cambridgeshire Green Infrastructure Strategy*, 2011 (Ref 1-13).
 - d. *Central Bedfordshire Landscape Character Assessment*, 2015 (Ref 1-14).
 - e. *Huntingdonshire Landscape and Townscape Assessment Supplementary Planning Document (SPD)*, 2007 (Ref 1-15).
 - f. *Bedford Borough Landscape Character Assessment, 2007* (Ref 1-16).
- 1.2.15 Reference was also made to the prevailing policy framework including local plans to identify any designated landscapes or features of value and their relationship to the Scheme. Further details regarding local policy are presented in **Appendix 7.1** of the Environmental Statement [TR010044/APP/6.1].
- 1.2.16 Other information sources referenced as part of the baseline review included 1:25,000 and 1:10,000 scale Ordnance Survey mapping, 3-dimensional topographical data, and site photographs and aerial photography.

Fieldwork surveys

- 1.2.17 Fieldwork surveys were undertaken by qualified and experienced landscape architects in late winter, spring and summer 2018 to inform the scoping process and record the winter and summer season conditions, with further surveys carried out in winter 2018, summer and autumn 2019 and spring 2020 to record seasonal conditions and changes in the baseline conditions.
- 1.2.18 The purpose of this fieldwork was to review the boundaries and key characteristics defined in the published landscape character assessments and to identify, record and map the following aspects and characteristics of the landscape:
- a. Landcover, pattern and texture.
 - b. Scale and appearance.
 - c. Tranquillity.
 - d. Cultural associations.
 - e. Human interaction.
- 1.2.19 Attributes recorded as part of the fieldwork surveys included features and elements associated with the built environment and historic landscape and areas of managed landscape. Perceptual qualities of the landscape, such as background noise and tranquillity were also recorded.
- 1.2.20 Fieldwork surveys were also used to identify visual receptors and representative viewpoints and to clarify the extent of views, taking account of the effect of intervening features such as buildings and vegetation.

1.2.21 Arboricultural surveys were undertaken in February 2018, July to August 2018, October 2019 and April 2020 by suitably qualified and experienced arboriculturists, to identify and map the location, age, species and health of all trees within the Scheme's Order limits. The findings of the arboricultural survey is presented in **Appendix 7.5** of the Environmental Statement **[TR010044/APP/6.3]**.

1.2.22 An extended Phase 1 Habitat Survey, Phase 2 Habitat / National Vegetation Classification surveys, arable flora survey, and veteran tree and hedgerow survey have also been carried out as part of the Biodiversity assessment reported in **Chapter 8, Biodiversity** of the Environmental Statement **[TR010044/APP/6.1]**. Information from these surveys has been used, where relevant, to inform the identification of baseline landscape conditions.

Landscape baseline

1.2.23 Landscape is defined in *LA 107* as “An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.” (Ref 1-1).

1.2.24 Landscape receptors are referred to in *LA 107* as a “defined aspect of the landscape resource that potentially could be affected by the project” (Ref 1-1). They have been identified via a review of published landscape character assessments, maps and aerial photography, relevant planning policy and fieldwork surveys.

1.2.25 Landscape character is defined in *LA 107* as “a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse” (Ref 1-1). Landscape Character Types (LCT) and Landscape Character Areas (LCA) have been identified with reference to published landscape character assessments at the national, regional and district level.

1.2.26 The geographical extent of LCAs in published assessments are generally large and extend beyond the study area. To enable a more detailed assessment of the existing landscape character at a scale more relevant to the Scheme, 16 Local Landscape Character Areas (LLCA) were identified via desk study and fieldwork surveys in line with Natural England's *An Approach to Landscape Character Assessment* (Ref 1-7). These LLCA have formed the basis of the assessment of landscape effects and have informed the development of the landscape design. They are generally sub-divisions of existing LCAs identified in published landscape character assessments.

Tranquillity

1.2.27 Tranquillity is a perceptual aspect of landscape. *GLVIA3* (Ref 1-5) defines tranquillity as “a state of calm and quietude associated with peace, considered to be a significant asset of landscape”.

1.2.28 **Figure 7.6** of the Environmental Statement [TR010044/APP/6.2] illustrates the relative tranquillity across the study area, as mapped by the Campaign to Protect Rural England (CPRE) (Ref 1-17). The map is based on a spectrum of more or less tranquil areas, such that the scores illustrated are relative and do not identify absolute tranquillity. The following factors have been considered in describing the baseline tranquillity for each LLCA.

