

## 18 Cumulative effects and impact interactions

### Executive summary

This chapter presents the results of an assessment of cumulative impacts and impact interactions of the scheme in combination with other reasonably foreseeable developments in the area. The most significant such effects identified include:

- loss of best and most versatile agricultural land;
- urbanisation of the landscape character through the interaction of noise, lighting and visual intrusion from new infrastructure; and
- improved provision of routes for active modes of travel (walking and cycling).

Interactive impacts of the scheme would be most evident in the Mill Common and Views Common areas of Huntingdon where there would be temporary disruption and inconvenience to pedestrians and cyclists during construction, and the introduction of new roads to be crossed by pedestrians and cyclists. However, taking into account the likely improvements to air quality, noise, townscape and cultural heritage there is predicted to be an overall beneficial effect on sense of place.

At the western and southern edge of Brampton, residual adverse effects for noise and landscape would be experienced, as well as disruption during construction.

Various impacts of the scheme in relation to air quality, noise, facilitation of active travel, access to open space and community cohesion would interact to benefit human health and wellbeing. Further detail is provided in *Appendix 18.1* which presents an assessment of impacts on human health.

No mitigation over and above that already put forward for the scheme has been found necessary to further mitigate adverse cumulative effects.

### 18.1 Introduction

18.1.1 This chapter provides an assessment of impacts that would affect environmental receptors and resources from different aspects of the scheme or in combination with other development projects. Such impacts can be characterised as either incrementally additive or synergistic in nature.

18.1.2 Additive impacts are referred to in this chapter as cumulative impacts, whilst synergistic impacts are referred to as impact interactions. These are defined as follows:

- Cumulative impacts: *“Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.”*

- Impact interactions: *“The reactions between impacts whether between the impacts of just one project or between the impacts of other projects in the area.”*

(Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions, European Commission, 1999).

- 18.1.3 An individual impact from a project may not be significant on its own but when combined with other impacts, could result in a significant effect.
- 18.1.4 Some of the assessments within this *Environmental Statement (ES)* already take account of cumulative impacts. The assessments for air quality (*Chapter 8*), noise (*Chapter 14*), driver stress (*Chapter 15*) and water quality (*Chapter 17*) are underpinned by the traffic model, which takes account of the likely traffic generated by future development, as agreed with local authority representatives (refer to *Chapter 7*).
- 18.1.5 This chapter therefore focuses on non-traffic related cumulative impacts. It takes account of cumulative impacts and impact interactions from the A14 Cambridge to Huntingdon improvement scheme (the scheme) itself and in combination with other past, present and “reasonably foreseeable” developments (see *Table 18.4*).
- 18.1.6 In keeping with Highways Agency guidance, reasonably foreseeable actions for the purpose of this assessment were considered to be future developments likely to take place, i.e., those with a “high degree of confidence” and those that were “likely to happen while some uncertainty remains”.

#### **Legislative and policy background**

- 18.1.7 The *Infrastructure Planning (Environmental Impact Assessment) Regulations 2009* (the “*EIA Regulations*”) require the description of likely significant effects of a development on the environment included within an environmental statement to have consideration for cumulative effects.
- 18.1.8 The draft National Policy Statement (NPS) on National Networks (December 2013) states:

*“When considering significant cumulative effects, the ES should provide information on how the effects of the applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted, as well as those already in existence)” [para. 4.12]; and*

*“The Examining Authority should consider how significant cumulative effects and the interrelationship between effects might as a whole affect the environment, even though they may be acceptable when considered on an individual basis with mitigation measures in place.” [para 4.13].*

## 18.2 Consultation

- 18.2.1 Details of consultation responses received in response to the A14 *Cambridge to Huntingdon Improvement Screening Scoping Report* are provided in the *Consultation Report*. In response to the consultation responses received, consideration of what constitutes a reasonably foreseeable development for the purposes of this assessment, has been broadened from that originally proposed in the *Scoping Report* (see paragraph 18.3.5 below for further details).
- 18.2.2 The local planning authorities (Huntingdonshire District Council, South Cambridgeshire District Council and Cambridge City Council) were consulted on 12 June 2014 for details of planning applications to be considered for the assessment. Responses were received on 13 June for Cambridge City Council and South Cambridgeshire District Council, and 23 July from Huntingdonshire District Council.

## 18.3 Method of assessment

### Guidance

- 18.3.1 The following guidance has been referred to in the assessment of cumulative effects and impact interactions presented in this chapter.
- Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions (European Commission, 1999);
  - Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5 HA205/08, (DMRB HA205/08) (Highways Agency et al., 2008);
  - Major Projects Instruction: Cumulative Assessment Requirements (MPI-04-012013) (MPI), (Highways Agency, 2012); and
  - *Advice Note 9: Rochdale Envelope*, (Planning Inspectorate, 2012a).

### Study area

- 18.3.2 The study area for the assessment extends 5km from the scheme boundary. This study area has been selected on the basis that it covers the study areas for the specialist topics in this *ES*, and is also likely to cover any overlap with the study areas for assessments undertaken for other projects.

### Identification of past and present actions

- 18.3.3 Past actions can influence how sensitive or vulnerable an environmental receptor or resource may be to any additional impacts that the scheme would bring about. Past and present actions have been considered on a topic by topic basis for the assessments presented in *Chapters 8 to 17*. In this chapter, the understanding of past and present actions has been taken from the topic based baseline descriptions as well as the description of the site and surrounding area set out in *Chapter 2*.

### Identification of reasonably foreseeable development

- 18.3.4 There is no consensus within the above identified guidance as to what constitutes 'reasonably foreseeable' development and none of the guidance is prescriptive in how 'reasonably foreseeable' should be interpreted.

- 18.3.5 In their response to the scheme scoping opinion consultation, South Cambridgeshire District Council highlighted the importance of taking account of local plan allocations in the cumulative effects assessment (as set out in *The Planning Inspectorate's Late Scoping Consultation Responses*, April 2014b). In response to these comments, the consideration of what constitutes a reasonably foreseeable development has been broadened from that proposed in the *A14 Cambridge to Huntingdon improvement Environmental Impact Assessment Scoping Report* (Highways Agency, 2014) to take account of:
- transport projects due to be implemented in a reasonable timeframe, for example as part of a planned programme of works;
  - planning applications, for which formal EIA is a requirement, that has been submitted for determination and that planning permission has either been granted or is pending a decision; and
  - major development schemes for which specific policies, development briefs, supplementary guidance or area action plans are identified and included in the relevant development plan (recognising that much information on any relevant proposals would be limited). Emerging development plans have also been considered with appropriate weight being given as they move closer to adoption.
- 18.3.6 The guidance on cumulative effects issued by the Highways Agency (2012) includes four categories of confidence in order to assist with the decision on what to include in the assessment. The four categories are “high degree of confidence”, “likely to happen while some uncertainty remains”, “significant uncertainty” and “hypothetical”. The guidance advises that developments in the first two categories should be considered as reasonably foreseeable and included in the cumulative effects assessment. This is the approach that has been adopted in the assessment, and is consistent with the inclusion in the traffic model of future development in the categories of ‘near certain’ and ‘more than likely’ (refer to *Chapter 7 of the ES*). The categorisation of future development for the purposes of traffic modelling was undertaken in agreement with representatives of Cambridge City Council, South Cambridgeshire District Council and Huntingdonshire District Council.
- 18.3.7 The traffic model also includes developments outside of the 5km study area and smaller scale developments. These are considered not to have likely significant cumulative effects in combination with the A14 improvement scheme apart from traffic-related effects, and thus are scoped out of further consideration in this chapter.
- 18.3.8 *Table 18.1* sets out the main information sources for the identification of reasonably foreseeable development used in this assessment.

**Table 18.1: Information sources for identification of reasonably foreseeable developments**

Data	Source
<b>Planning applications</b>	<p>Details of extant planning consents and planning applications currently awaiting determination, supported by an environmental statement, and within the study area provided by:</p> <ul style="list-style-type: none"> <li>• Cambridge City Council;</li> <li>• South Cambridgeshire District Council; and</li> <li>• Huntingdonshire District Council.</li> </ul>
<b>Development allocations</b>	<p>A review of relevant local development plans has been undertaken to identify any major developments that should be included in the assessment by virtue of their scale, location or timing. The following development plans were reviewed for proposed major allocated sites that have not yet been fully developed within the study area:</p> <ul style="list-style-type: none"> <li>• Adopted Cambridge Local Plan 2006;</li> <li>• Emerging Cambridge Local Plan 2014: Proposed Submission document (as submitted to the Secretary of State);</li> <li>• Adopted South Cambridgeshire Core Strategy Development Plan Document (January 2007);</li> <li>• Adopted South Cambridgeshire Development Control Policies Development Plan Document (July 2007);</li> <li>• Emerging South Cambridgeshire Local Plan 2011-2031 (as submitted for independent examination to the Secretary of State on 28 March 2014);</li> <li>• Adopted Huntingdonshire Core Strategy (September 2009); and</li> <li>• Saved policies from the Huntingdonshire Local Plan 1995 and the Local Plan Alteration 2002.</li> </ul>
<b>Transport projects</b>	<p>A review of the following plans and programmes was undertaken to identify relevant transport projects:</p> <ul style="list-style-type: none"> <li>• Cambridge Local Transport Plan 3;</li> <li>• Highways Agency Motorways and Major Trunk Roads Programme; and</li> <li>• Highways Agency Major Road Schemes Programme.</li> </ul>

### Identification of potential cumulative effects or impact interactions

18.3.9 The predicted residual effects of the scheme, identified for each topic during the EIA, were the starting point for the identification of potential cumulative effects and impact interactions. Where neutral or negligible effects have been predicted, no potential cumulative impacts or impact interactions are considered likely and therefore they were discounted from further steps in the assessment. Where residual effects were identified, consideration was then given as to whether and how these could combine with the other effects of the scheme or from other projects to give rise to cumulative effects or impact interactions. For example, whether there would be concurrent construction activity.

18.3.10 For some topics, the cumulative impacts of other developments have already been taken into account. For example, the traffic model that underpins the assessments for air quality, noise and driver stress as reported in *Chapters 8, 14 and 15* respectively, already takes into account the traffic likely to be generated by future development.

18.3.11 *Table 18.3* sets out which topics are considered likely to give rise to cumulative impacts or impact interactions, and which are not likely. This was used to set a framework to guide identification of likely cumulative effects and impact interactions in combination with other actions.

#### **Analysis of potential cumulative effects**

18.3.12 Once the potential cumulative effects of the scheme were identified, information on the other reasonably foreseeable development was then reviewed. Where these actions would also have a similar impact, this was recorded within a matrix (*Table 18.4*). Where the matrix indicated that another action would also have a similar residual impact to that of the scheme, this was analysed further, taking into account the location, characteristics and nature of these residual impacts. This analysis, which took account of the framework set out in *Table 18.3*, enabled a judgement as to whether or not cumulative effects or impact interactions were likely to be significant.

#### **Determining significance of cumulative effects and impact interactions**

18.3.13 In line with the *DMRB HA205/08* (paragraph 2.14), the consideration of significance took into account the following:

- which receptors or resources would be affected;
- how the activity or activities would affect the condition of the receptor or resource;
- the probability of such effects occurring; and
- the ability of the receptor or resource to absorb further effects before change becomes irreversible.

18.3.14 For example, those cumulative effects which would affect nationally valued receptors, or would be irreversible, are considered more significant in terms of decision-making, than those effects which can be reversed or would only affected environmental receptors of low value.

18.3.15 The significance criteria outlined in *Table 18.2* criteria are from the *DMRB HA205/08* (Highways Agency *et al.*, 2008). These criteria guide how the effects should be considered in terms of decision-making. This five point descriptive scale has been applied to the predicted cumulative effects in this chapter.

**Table 18.2: Determining the significance of cumulative effects**

Significance	Effect
Severe	Effects that the decision maker must take into account as the receptor or resource is irretrievably compromised.
Major	Effects that may become a key decision making issue.
Moderate	Effects that are unlikely to have a bearing on whether the project design should be selected, but for which future work may be necessary to improve on current performance.
Minor	Effects that are locally significant.
Not significant	Effects that are beyond the current forecasting ability or are within the ability of the resource to adapt to such change.

### Mitigation

- 18.3.16 Where significant cumulative effects beyond those identified as residual effects from the scheme in isolation are identified, an assessment of the need for additional mitigation (further to that already set out in *Chapters 8 to 17*) has been undertaken.

### 18.4 Baseline conditions (influence of past and present actions)

- 18.4.1 This section provides a brief summary of the baseline conditions where they are relevant to the assessment of cumulative impacts. This takes account of identified cumulative impacts of past and present actions which have led to the current baseline environmental conditions for each topic assessed in this environmental statement.

#### Air quality

- 18.4.2 Past and present growth of traffic in the study area has resulted in exceedances of air quality objectives for the pollutants nitrogen dioxide (NO<sub>2</sub>) and particulates (PM<sub>10</sub>). *Chapter 8* provides details of where air quality management areas (AQMA) have been declared in the study area and the results of recent air quality monitoring in these locations.

#### Cultural heritage

- 18.4.3 *Chapter 9* identifies that past actions such as the construction of the East Coast mainline railway and the construction of the A14 road viaduct in Huntingdon have adversely affected cultural heritage in the study area. The East Coast main line railway in Huntingdon now covers the site of a former bowling green and a possible English Civil War artillery battery, noted on 18<sup>th</sup> century mapping. The A14 road viaduct in Huntingdon has an adverse influence on the character of the Huntingdon Conservation Area, including the setting of many listed buildings.
- 18.4.4 Studies on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) have shown that agriculture is the largest single source of piecemeal damage to archaeology and that sites in areas of arable land use are at much greater risk of damage than those in other uses (DEFRA, 2002).