1.2.29 CPRE identify positive factors which contribute to tranquillity as:

- a. Openness of the landscape (freedom from development).
- b. Perceived naturalness of the landscape.
- c. Rivers in the landscape.
- d. Areas of low noise.
- e. Visibility of the sea.

1.2.30 CPRE lists negative factors as:

- a. Presence of other people.
- b. Visibility of roads.
- c. General signs of overt human impact.
- d. Visibility of urban development.
- e. Road, train and urban area noise;
- f. Night time light pollution.
- g. Aircraft noise.
- h. Military training noise.

Visual baseline

1.2.31 Establishing the visual baseline involved the identification of visual receptors within the study area. i defines visual receptors as “*individuals and/or defined groups of people who potentially could be affected by a project*” (Ref 1-1). This includes residents, users of public rights of way (PRoW) and motorists.

1.2.32 A series of zones of theoretical visibility (ZTVs) were first prepared for the whole Scheme and the principal junctions, the purpose of which was to:

- a. Identify the theoretical extents of Scheme visibility i.e. the locations from which the Scheme and its associated traffic could potentially appear in existing views.
- b. Assist in the identification of the study area.
- c. Identify visual receptors likely to be affected by the Scheme.
- d. Identify locations that are representative of the views experienced by visual receptors at different locations within the study (representative viewpoints).
- e. Inform the design, including the siting of proposed mitigation

- 1.2.33 *LA 107* (Ref 1-1) defines a ZTV as a “map produced (usually digitally) to specific criteria to illustrate the area(s) from which a project can theoretically be visible”.
- 1.2.34 The following computer-generated ZTVs have been prepared to inform the LVIA:
- a. Figure 7.14.1 - Zone of Theoretical Visibility (ZTV) – Operation: whole Scheme operation, bare earth.
 - b. Figure 7.14.2 - Zone of Theoretical Visibility (ZTV) – Operation: whole Scheme, screened.
 - c. Figure 7.14.3 - Zone of Theoretical Visibility (ZTV) – Operation: Black Cat junction, bare earth.
 - d. Figure 7.14.4 - Zone of Theoretical Visibility (ZTV) – Operation: Black Cat junction, screened.
 - e. Figure 7.14.5 - Zone of Theoretical Visibility (ZTV) – Operation: Cambridge Road junction, bare earth.
 - f. Figure 7.14.6 - Zone of Theoretical Visibility (ZTV) – Operation: Cambridge Road junction, screened.
 - g. Figure 7.14.7 - Zone of Theoretical Visibility (ZTV) – Operation: Caxton Gibbet junction, bare earth.
 - h. Figure 7.14.8 - Zone of Theoretical Visibility (ZTV) – Operation: Caxton Gibbet junction, screened.
- 1.2.35 All ZTVs have been prepared under the guidance of a competent expert with an understanding of the requirements in undertaking these and a detailed knowledge of the Scheme. They have been modelled using the ‘Viewshed’ tool in ESRI ArcMap GIS Software and are based on a 5 metre resolution Digital Terrain Model (DTM).
- 1.2.36 For all ZTVs an assumed viewing height of 1.6 metres above ground level has been used to simulate the eye level of a person of average height.
- 1.2.37 “Bare earth” ZTVs were created using GIS software to analyse a 3-dimensional digital model of the Scheme, overlaid onto a digital terrain model (DTM) based on the Ordnance Survey (OS) Terrain 5 dataset. These ZTVs represent a worst-case scenario as they do not include features such as existing buildings or vegetation which can screen or filter views.
- 1.2.38 “Screened” ZTVs were also prepared which included 3-dimensional data from OS MasterMap to represent existing buildings (of an assumed height of 7.5 metres AGL) and wooded areas (of an assumed height of 12.5 metres AGL). This data represents the degree of potential screening or filtering of views of the Scheme.