## Landscape

- 18.4.5 *Chapter 10* identifies the influence of past and present agriculture as greatly influencing the landscape character within the study area.
- 18.4.6 Past and present activities such as gravel extraction and highway development have also had a significant influence. The construction and presence of the A14 viaduct in Huntingdon has a dominant and adverse influence on the character of the west side of Huntingdon.

## Nature conservation

- 18.4.7 The past and present actions of agricultural intensification have led to relatively low biodiversity within the study area. This is recognised by the *Cambridgeshire and Peterborough Biodiversity Partnership's Biodiversity Action Plan* which, in relation to farmland, states that:

*"There is a great deal of data now available which show that many of our once common species of bird, mammal and plant have undergone considerable declines in recent years as a result of changes in agricultural practices (e.g. British Trust for Ornithology surveys)."*

- 18.4.8 *Chapter 11* notes that much of the land affected by the scheme comprises agricultural fields of relatively low ecological value, but that there are a number of valuable habitats present, specifically woodland, standing and running water, swamp and marginal vegetation and semi-improved grassland.

## Geology and soils

- 18.4.9 *Chapter 12* identifies that there are very few past actions that are likely to have caused contamination of soils since the majority of the scheme is located within greenfield land or land which is identified as having only limited contaminative potential. Exceptions to this include existing contaminated sites, including:
- A former fuel storage depot (Buckden) which the scheme passes through;
  - A closed landfill site immediately adjacent to the scheme (Buckden South landfill); and
  - Two permitted and restored landfills, including Buckden North which is adjacent to the scheme and Milton landfill which the scheme would encroach.

## Materials

- 18.4.10 The influence of past development and present actions affects the availability and value of construction materials. *Chapter 13* identifies the planning which has been undertaken in the region to provide primary aggregates for the strategic housing allocations in the region.

### Noise and vibration

- 18.4.11 As with air quality, the growth of traffic as a result of past and present development has led to increases in noise. *Chapter 14* identifies that noise levels have become very high close to parts of the existing A14 and A1 within the scheme's extent. A number of these locations have been identified as important areas (IAs) in the action plans published under the Government's *Environmental Noise Regulations*. The Highways Agency is already investigating and implementing mitigation in these IAs.

### All travellers

- 18.4.12 *Chapter 15* identifies that past highway improvements have severed some of the public rights of way network. Furthermore the increased traffic volumes on roads have made crossing highways hazardous. In some places no provision to cross safely has been made. The negative influence of past highway development on the public rights of way and dangerous crossings is also identified as a key issue in the *Cambridgeshire Rights of Way Improvement Plan (ROWIP)* (Cambridgeshire County Council, 2005).
- 18.4.13 Traffic growth has also led to congestion and stressful driving conditions as the growth in traffic has outstripped the capacity of the existing A14.
- 18.4.14 Recent measures to help combat congestion through the A14 transport corridor include the introduction of the Cambridgeshire Guided Busway which provides a regular service between Cambridge, Longstanton, St Ives and Huntingdon, and also incorporates the National Cycle Network Route 51.
- 18.4.15 The contribution of the Cambridgeshire Guided Busway to a reduction in traffic congestion is taken into account in the traffic model that underpins the EIA for the scheme.

### Community and private assets

- 18.4.16 *Chapter 16* identifies that the economic development of the study area is greatly influenced by agriculture. However, recently the growth in hi-tech industries in particular has led to growth and housing pressure in and around Cambridge and surrounding settlements.

### Road drainage and the water environment

- 18.4.17 *Chapter 17* identifies that six of the seven main rivers within the study area for that assessment have been heavily modified by past development. The chapter identifies that nutrients from agricultural practices and hazardous substances are the main pressures on groundwater quality in the study area.

### Baseline summary

- 18.4.18 The intensification of agriculture is a notable past action that has affected many aspects of the environmental baseline. More recent actions resulting in rapid economic growth have interacted to lead to traffic growth and congestion and associated issues such as noise and a decline in air quality.

**18.5 Identification of potential cumulative effects**

- 18.5.1 *Table 18.3* sets out residual impacts of the scheme and the mechanisms through which cumulative effects or impact interactions could occur.

**Table 18.3: Potential cumulative effects and impact interactions**

<b>EIA topic</b>	<b>Residual impact of the scheme (summary)</b>	<b>Key receptors or resources</b>	<b>Potential cumulative effect or impact interaction</b>
<b>Air quality</b>	<p>With mitigation, no significant residual effects are likely during construction.</p> <p>The assessment of operational effects takes account of traffic generated by predicted future development and therefore takes account of additive impacts.</p> <p>Beneficial impacts have been predicted from the scheme for Huntingdon and settlements along the existing A14.</p> <p>Elsewhere, some receptors along the scheme are predicted to experience an increase in air pollutant concentrations; however no exceedances of air quality objectives are predicted.</p>	<p>Huntingdon town centre AQMA; and Hemingford – Fenstanton A14 AQMA.</p>	<p>The assessment already takes account of the cumulative effect of future development generating traffic therefore no further cumulative effects assessment in relation to air quality is required.</p> <p>There is a potential for impact interactions between air quality and other factors, such as facilitation of active modes of transport, to have synergistic effects on human health.</p>

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Cultural heritage</b>	<p>Construction of the scheme has been assessed to result in a number of adverse impacts on archaeological remains, several historic buildings and the historic landscape.</p> <p>The larger effects tend to be on assets within Huntingdon and Offord Cluny (including moderate adverse impacts on historic buildings in Huntingdon and Offord Cluny Conservation Areas) but there would also be slight effects on buildings in a number of the other villages and locations close to the route.</p> <p>During operation of the scheme, adverse and beneficial impacts have been identified on Huntingdon Conservation Area and historic buildings around Mill Common, adverse impacts have been identified on the setting of historic buildings within the scheme mainline study area, and beneficial impacts on four conservation areas have also been identified.</p> <p>Operation of the scheme would have neutral impacts on the historic landscape.</p>	<p>Mill Common; Views Common; Huntingdon Conservation Area; Offord Cluny Conservation Area; Fen Drayton Conservation Area; and All Saints Church, Lolworth.</p>	<p>Cumulative effects would occur if other reasonably foreseeable developments affect the same assets.</p> <p>The cultural heritage assessment presented in <i>Chapter 9</i> is already synergistic in that it considers the setting of heritage features and factors such as air quality, noise and landscape as well as direct physical impacts and thus no further assessment in required in this respect.</p>

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Landscape</b>	<p>Slight to large adverse effects upon landscape character are predicted as a consequence of constructing new highways infrastructure. However, the removal of the viaduct within Huntingdon would enhance local townscape quality resulting in large beneficial effects.</p> <p>Very large adverse effects are predicted upon visual receptors as a result of the introduction of major highway infrastructure to the rural landscape and the removal of existing vegetation.</p> <p>However, very large beneficial effects are also predicted upon visual receptors as a result of screening and the removal of the viaduct in Huntingdon.</p>	<p>Huntingdon; Mill Common; Views Common; Public Rights of Way; and Visual receptors of Brampton junction, Swavesey junction, Bar Hill junction, and Girton interchange.</p>	<p>Cumulative effects would occur if other reasonably foreseeable development affects the same landscape and visual receptors.</p>

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Nature conservation</b>	Neutral/slight positive biodiversity gain is likely as a result of the landscape proposals.	Brampton Meadow SSSI.	<p><i>Chapter 11</i> considers potential cumulative impacts from the scheme and other developments within 1km, and predicts no significant effects in terms of:</p> <ul style="list-style-type: none"> <li>• habitat loss;</li> <li>• changes in environmental conditions (i.e. air quality, and water quality); and</li> <li>• severance of habitats.</li> </ul> <p>However, there may be a potential cumulative beneficial effect on biodiversity in the study area if other reasonably foreseeable development is also likely to give rise to permanent habitat gain. Therefore this potential impact is considered further in this assessment.</p> <p><i>Chapter 11</i> also considers the synergistic effects upon habitat from changes in traffic, noise and lighting in addition to direct loss. Therefore interactive impacts are not considered further.</p>
	Construction of the scheme is likely to result in slight adverse, temporary habitat loss.	Habitats generally and terrestrial invertebrates.	
	Construction of the scheme is likely to have moderate adverse temporary impacts on bats.	Bats.	
	Slight positive permanent habitat gain is likely during operation as a result of the landscape proposals.	Habitats generally; Aquatic invertebrates; Terrestrial invertebrates; Fish; Great crested newt; Water vole; and Bats.	
	Moderate adverse permanent effects from disturbance during operation.	Breeding birds (grasshopper warbler ( <i>Locustella naevia</i> ) and Cetti's warbler ( <i>Cettia cetti</i> )) and bats.	

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Geology and soils</b>	Interaction with contamination (including gases and vapours) within soils and groundwater during construction activities around Milton landfill and former Buckden fuel depot.	Human health (construction workers).	Mechanism for cumulative effects or impact interactions only likely where other development affects same sites during the scheme's construction period.
	Localised risk of mobilisation of contamination and creation of preferential pollution pathways during construction activities close to the former Buckden fuel depot, Buckden South landfill, Buckden North landfill and Milton landfill.	Groundwater aquifers and surface water bodies.	Cumulative effects could occur where other development affects same sites during the scheme's construction period.
	Beneficial impact of increased hard standing reducing infiltration and leachate generation during operation.	Groundwater aquifers and surface water bodies.	This minor residual impact was identified in relation to very localised ground conditions and therefore cumulative effects or impact interactions are unlikely so not considered further.
	Localised risks to structures within the scheme as a result of accumulation of explosive ground gases within voids and confined spaces resulting in explosion.	Structures at Milton Landfill, Buckden Depot, Buckden South landfill, Buckden North landfill.	This minor residual impact was identified in relation to very localised ground conditions and therefore cumulative effects or impact interactions are unlikely so not considered further.
	Risk of destruction or damage to soil resulting from practices involved with excavation / stripping, storage and compaction of the soil.	Agricultural land across the scheme.	There may be additive impacts upon damage to soil in combination with other developments. However, insufficient information is available on other developments to quantify this effect. Proposed mitigation for the scheme is set out in <i>Chapter 12</i> . No further assessment of cumulative impacts has been undertaken.

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Materials</b>	The assessment identified slight to moderate adverse residual impacts in relation to resources and waste during construction.	Primary resources and construction waste.	There may be additive impacts upon material use and waste in combination with other developments. However, insufficient information is available on other developments to quantify this effect. Proposed mitigation for the scheme is set out in <i>Chapter 13</i> . No further assessment of cumulative impacts has been undertaken.
<b>Noise and vibration</b>	Temporary adverse effects are predicted for some areas during construction. Beneficial effects on a large number of properties are predicted for Huntingdon during operation. Results are more mixed for other locations with improvements in some areas and an increase of traffic noise in others.	Huntingdon.	The assessment already takes account of the cumulative effect of predicted future development generating traffic therefore no further cumulative effects assessment in relation to noise and vibration is required. There could be an interaction between noise and other factors that would lead to a loss of tranquillity or urbanisation of the landscape.

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Effects on all travellers</b>	Disruption to people's journeys on public rights of way and other routes used by non-motorised users (NMU) within the scheme footprint during construction (slight to major adverse).	Human health and wellbeing.	Cumulative effects could occur where other development affects the same public rights of way or routes within 5km of the scheme (i.e. could impact journeys along overall route).
	Permanent loss of rural character of public rights of way.	Human wellbeing.	Cumulative effects could occur where other development affects the same or other public rights of way in currently rural locations south of the A14 (vicinity of proposed Huntingdon southern bypass).
	Improved provision for journeys by non-motorised modes for settlements within A14 corridor.	Human health.	Cumulative impacts could occur where other development proposals include new NMU routes with linkages to new scheme NMU routes.
	<p>A significant adverse residual effect on driver stress during operation is predicted for part of the A1 between Brampton Hut to Brampton junction, whilst a significant beneficial effect on driver stress is predicted for the existing A14 route between Godmanchester junction to Trinity Foot junction. This assessment is based upon the predicted average flows and speeds in the traffic model and therefore already takes account of the additive effects on traffic from the cumulation of predicted future development.</p> <p>Adverse effects on driver stress are predicted due to disruption to the road network during construction.</p>	Human health.	<p>The assessment of operational effects on driver stress already takes account of the cumulative effect of future development generating traffic therefore no further cumulative effects assessment in relation to driver stress during operation is required.</p> <p>Temporary cumulative effects during construction could occur where construction activities are likely to affect the highway network during the same construction period as the scheme.</p>

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Community and private assets</b>	Loss of agricultural land.	Food/farming/ human health.	Cumulative effects could occur where other development affects greenfield locations.
	Adverse effects on farm businesses.	Human health, local economy, population.	Cumulative effects would occur if other development affects land under the same ownership. However there is insufficient information on other schemes to identify this and therefore no further assessment of this potential impact has been undertaken.
	Employment opportunities during construction phase.	Local economy.	The combination of proposed development is likely to provide construction related job opportunities for the reasonably foreseeable future.
	Beneficial effects on development land through improved access to allocated land.	Local economy, population.	On the basis that this assessment already considers development allocations, no further assessment of the cumulative impacts on access to land is considered.
	Beneficial and adverse effects on community severance are identified for communities within the study area.	Ellington, Huntingdon, Brampton, Godmanchester, Buckden, Offord Cluny and Offord D'Arcy, Hilton, Fenstanton, Conington, Fen Drayton.	Cumulative effects could occur where other developments may contribute to severance or relief from severance in these communities.
	Temporary severance during construction is identified for some communities close to the scheme.	Boxworth, Lolworth, Longstanton, Bar Hill, Dry Drayton, Madingley, Histon, Impington, Cambridge and Milton.	Cumulative effects could occur where other developments affect the same communities and there is temporal overlap during the construction phases.