- 1.2.39 The ZTVs are based on the extent of built infrastructure within the Order Limits. These have been constructed based on a sequence of points along the line marking the highest point of the new dual carriageway and side roads (to account for carriageway camber) at 10 metre intervals. The height of the carriageway was further increased by 1 metre to account for the vertical limits of deviation and by an additional 4 metres to account for the height of high-sided vehicles.
- 1.2.40 Where elements of the Scheme such as variable message signs would be located at existing ground levels, their potential visibility was established via fieldwork surveys rather than through the ZTV process.
- 1.2.41 The ZTVs and fieldwork have been used to inform the extent of the study area, as described in Section 1.3, and the definition of the visual baseline and assessment of visual effects.
- Visual receptors and representative viewpoints*
- 1.2.42 Visual receptors likely to experience views of the construction or operation of the Scheme were identified through interrogation of the ZTVs and fieldwork surveys, and subsequently categorised into the following types:
- Residents.
 - Commercial.
 - Users of public rights of way.
 - People traveling through the area on roads and trains.
- 1.2.43 Where a collection of visual receptors in the same category were likely to experience similar views, these were grouped.
- 1.2.44 Representative viewpoints were identified to assist in describing the baseline view and the effects likely to be experienced by visual receptors, the locations of which were agreed with the relevant local authorities.
- 1.2.45 The selection of representative viewpoints was informed by the criteria set out in paragraph 3.34.1 of LA 107 (Ref 1-1), as follows:
- Accessibility to the public.
 - Number and sensitivity of viewers who can be affected.
 - Viewing direction, distance (i.e. short, medium or long-distance views) and elevation.
 - Nature of the viewing experience.
 - View type.
 - Cumulative views in conjunction with other development projects.
- 1.2.46 A total of 53 representative viewpoints were identified within the ZTV extents. These representative viewpoints have been selected on the basis that they cover a range of viewing distances, elevations and orientations from locations with different viewing experiences of the Scheme.

- 1.2.47 Eighteen of these viewpoints were selected to be used for photomontage to illustrate how the Scheme would likely appear in existing views from these locations.
- 1.2.48 The locations of these 18 representative viewpoints for photomontage were initially proposed within the scoping report (Ref 1-18) and were previously agreed with the relevant local authorities. They also take into account requests made by local authority landscape officers for the inclusion of additional representative viewpoints to the north east of St Neots.
- 1.2.49 The final list of the viewpoints and visual receptors evaluated in the visual assessment was re-numbered from west to east and is presented in the Visual Effects Schedule (VES) presented in **Appendix 7.4** of the Environmental Statement [TR010044/APP/6.3] and on the Visual Effects Drawings (VED) presented on **Figure 7.11 – Figure 7.13** of the Environmental Statement [TR010044/APP/6.2].
- 1.2.50 Photographs and visualisations have been prepared to either help demonstrate the nature of baseline views and the extent of the Scheme, or to illustrate a particular matter such as the effectiveness of the planting strategy.
- 1.2.51 These photographs and visualisations have been prepared in accordance with best practice guidance published by the Landscape Institute (Ref 1-10) and are presented as Type 1² (annotated viewpoint photographs) or Type 4³ (photomontage) on **Figure 7.15.1** to **Figure 7.15.53** of the Environmental Statement [TR010044/APP/6.2].

Sensitivity of receptors

Landscape sensitivity

- 1.2.52 Paragraph 3.18 of *LA 107* (Ref 1-1) states that the “assessment of the sensitivity of landscape receptors shall report on a combined judgement of:
- a. *the susceptibility of the receptor to the proposed change from the baseline situation; and*
 - b. *the value attached to that receptor.”*
- Landscape value
- 1.2.53 The value of landscape receptors has been defined as part of the establishment of the baseline conditions.
- 1.2.54 Paragraph 3.13 of *LA 107* (Ref 1-1) states that “baseline studies, appropriate and proportionate to the context of the project, shall establish the relative value of the areas of landscape to be affected, either as a whole or individual components that contribute to its character.”

² Type 1 visualisations are the most basic form of visual representation and are produced to aid the clear understanding of a view and context, typically by illustrating the extent of a development site within the view and annotating any key features.

³ Type 4 visualisations represent the most sophisticated type of visualisation and require the use of equipment and processes which provide quantifiable data, the accuracy of which can be checked and verified.

- 1.2.55 LA 107 (Ref 1-1) acknowledges that a landscape does not need to be designated to have a value. Note 1 under Paragraph 3.22 states that “*Whilst designated areas are highly valued, the majority of land is comprised of non-designated areas which can still be of high quality and/or of great local importance.*”
- 1.2.56 Consideration has been given to the geographic scale at which landscape resources are valued, with reference to the following criteria:
- a. **National** – Landscape with elements of national importance, for example those protected by legislation.
 - b. **Regional** – Landscape with elements of regional importance, for example designated regional leisure routes and conservation areas.
 - c. **Local** – Landscape with elements which are protected or valued through local or neighbourhood planning policies, for example protected open spaces, groups of listed buildings or buildings of townscape merit.
 - d. **Community** – Landscape with relatively common elements which are likely to be valued by communities that live and work in the area.
 - e. **Limited** – Landscape with weak or discordant elements and characteristics which detract from the quality of the area.
- 1.2.57 The value of landscape receptors has then been classified with reference to the criteria set out in **Table 1-1**.

Table 1-1: Landscape value criteria

Classification	Description
 Very high	The landscape is likely to be valued for one or more of its attributes at a national or regional level, and may be protected by a statutory landscape designation, e.g. National Park or Area of Outstanding Natural Beauty (AONB). The landscape may contain elements/features which are rare or perceived as very representative of the national or regional attributes and cultural associations. The landscape may provide a high scenic and landscape quality as well as many recreational opportunities.
	The landscape is likely to be valued for one or more of its attributes at a community or local level and may be designated by a landscape policy designation, e.g. Special Landscape Area.
Medium 	The landscape may contain elements/features which are representative of the community or local level attributes and cultural associations. The landscape may provide some scenic and landscape quality and some recreational opportunities.
	The landscape is likely to be valued at a limited level only and not covered by any landscape designations. The landscape may contain features which are common and therefore do not specifically contribute to the wider landscape or cultural association.

Classification	Description
Negligible	The landscape may provide a limited scenic and landscape quality and few recreational opportunities.

Susceptibility to change of landscape receptors

- 1.2.58 Paragraph 3.4.1 of *LA 107* (Ref 1-1) states that “*the assessment of susceptibility to change should be tailored to the project*”.
- 1.2.59 Susceptibility to change is defined in *GLVIA3* (Ref 1-5) as “*the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and/or features, or a particular aesthetic and perceptual aspect) to accommodate the Scheme without undue consequences for the maintenance of the baseline situation*”.
- 1.2.60 Judgements regarding the susceptibility of landscape receptors to change have been informed by the criteria set out in **Table 1-2** below.

Table 1-2: Susceptibility to change of landscape receptors

Classification	Description
 <p>Very high</p> <p>Medium</p> <p>Negligible</p>	The receptor has a low capacity to accommodate the proposed development without effects upon its overall integrity. The landscape is likely to have a strong pattern/texture or is a simple but distinctive landscape and/or with high value features and essentially intact. Undue consequences are likely to arise from the Scheme.
	The receptor has some capacity to accommodate the proposed development without effects upon its overall integrity. The pattern of the landscape is mostly intact and/or with a degree of complexity and with features mostly in reasonable condition. Undue consequences may arise from the Scheme.
	The receptor is robust; it can accommodate the proposed development without effects upon its overall integrity. The landscape is likely to be simple, monotonous and/or partially degraded with common/indistinct features and minimal variation in landscape pattern. Undue consequences are unlikely to arise from the Scheme.

Combining judgements to determine sensitivity of landscape receptors

- 1.2.61 The value attached to landscape receptors and their susceptibility to change has been considered separately, and then combined to determine sensitivity in line with Figure 3.17N of *LA 107* (Ref 1-1).
- 1.2.62 The sensitivity of landscape receptors has been reported in accordance with the criteria provided in Table 3.22 of *LA 107* (Ref 1-1), which are reproduced in **Table 1-3** below.

Table 1-3: Landscape sensitivity

Classification	Description
Very high	Landscapes of very high international/national importance and rarity or value with no or very limited ability to accommodate change without substantial loss/gain (i.e. national parks, internationally acclaimed landscapes - UNESCO World Heritage Sites).
High	Landscapes of high national importance containing distinctive features/elements with limited ability to accommodate change without incurring substantial loss/gain (i.e. designated areas, areas of strong sense of place - registered parks and gardens, country parks).
Medium	Landscapes of local or regional recognition of importance able to accommodate some change (i.e. features worthy of conservation, some sense of place or value through use/perception).
Low	Local landscape areas or receptors of low to medium importance with ability to accommodate change (i.e. non-designated or designated areas of local recognition or areas of little sense of place).
Negligible	Landscapes of very low importance and rarity able to accommodate change.