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
<b>Road drainage and the water environment</b>	Increase in flood water levels during operation for three watercourses (but no increase in flood risk to property).	Ellington Brook, Brampton Brook and river Great Ouse.	Cumulative effects could occur where other developments result in increased flood water levels on the same water bodies.
	Adverse effects on water quality during construction as a result of earthworks, construction haul routes, and other activities.	Water bodies close to construction sites and haul routes.	Cumulative effects could occur where construction activities are likely to affect the same water bodies with the same construction period as the scheme.
	Adverse effects during operation on water quality from routine run-off and accidental spillages.	Water bodies downstream of highway infrastructure.	Cumulative effects could occur from urban development generally where drainage affects the same water bodies.
	Potential effects on buildings and infrastructure from ground settlement due to changes in groundwater levels as a result of dewatering at borrow pits during construction.	Existing infrastructure, existing buildings, surface water features and Park Road grassland.	This potential effect is unlikely to be cumulative since other developments are unlikely to have borrow pits and excavations of the same scale. Furthermore, the potential risk is likely to be managed during construction through additional measures, depending upon the results of further ground investigation. No likely cumulative impact is predicted.
	Disruption to surface water flows and levels due to changes in groundwater levels as a result of dewatering at borrow pits during construction.	Surface water bodies within influence of groundwater bodies at borrow pits.	This potential effect is unlikely to be cumulative since other developments are unlikely to have borrow pits and excavations of the same scale. Furthermore, the potential risk is likely to be managed during construction through additional measures, depending upon the results of further ground investigation. No likely cumulative impact is predicted.

EIA topic	Residual impact of the scheme (summary)	Key receptors or resources	Potential cumulative effect or impact interaction
	Contamination of surface waters due to contaminated groundwater discharge from dewatering of borrow pits 1 and 2 during construction.	Surface water bodies close to borrow pits.	This potential effect is unlikely to be cumulative due to the localised nature of the source of impact. Furthermore, the potential risk is likely to be managed during construction through additional measures, depending upon the results of further ground investigation. No likely cumulative impact is predicted.
	Impact upon Park Road Grasslands due to local reduction in groundwater level caused by dewatering at borrow pit 2.	Park Road Grasslands.	This potential effect is unlikely to be cumulative due to the localised nature of the source of impact. Furthermore, the potential risk is likely to be managed during construction through additional measures, depending upon the results of further ground investigation. No likely cumulative impact is predicted.
	Impairment of groundwater quality in the River Terrace Deposits aquifer due to contaminated recharge at flood compensation areas.	River Terrace Deposits aquifer.	Cumulative effects could occur should other developments' flood compensatory measures affect the same aquifer.

18.5.2 After considering the likely significant residual effects of the scheme (as reported in *Chapters 8 to 17*) and whether there is a likely potential mechanism that would lead to cumulative effects or impact interactions (as discussed in *Table 18.3*), the potential cumulative impacts investigated further within this assessment are as follows:

- Impacts on historic landscapes (common land; small scale settlement; recreation; 20<sup>th</sup> century agriculture with relict 18<sup>th</sup>-19<sup>th</sup> century boundaries; 18<sup>th</sup>-19<sup>th</sup> century enclosures; and woodland);
- Impacts on known archaeological remains (crop marks; enclosures; historic boundaries; peat deposits; barrows; ditch systems; evidence of Iron Age and Romano-British settlement and other activity in Brampton area; archaeological remains at Mill Common and Views Common; and Roman Roads);
- Impacts on historic buildings (Huntingdon Conservation Area; listed buildings in Huntingdon; World War II pillboxes; All Saint's Church, Lolworth; Conington Park and Hall; listed buildings in Boxworth, Offord Cluny and Brampton; and American Military Cemetery, Gardens of Boxworth House);

- Urbanisation of landscape character (structures, lighting and traffic noise);
- Disturbance to the former Buckden fuel depot, Buckden South landfill, Buckden North landfill and/or Milton landfill during construction;
- Biodiversity enhancement from landscape proposals;
- Effects on biodiversity of Brampton Meadow SSSI;
- Disturbance to bats during construction;
- Disturbance to breeding birds and bats during operation;
- Severance, loss and disturbance of habitats during construction;
- Improved opportunities for active modes of travel (walking and cycling);
- Disruption to public rights of way (PRoW) and other routes during construction;
- Adverse effects on driver stress during construction/disruption to highway network during construction;
- Loss of agricultural land;
- Employment opportunities for construction phase;
- Impacts upon community severance (communities affected include: Ellington, Huntingdon, Brampton, Godmanchester, Buckden, Offord Cluny and Offord D'Arcy, Hilton, Fenstanton, Conington, and Fen Drayton);
- Temporary community severance during construction (communities affected include: Boxworth, Lolworth, Longstanton, Bar Hill, Dry Drayton, Madingley, Histon, Impington, Cambridge and Milton);
- Increased floodwaters at Ellington Brook, Brampton Brook, and river Great Ouse;
- Temporary effects on water quality from construction activities; and
- Effects on water quality during operation from routine surface water run-off and accidental spillages. Impairment of groundwater quality in the River Terrace Deposits aquifer due to contaminated recharge at flood compensation areas.

18.5.3 The reasonably foreseeable development identified to inform the assessment is set out in *Table 18.4*. The locations of these developments are presented on *Figure 18.1*.

- 18.5.4 For each identified development, consideration was made as to the likelihood that the development could take place at the same time as the scheme or affect similar receptors or resources. Where there is considerable uncertainty over the nature and timescales of the development, the developments were deemed to be not reasonably foreseeable and therefore scoped out of the assessment. *Table 18.4* provides details where this was the case.

**Table 18.4: Reasonably foreseeable development identified within the study area (refer to Figure 18.1)**

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
<b>Cambridge City Council</b>				
Station area redevelopment (cb1)	4.5km	<p>Allocated in the Cambridge Local Plan for approximately 650 dwellings, B1(a) and B1(b) employment, a mix of Classes A1, A2, A3, A4 and A5, a hotel, leisure and arts uses, community uses and civic uses.</p> <p>Outline planning permission (08/0266/OUT) and associated reserved matters applications have been approved for phase 1 comprising 331 residential units, 1,250 student units, office space, retail space, hotel, infrastructure works and highway improvements.</p> <p>Work has commenced on the redevelopment.</p>	<p><i>cb1 Cambridge Environmental Statement</i> (DTZ, 2008).</p> <p><i>cb1 Cambridge Public Realm and Landscape Strategy Addendum</i> (Robert Myers Associates, January 2010).</p> <p>cb1 Cambridge City Centre website:  <a href="http://www.cb1cambridge.eu/">http://www.cb1cambridge.eu/</a></p>	This project is geographically distinct from the scheme (set within the city centre 4.5km away) and although there is potential for temporal overlap during construction, the environment which the cb1 development would affect is remote and distinct from that which the scheme affects. Therefore this project was scoped out of the cumulative effects assessment.
West Cambridge (Cambridge University)	2km	The West Cambridge Site covers approximately 65ha and is allocated for uses related to the University of Cambridge within the <i>Cambridge Local Plan</i> . The overall site was subject to an outline planning approval in 1999 and reserved matters and full planning applications have been approved on a large number of plots since 1999.	<i>Cambridge Local Plan 2006</i> Cambridge City Council.	The development as approved in 1999 is largely complete and therefore forms part of the environmental baseline of this EIA. It has been scoped out of further consideration in relation to the assessment of cumulative effects.