Sensitivity of visual receptors

1.2.63 The note under Paragraph 3.39 of LA 107 (Ref 1-1) states that “determining the susceptibility of different visual receptors to change and the value attached to particular views identified within the ZTV, is of particular importance to the assessment process.”

Value of views

1.2.64 The classification of the value of views has been informed by the location of the viewing place and the quality or designation of the existing elements in the view, as presented in **Table 1-4**.

Table 1-4: Value of views

Classification	Description
National	Recognised or iconic views within nationally/internationally designated landscapes, such as National Parks, AONB and/or national/international landmarks with views recognised in planning policy and/or management plans
Regional	Views or viewing places identified in the East of England landscape framework or regional strategies
Local	Views across high quality landscape which might include features of interest, such as landmarks, which may be identified in the Local Plan

Classification	Description
Community	Views of relatively common landscape elements, likely to be valued by the communities which experience the view
Limited	Views across poor quality landscape with a high degree of detracting or common elements

Susceptibility to change of visual receptors

- 1.2.65 Visual sensitivity is also dependent upon the susceptibility of different receptors to changes in views and the visual amenity they experience at particular locations.
- 1.2.66 Susceptibility is defined in *LA 107* (Ref 1-1) as the “*ability of a defined visual receptor to accommodate the specific proposed change without negative consequences.*”
- 1.2.67 Page 113, paragraph 6.32 of *GLVIA3* (Ref 1-5) adds that “*The susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:*
- a. *the occupation or activity of people experiencing the view at particular locations; and*
 - b. *The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.*”
- 1.2.68 Paragraph 6.33 of *GLVIA3* states that visual receptors most susceptible to change are generally likely to include residents at home. Paragraph 6.36 goes on to state that this includes residents “*especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area.*”
- 1.2.69 As susceptibility is defined as the ability of the receptor to accommodate changes arising from the specific proposal, consideration of the contribution of existing major infrastructure in baseline views has also been made in drawing conclusions.
- 1.2.70 The susceptibility of visual receptors to the changes likely to result from the Scheme has been assessed with reference the criteria set out in **Table 1-5**.

Table 1-5: Susceptibility to change of visual receptors

Visual receptor	Susceptibility to change		
	Very high	← Medium →	Negligible
Occupation or activity	People living in the area or visiting areas because of their high landscape value	People passing through the area on designated routes	People working inside or passing through the area on public roads or railway lines
Degree of attention on the view	Views are an important part of the experience of the landscape	Views are relevant to the experience or activity but not central to it	Views are likely to be focused on the activity of the receptor, rather than the view
Degree of exposure to the view	Views are likely to be open	Views may be framed, partially screened or filtered	Views are likely to be limited to glimpses or are heavily screened
Length of exposure to the view	Views are likely to be experienced daily or for long periods of time	Views may be fleeting or experienced as a sequence of views moving through the area	Views are likely to be short
Extent of existing major infrastructure in baseline views	Views with no or few infrastructure elements	Views include existing infrastructure elements	Views include extensive existing infrastructure elements

Combining judgements to determine sensitivity of visual receptors

- 1.2.71 The note at the top of page 30 of LA 107 states that the process of determining sensitivity is to “*judge susceptibility of the receptor to change and value of the views separately, combining them together to arrive at the sensitivity of the visual receptor or visual sensitivity.*”
- 1.2.72 The sensitivity of visual receptors is based on professional judgement and has been informed by the criteria set out in Table 3.41 of LA 107 (Ref 1-1), which are reproduced in **Table 1-6**.

Table 1-6: Criteria for visual sensitivity

Sensitivity criteria	Typical description
Very high	1) Static views from and of major tourist attractions; 2) Views from and of very important national/international landscapes, cultural/historical sites (e.g. National Parks, UNESCO World Heritage sites); 3) Receptors engaged in specific activities for enjoyment of dark skies.

Sensitivity criteria	Typical description
High	1) Views by users of nationally important PRoW / recreational trails (e.g. national trails, long distance footpaths); 2) Views by users of public open spaces for enjoyment of the countryside (e.g. country parks); 3) Static views from dense residential areas, longer transient views from designated public open space, recreational areas; 4) Views from and of rare designated landscapes of national importance.
Medium	1) Static views from less populated residential areas, schools and other institutional buildings and their outdoor areas; 2) Views by outdoor workers; 3) Transient views from local/regional areas such as public open space, scenic roads, railways or waterways, users of local/regional designated tourist routes of moderate importance; 4) Views from and of landscapes of regional importance.
Low	1) Views by users of main roads or passengers in public transport on main arterial routes; 2) Views by indoor workers; 3) Views by users of recreational/formal sports facilities where the landscape is secondary to enjoyment of the sport; 4) Views by users of local public open spaces of limited importance with limited variety or distinctiveness.
Negligible	1) Quick transient views such as from fast moving vehicles; 1) Views from industrial area, land awaiting re-development; 2) Views from landscapes of no importance with no variety or distinctiveness.

Assessment of effects

1.2.73 The identification of landscape and visual effects takes account of the effectiveness of embedded and essential mitigation measures contained in **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1].

Magnitude of landscape effects

1.2.74 The magnitude of landscape effects has been determined in consideration of the of size/scale, geographical extent of influence and its duration and reversibility.

1.2.75 The criteria contained within LA 107 (Ref 1-1) and reproduced in **Table 1-7** have been adopted in the assessment to identify the magnitude of landscape effect (adverse or beneficial) that the Scheme is likely to have on landscape character and its component features and elements.

Table 1-7: Magnitude and nature of effect on the landscape

Magnitude of effect (change)		Description
Major	Adverse	Total loss or large-scale damage to existing landscape character or distinctive features or elements; and/or addition of new uncharacteristic, conspicuous features or elements (i.e. road infrastructure).
	Beneficial	Large scale improvement of landscape character to features and elements and/or addition of new distinctive features or elements, or removal of conspicuous road infrastructure elements.
Moderate	Adverse	Partial loss or noticeable damage to existing landscape character or distinctive features or elements; and/or addition of new uncharacteristic, noticeable features or elements (i.e. road infrastructure).
	Beneficial	Partial or noticeable improvement of landscape character by restoration of existing features or elements; or addition of new characteristic features or elements or removal of noticeable features or elements.
Minor	Adverse	Slight loss or damage to existing landscape character of one (maybe more) key features and elements; and/or addition of new uncharacteristic features and elements.
	Beneficial	Slight improvement of landscape character by the restoration of one (maybe more) key existing features and elements; and/or the addition of new characteristic features.
Negligible	Adverse	Very minor loss, damage or alteration to existing landscape character of one or more features and elements.
	Beneficial	Very minor noticeable improvement of character by the restoration of one or more existing features and elements.
No change		No noticeable alteration or improvement, temporary or permanent, of landscape character of existing features and elements.

Magnitude of visual effects

- 1.2.76 The magnitude of visual effects has been informed by the key points of consideration set out in paragraph 3.42 of LA 107 (Ref 1-1), which comprise:
- a. *Scale of change*
 - b. *Nature of change*
 - c. *Duration of change*
 - d. *Distance*
 - e. *Screening*

- f. *Direction and focus of the view*
- g. *Year 1 (opening year) and year 15 (design year) including summer and winter;*
- h. *Removal of past mitigation or existing vegetation*
- i. *Whether the receptor is static or moving.*

1.2.77 The magnitude of visual effects has also considered the extent of the view influenced, the elements of the Scheme that would be visible, the level of integration with existing elements and the reversibility of effects.

1.2.78 The criteria contained within *LA 107* (Ref 1-1) and reproduced in **Table 1-8** have been adopted in the assessment to identify the magnitude of visual effect (adverse or beneficial) that the Scheme is likely to have on visual receptors.

Table 1-8: Magnitude of visual effect

Magnitude of visual effect (adverse or beneficial)	Description
Major	The project, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the project work or activity would be discernible, or being at such a distance it would form a barely noticeable feature or element of the view.
No change	No part of the project work or activity would be discernible.

Assessment of night time lighting effects

1.2.79 A qualitative assessment of night time lighting effects has been carried out for landscape and views.

1.2.80 The night time baseline has been described with reference to *England’s Light Pollution and Dark Skies* map (Ref 1-19) published by the Campaign to Protect Rural England (CPRE); the applicable section is reproduced on **Figure 7.7** of the Environmental Statement [TR010044/APP/6.2]. These maps are based on data gathered by a weather satellite. The data is split into nine categories (see **Table 1-9**) to distinguish between different light levels and the maps are divided into pixels, 400 metres x 400 metres, to show the amount of light shining up into the night sky from that area measured in nanowatts.