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
<b>Cambridge City Council/South Cambridgeshire District Council</b>				
Cambridge east	3km	<p>An Area Action Plan has been prepared for Cambridge East and has been adopted by both Cambridge City Council and South Cambridgeshire District Council. It identifies the site for a sustainable new urban quarter of approximately 10,000 to 12,000 dwellings and associated development.</p> <p>An outline planning application is currently under consideration for the first phase on land north of Newmarket Road (S/2682/13/OL). The application includes for up to 1,300 dwellings, a primary school, a food store, community facilities, landscaping and infrastructure works.</p>	<p><i>Cambridge East Area Action Plan, Final Environmental / Sustainability Report</i>, (Cambridge City Council, South Cambridgeshire District Council and Scott Wilson).</p> <p><i>Local Development Framework Cambridge East Area Action Plan Development Plan Document</i>, Cambridge City Council, South Cambridgeshire District Council, Adopted February 2008.</p> <p><i>Land north of Newmarket Road, Cambridge, Environmental Statement</i> (Terence O'Rourke <i>et al.</i> for Marshall of Cambridge Airport Properties Limited, December 2013).</p> <p><a href="http://www.scambs.gov.uk/content/cambridge-east">http://www.scambs.gov.uk/content/cambridge-east</a></p>	This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
University site (north-west Cambridge)	0km (adjacent)	<p>An Area Action Plan has been prepared for North West Cambridge and has been adopted by both Cambridge City Council and South Cambridgeshire District Council. It relates to the land between Madingley Road and Huntingdon Road.</p> <p>Outline planning permission (11/1114/OUT and S/1886/11) has been approved for up to 3,000 dwellings, student accommodation, employment floor space, community facilities, sports centre, health care, school, police, hotel, open space, and associated infrastructure.</p>	<p><i>North West Cambridge Environmental Statement</i> (Cambridge University, March 2012).</p> <p><i>North West Cambridge, September 2011, Health Impact Assessment.</i></p> <p>North West Cambridge website: <a href="http://www.nwcambridge.co.uk/">http://www.nwcambridge.co.uk/</a></p>	<p>This is a reasonably foreseeable development within close proximity of the scheme and with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.</p>

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
Cambridge northern fringe - east	0.5km	<p>The Cambridge Northern Fringe East site is approximately 75ha of which 52.64ha are within Cambridge City Council's boundary and allocated within the <i>Cambridge City Local Plan</i> for 35ha of housing, 6ha of mixed use commercial uses, 0.5ha for retail use, community facilities, a primary school, aggregate works, open space and waste management facilities. No planning applications have been put forward for development at this site to date.</p> <p>The remainder of the site is allocated in the South Cambridgeshire <i>Site Specific Policies Development Plan Document</i> for the development of a railway station at Chesterton Sidings. A planning application (C/05001/13/CC) has been approved by South Cambridgeshire District Council's Planning Committee for the development of the railway station and is currently awaiting the completion of a Section 106 agreement. This scheme is also included in the <i>Local Transport Plan 3</i>.</p>	<p><i>Local Development Framework: Site Specific Policies Development Plan Document</i>, Adopted January 2010.</p> <p><i>Core Strategy Development Control Policies Site Specific Policies Development Plan Documents Final Environmental / Sustainability Report.</i></p> <p><i>Sustainability Appraisal of the South Cambridgeshire Site Specific Policies DPD Supplementary Report</i> - for consultation.</p> <p><i>Cambridgeshire Local Transport Plan 2011-2031</i>, June 2014 and <i>SEA draft Environmental Report</i>, June 2014.</p> <p><i>Cambridge Science Park Station and Interchange Environmental Statement</i> (Carter Jonas, June 2013).</p>	<p>This is a present and reasonably foreseeable development.</p> <p>It is geographically distinct from the scheme (set within the city centre) but there is potential for temporal overlap during construction. This was scoped into the assessment of cumulative effects.</p>

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
Darwin Green/NIAB (North West Cambridge – Huntingdon Road to Histon Road)	0.3km	<p>Allocated in the <i>Cambridge Local Plan</i> for a large residential development of 1000 dwellings and associated facilities including a school, shops and community facilities. Part of the site comprises land used by the National Institute of Agricultural Botany (NIAB).</p> <p>Outline planning permission (07/0003/OUT) was approved in 2013 by Cambridge City Council for 1,593 dwellings, a primary school, retail units, recreation facilities, a green corridor and associated infrastructure works. A reserved matters application currently under consideration.</p> <p>In addition, a full planning application for the formation of vehicular, pedestrian and cycleway access to Histon Road, drainage and landscaping works was submitted to South Cambridgeshire District Council (S/0001/07/F) and was approved in 2013. A single Environmental Statement was prepared to cover both applications.</p>	<p><i>Land between Huntingdon Road and Histon Road, Cambridge, Environmental Statement</i> (Bidwells, 2009).</p> <p><i>Land between Huntingdon Road and Histon Road, Cambridge, Supplementary Environmental Statement</i> (Bidwells, 2013).</p>	<p>This is a reasonably foreseeable development within close proximity of the scheme and with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.</p>

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
<b>South Cambridgeshire District Council</b>				
Cambridge Northern Fringe West (Orchard Park)	0km (adjacent)	<p>The land at Orchard Park bounded by the A14, Histon Road and King Head Road is allocated within the <i>South Cambridgeshire Site Specific Policies Development Plan Document</i> for a sustainable housing led mixed use development providing a minimum of 900 dwellings, a public transport interchange, business development, a primary school, a local centre and public open space.</p> <p>The majority of the site has now been developed.</p>	<p><i>South Cambridgeshire Site Specific Policies Development Plan Document</i> Adopted January 2010</p> <p><i>Sustainability Appraisal of the South Cambridgeshire Site Specific Policies DPD Supplementary Report</i> - for consultation.</p>	<p>The development is largely complete and therefore forms part of the environmental baseline of this EIA. It has been scoped out of further consideration in relation to the assessment of cumulative effects.</p>
Northstowe	1.7km	<p>The <i>South Cambridgeshire Core Strategy Development Plan Document</i> sets out a vision to create a sustainable new town close to but separate from the villages of Longstanton and Oakington. The new town of Northstowe is therefore proposed to consist of up to 10,000 new houses. The <i>Northstowe Area Action Plan</i> was adopted in 2007 setting out the vision for the overall site.</p> <p>In December 2007 the Joint Promoters (The Homes and Communities Agency, previously English Partnerships) and Gallagher Longstanton Ltd) submitted an outline planning application for approximately 9,500 dwellings and associated facilities and</p>	<p><a href="http://www.northstowe.com/">http://www.northstowe.com/</a></p> <p><a href="https://www.scambs.gov.uk/services/northstowe">https://www.scambs.gov.uk/services/northstowe</a></p> <p><i>Northstowe Phase 1 Environmental Statement</i></p> <p><i>Northstowe Phase 1 Health Impact Assessment</i></p> <p><i>Northstowe Phase 2 Environmental Statement</i> (August 2014)</p> <p><i>Northstowe Phase 2 Health Impact Assessment</i> (August 2014)</p>	<p>This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.</p>