Table 1-9: Significance categories and descriptions

Categories	Brightness values in nanowatts/cm2/steradian (nw/cm2/sr)
Colour band 1 (darkest)	<0.25
Colour band 2	0.25 – 0.5
Colour band 3	0.5 - 1
Colour band 4	1 - 2
Colour band 5	2 - 4
Colour band 6	4 - 8
Colour band 7	8 - 16
Colour band 8	16 - 32
Colour band 9	>32

Significance of landscape and visual effects

- 1.2.81 The identification of the likely significant effects on landscape and visual receptors has relied on reasoned argument, the professional judgement of competent experts, and consultation with stakeholders. It has also been informed by knowledge and experience gathered from assessments of similar highway schemes.
- 1.2.82 The approach to determining the significance of landscape and visual effects has been guided by the significance categories and typical descriptions set out in Table 3.7 of *LA 104* (Ref 1-2), as set out in **Table 1-10**.

Table 1-10: Significance categories and descriptions

Significance category	Description
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process

Significance category	Description
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

1.2.83 In line with *GLVIA3* (Ref 1-5), the conclusions on the significance of effect on landscape and visual receptors has been supported by a narrative which justifies the reason for the level assigned.

1.2.84 The approach to deriving the significance of landscape and visual effects from the sensitivity of receptor values and the magnitude of effects has been informed by Table 3.8.1 of *LA 104* (Ref 1-2), as shown in **Table 1-11**.

Table 1-11: Significance Matrix

		Magnitude of effect				
		No effect	Negligible	Minor	Moderate	Major
Sensitivity	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Moderate	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

1.2.85 *GLVIA3* (Ref 1-5) acknowledges that the assessment of significance is not a prescriptive process. Where the significance of an effect is represented by two descriptors, for example large/very large within the matrix, professional judgement has been used to determine which of the significance descriptors applies to the effect being assessed.

1.2.86 Where professional judgement has resulted in a deviation from the thresholds presented in the matrix, these are explained within the relevant sections of **Chapter 7, Landscape and visual effects** of the Environmental Statement **[TR010044/APP/6.1]** and are supported by appropriate evidence and explanation.

1.2.87 Significant effects comprise those effect that are within the moderate, large or very large categories, in accordance with *LA 104* (Ref 1-2).

Future baseline

- 1.2.88 The assessment has considered the future changes connected with developments where construction has commenced but is not yet complete, and those connected with developments that have planning consent and would influence the landscape and visual baseline in both the construction year(s) and the year of opening.

1.3 Establishing the study area

- 1.3.1 Paragraph 3.11 of LA 107 (Ref 1-1) states that *“the study area shall be identified on a project by project basis and be proportionate to the following factors:*
- 1) *the project boundary/construction activity (including compounds and temporary land take);*
 - 2) *the wider landscape setting within which the project/its works has the potential to influence;*
 - 3) *the extent of the area visible by the project; and*
 - 4) *the full extent of adjacent or affected landscape receptors of special value (i.e. conservation areas, designated areas) whose setting can be influenced by the project.”*
- 1.3.2 The process for determining the extent of the study area began with a desk-based review to identify an area of search during the scoping exercise. This involved the preparation of a preliminary, computer generated, bare earth ZTV to initially identify the areas from within which the operational Scheme may theoretically be visible.
- 1.3.3 Since undertaking the scoping exercise, further work was undertaken to refine the study area for the LVIA based on the following factors:
- a. Landscape, heritage and habitat designations (where these contribute to the value of landscape receptors).
 - b. LCAs identified in published landscape character assessments.
 - c. The extents of the ZTVs based on the preliminary design of the Scheme;
 - d. Fieldwork survey observations including the influence of existing landform, vegetation and settlement including: Cambourne; Papworth Everard; Eltisley; Croxton; Yelling; Toseland; Little Barford; St Neots; Wyboston; Chawston; Roxton; and Tempsford.
 - e. Elements of construction likely to be most visible, comprising construction compounds and plan, such as cranes, haul routes, borrow pits and materials storage.
 - f. The scale and massing of the infrastructure associated with the Scheme.
 - g. The operational elements of the Scheme, including gantries, signage, bridges and the movement of traffic.