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
		<p>infrastructure, together with three full applications for highway infrastructure. These applications remain undetermined.</p> <p>In 2013 the <i>Northstowe Development Framework Document</i> setting out a refreshed master plan for the development principles of Northstowe was approved and outline planning permission was granted for phase 1 of the development in April 2014 (S/0388/12/OL). Phase 1 comprises up to 1,500 dwellings, a primary school, community centre, business use, household recycling centre, recreational space and associated infrastructure.</p> <p>In August 2014, an outline planning application for phase 2 of the development was submitted (S/2011/14/OL). Phase 2 comprises up to 3,500 new houses, a town centre, a new road to the south of Northstowe, two primary schools, a secondary school, sports facilities and open space.</p>		

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
Land north of Waterbeach	4km	The emerging <i>South Cambridgeshire Local Plan</i> proposes a new town of 8,000 to 9,000 dwellings and associated uses at the former Waterbeach Barracks and land to the east and north. The first housing is expected to be delivered in 2026.	<i>Sustainability Appraisal Report of the South Cambridgeshire Local Plan Submission</i> (March 2014) <i>South Cambridgeshire Proposed Submission Local Plan 2011 – 2031</i>	These developments are geographically distinct from the scheme (at the edge of the study area) and unlikely to be constructed within the same timeframe. Due to the distance from the A14 scheme and the difference in timeframe for construction it is not considered likely that non-traffic related cumulative effects would occur and therefore these developments are not considered further in this assessment. Furthermore there is limited environmental information available upon which to base an assessment for these allocations.
Bourn Airfield	5km	The emerging <i>South Cambridgeshire Local Plan</i> proposes a new village of approximately 3,500 dwellings south of the A428 at Bourn Airfield. The first housing completions are not expected until 2022 with much of the development not expected to come forward until after the plan period (2011 – 2031).	<i>Sustainability Appraisal Report of the South Cambridgeshire Local Plan Submission</i> (March 2014) <i>South Cambridgeshire Proposed Submission Local Plan 2011 – 2031</i>	

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
<b>Huntingdonshire District Council</b>				
Huntingdon West	0km (adjacent)	The <i>Huntingdon West Area Action Plan</i> was adopted in 2011 and covers an area where significant change is expected. It is intended that the west of Huntingdon will be a vibrant part of the town enjoyed by residents, workers and visitor. To achieve this it is proposed to develop new and improved transport routes, provide modern residential, retail and office development, and enhance and enlarge Hinchbrook Country Park.	Huntingdon West Area Action Plan and Sustainability Appraisal	This is a reasonably foreseeable development within close proximity of the scheme and with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.
RAF Brampton	0km (adjacent)	The RAF is vacating its RAF Brampton base. Huntingdonshire District Council has prepared a draft urban design framework. The site has now been acquired by the developers Campbell Buchanan who submitted an outline planning application for 402 dwellings in September 2013 (1301178OUT). The decision is pending.	<i>RAF Brampton Draft Urban Design Framework</i> (Huntingdonshire District Council, December 2011) <i>Heritage Statement</i> (Defence Infrastructure Organisation, 2013) <i>Ecological Appraisal</i> , (Defence Estates 2008)	This is a reasonably foreseeable development within close proximity of the scheme and with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
Land north-west of Bearscroft Farm	1.3km	Outline planning permission (1200685OUT) has been approved for residential development to provide up to 753 dwellings, a primary school and associated improvements.	<i>Bearscroft Godmanchester, Environmental Statement</i> (The Fairfield Partnership, April 2012)	This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.
Alconbury Weald	1.6km	An outline planning application (1201158OUT) is currently awaiting determination for up to 290,000sqm of employment floor space; up to 5000 dwellings; a mixed use hub and mixed use neighbourhood facilities, including retail, commercial, leisure, health, place of worship and community uses; non-residential institutions including primary schools, nurseries, a secondary school and land reserved for post 16 education provision; open spaces, woodlands and sports provision; retention of listed buildings; associated infrastructure; reserve site for a railway station and ancillary uses; and associated demolition and ground works.	<i>Alconbury Weald EIA Environmental Statement</i> (Urban & Civic, July 2012)	This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
Common Barn Wind Farm, Southoe	4km	In July 2013 planning permission (1200803FUL) was granted on appeal for the erection of three 125m wind turbines and associated development on land at Church Farm, Rectory Lane, Southoe.	<i>Common Barn Wind Farm Environmental Statement</i> (TCI Renewables)	This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.
Woolley Hill Wind Farm, Ellington	1.5km	In March 2012 planning permission (1001741FUL) was granted on appeal for the erection of four 130.5m wind turbines and associated development on land east of Whiteleather Lodge, Woolley Hill, Ellington.	<i>Woolley Hill Wind Farm Environmental Statement</i> (RES, 2010)	This is a reasonably foreseeable development with potential to be constructed during the same timeframe as the scheme. This was scoped into the assessment of cumulative effects.
<b>Highways Agency</b>				
A14 Junction 31 to 32 Eastbound and Westbound improvements	0km (adjacent)	As part of the <i>Targeted Improvement Programme (TIP)</i> and <i>Pinch Point Programme (PPP)</i> The Highways Agency is currently adding an additional lane in both eastbound and westbound directions of the A14 between junctions 31 (Girton) and 32 (Histon). It is also improving the existing westbound slip roads at the Girton Interchange, junction 31 of the A14, in order to increase their capacity. Work commenced in April 2014 and is anticipated to be completed in early 2015.	The project was determined not to give rise to likely significant effects on the environment and therefore not made subject to EIA in accordance with Part VA of the Highways Act 1980 (as amended).	This project is considered as part of the baseline environmental conditions assessed. On the basis that the project is not likely to have significant effects it has been scoped out of further consideration in relation to the assessment of cumulative effects.

Development	Approx. distance from scheme	Description and planning status	Availability of environmental information	Inclusion in assessment
<b>Network Rail</b>				
Level crossing closure programme	1.25km	Network Rail is currently carrying out a feasibility study to explore options for the closure of level crossings on the East Coast main line. The proposals include the closure of the level crossing at Offord and the provision of a new road bridge to the north of the village.	Network Rail is currently at the initial options feasibility stage and no environmental information is currently available.	As the project has not yet been confirmed (i.e. it has not yet gone through the statutory processes), it is not considered to be reasonably foreseeable. Furthermore significant effects are not likely therefore it has been scoped out of further consideration in relation to the assessment of cumulative effects.

- 18.5.5 The residual impacts of the scheme that could potentially give rise to cumulative effects are set out in *Table 18.5*. Where a proposed foreseeable development is also predicted to have a similar impact, this is indicated in *Table 8.5* using the symbols set out in the key below.
- 18.5.6 Different terminology is applied in the various EIA documents reviewed. For example, some assessments use terms such as “substantial” whereas others use “major”. The key to *Table 18.5* takes account of the range of terminology used in different assessments.