- 1.3.4 Other information sources referenced during the refinement of the study area included 1:25,000, 1:10,000 and 1:1,250 scale Ordnance Survey mapping, 3D topographical data and aerial photography.
- 1.3.5 A review of these factors indicated that the visibility of the Scheme could extend to 5 kilometres (3.1 miles) beyond the Order limits in more isolated, elevated locations, for example Greensand Ridge to the south east of the existing Black Cat roundabout, but that the visibility and perception of the Scheme would generally be confined to a distance of 2 kilometres (1.2 miles).
- 1.3.6 The study area for the LVIA includes all land within the Order Limits and the area within which the Scheme may give rise to significant landscape and visual effects, as illustrated in **Figure 7.1** of the Environmental Statement [TR010044/APP/6.2].

1.4 References

- Ref 1-1 LA 107 Landscape and visual effects (Revision 2). Highways England (2020). <https://www.standardsforhighways.co.uk/dmrb/search/bc8a371f-2443-4761-af5d-f37d632c5734>
- Ref 1-2 LA 104 Environmental assessment and monitoring (Revision 1). Highways England (2020). <https://www.standardsforhighways.co.uk/dmrb/search/0f6e0b6a-d08e-4673-8691-cab564d4a60a>
- Ref 1-3 GG 103 Introduction and general requirements for sustainable development and design. Highways England (2019). <https://www.standardsforhighways.co.uk/dmrb/search/89d10ef2-7833-44df-9140-df85cd6382b9>
- Ref 1-4 LD 117 Landscape Design (Revision 0). Highways England (2020). <https://www.standardsforhighways.co.uk/dmrb/search/82073bde-ec0c-4d4f-8eeb-afe0ace3c639>
- Ref 1-5 Guidelines for Landscape and Visual Impact Assessment 3rd Edition. Landscape Institute and the Institute of Environmental Management and Assessment (2013).
- Ref 1-6 National Policy Statement for National Networks. Department for Transport (2014). <https://www.gov.uk/government/publications/waste-management-plan-for-england>
- Ref 1-7 An Approach to Landscape Character Assessment. Natural England (2014). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/691184/landscape-character-assessment.pdf
- Ref 1-8 Townscape Character Assessment – Technical Information Note 05/17. Landscape Institute (2018). <https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2018/04/tin-05-2017-townscape.pdf>

- Ref 1-9 Infrastructure Technical Guidance Note 04/20. Landscape Institute (2020).
<https://www.landscapeinstitute.org/technical-resource/infrastructure-guidance/>
- Ref 1-10 Visual Representation of Development Proposals – Technical Guidance Note 06/19. Landscape Institute (2019).
https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf
- Ref 1-11 Bedford Borough Landscape Character Assessment. Bedford Borough Council (2014).
<http://www.forms.bedford.gov.uk/planning/BBCLCAFinal2014-11-28.pdf>
- Ref 1-12 Cambridgeshire Landscape Guidelines – A Manual for Management and Change in the Rural Landscape. Cambridgeshire County Council. (1991).
https://www.cambridgeshire.gov.uk/asset-library/imported-assets/Landscape_document.pdf
- Ref 1-13 Cambridgeshire Green Infrastructure Strategy. Cambridgeshire County Council (2011).
<https://www.cambridge.gov.uk/media/2557/green-infrastructure-strategy.pdf>
- Ref 1-14 Central Bedfordshire Landscape Character Assessment. Central Bedfordshire Council (2015).
https://www.centralbedfordshire.gov.uk/info/44/planning/446/landscape_character_assessment/2
- Ref 1-15 Huntingdonshire Landscape and Townscape Assessment. Huntingdonshire District Council (2007).
<https://www.huntingdonshire.gov.uk/media/1240/landscape-guide.pdf>
- Ref 1-16 Bedford Borough Landscape Character Assessment. Bedford Borough Council (2007).
- Ref 1-17 Tranquility Map: England. Campaign to Protect Rural England (2007).
<https://www.cpre.org.uk/resources/tranquility-map-england/>
- Ref 1-18 A428 Black Cat to Caxton Gibbet: Environmental Scoping Report. Highways England (2019).
<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010044/TR010044-000006-BCCG%20-%20Scoping%20Report.pdf>
- Ref 1-19 England's light pollution and dark skies. Campaign to Protect Rural England (2016).
<https://www.nightblight.cpre.org.uk/maps/>