#### **Key to *Table 18.5***

- Impacts predicted to occur from the development at a small scale (described as minor or slight, or low in the project environmental assessment), or would be limited in extent and localised within the scheme area. These impacts would not be considered significant at the individual project level but could lead to significant cumulative effects where they are geographically clustered or where several projects affect the same receptors, reducing their regenerative capacity
- Impacts predicted to occur from the development at a significant scale (described as moderate, major, high or large in the project environmental assessment) and/or would be widespread throughout the scheme area.
- No significant impacts predicted (including neutral and negligible effects).

**Table 18.5: Identification of potential cumulative impacts in combination with reasonably foreseeable development**

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PROW and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
A14 Cambridge to Huntingdon improvement scheme	○	●	●	●	○	○	○	○	○	○	●	●	●	○	●	○	○	○	○	Several communities affected by severance to a minor or moderate degree.
Land north of Newmarket Road (Cambridge East)	-	○	○	○	-	○	-	-	○	○	○	-	●	○	-	-	-	-	-	

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PRow and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
University Site (North West Cambridge)	○	●	○	○	-	○	-	-	○	○	○	○	●	○	-	-	-	-	-	North West Cambridge site predicted to re-define the urban edge. Townscape is extended but remaining rural areas would be retained.
Chesterton Sidings (Cambridge Northern Fringe)	-	-	-	-	-	○	-	-	○	○	○	-	-	○	-	-	-	-	-	
Darwin Green/NIAB (North West Cambridge)	-	○	-	-	-	○	-	-	○	○	○	○	○	○	-	-	-	-	-	Affects environment on urban fringe near Girton.

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PRow and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
Northstowe (Phase 1 and 2)	○	○	○	○	-	○	-	-	○	○	○	-	○	○	-	-	-	-	-	Visual impacts largely concentrated on Longstanton and location of new Southern Access Road.

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PROW and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
Huntingdon West	-	-	○	-	-	○	-	-	○	○	-	-	-	○	○	-	-	-	-	These identified impacts are relatively uncertain due to the strategic nature of the assessment. Vision of Action Plan is to improve accessibility and inter-relationships between this area and the rest of the town.

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PRoW and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
RAF Brampton	-	-	○	-	-	○	-	-	○	○	○	○	-	○	○	-	-	-	-	Urban Design Framework requires biodiversity enhancement. Project objective is to provide good links to employment and village centre.
Land north west of Bearscroft Farm	-	○	-	○	-	○	-	-	○	○	-	-	○	○	-	-	-	-	-	

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PROW and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
Alconbury Weald	-	○	○	○	-	●	-	-	○	○	○	-	●	○	-	-	-	-	-	The application includes new woodlands, wildlife habitat areas, managed grassland and orchard. Bat roost sites have been confirmed on site. Great crested newts have been confirmed on site.

Potential cumulative impacts (abridged)	Impacts on historic landscapes	Impacts on known archaeological assets	Impacts on historic buildings	Urbanisation of landscape	Impacts on Buckden depot, Buckden or Milton landfills	Biodiversity enhancements through proposals	Impacts on Brampton Meadow SSSI	Disturbance to breeding birds and bats	Severance / disturbance / loss of habitats	Improved opportunities for active modes of travel	Driver stress / disruption to PRow and NMU routes	Disruption to highways during construction	Loss of agricultural land	Construction employment	Community severance	Increased flood levels at identified watercourses	Water quality - construction	Water quality - operation	Impacts on aquifer (e.g. River Terrace Deposits)	Notes
Common Barn Windfarm, Southoe	-	-	-	-	-	○	-	-	○	-	-	-	-	○	-	-	-	-	-	Very minor agricultural land take involved so assessed as negligible for cumulative effects.
Woolley Hill Wind Farm, Ellington	-	-	○	-	-	○	-	-	○	-	○	○	-	○	-	-	-	-	-	Very minor agricultural land take involved so assessed as negligible for cumulative effects.

## 18.6 Significance of cumulative effects and impact interactions

### Cultural heritage

#### *Impacts on historic landscape*

- 18.6.1 Where effects upon historic landscape have been predicted for other reasonably foreseeable development, the residual effects have been predicted to be slight or minor. Furthermore there is no geographical overlap in the effects identified. On the basis that the effects would be relatively localised to the developments, cumulative effects would not be significant.

#### *Impacts on archaeological remains*

- 18.6.2 The types of archaeological remains most at risk from the scheme are crop marks; enclosures; historic boundaries; peat deposits; barrows; ditch systems; evidence of Iron Age and Romano-British settlement and other activity in Brampton area; archaeological remains at Mill Common and Views Common; and Roman roads.

- 18.6.3 A review of the environmental assessments for the other reasonably foreseeable developments in the study area has mostly indicated minor and localised effects upon archaeological assets and there is no geographical overlap with the scheme. Although there is potential for cumulative effects to result from various minor impacts, given the isolated, small scale and localised nature of the archaeological assets that are predicted to be impacted, no significant cumulative effects are likely because they would be dispersed through the study area. The development with the largest potential effect on archaeological remains is the university site in north-west Cambridge. However there are no significant residual impacts predicted from the scheme in this area so cumulative effects would not be significant.

#### *Impacts on historic buildings*

- 18.6.4 The other reasonably foreseeable developments in the study area would not affect the same listed buildings or conservation areas as predicted for the scheme, with the exception of Huntingdon.
- 18.6.5 The main potential geographical overlap between the scheme and other reasonably foreseeable development is within the Huntingdon Conservation Area (which includes both Mill Common and Views Common). The scheme would have both adverse and beneficial impacts on Huntingdon Conservation Area. Adverse impacts would arise from the construction and operation of the two new link roads across Mill and Views Commons, and beneficial impacts would arise due to the removal of the existing A14 viaduct and a reduction in the traffic levels along the existing A14 carriageway. Beneficial impacts are also expected on Huntingdon Station listed building.

- 18.6.6 All of these areas are located within the *West Huntingdon Area Action Plan (WHAAP)* which seeks to ensure that new development is complementary to the existing natural and historic environment, is of high quality and incorporates sustainable design (refer to *Objective 4* of the *WHAAP*). This is reflected in policy HW9 which requires allocated developments to demonstrate that the proposal has protected the area's heritage by having regard to the conservation area and the setting of any listed buildings. Provided any developments allocated within the *WHAAP* comply with this policy, no significant cumulative effects over and above the effects of the scheme alone are likely on the conservation area and listed buildings.

### Landscape

#### *Urbanisation of landscape character (structures, lighting, traffic noise)*

- 18.6.7 The key potential cumulative effect in relation to landscape is whether the combination of reasonably foreseeable developments, together with the scheme, could lead to a significant urbanising effect on the landscape character. In particular the potential interaction of lighting, noise and loss of green and open space could alter the existing character of the landscape.
- 18.6.8 From a review of the environmental assessments the following developments are predicted to contribute to such a change in landscape character:
- land north of Newmarket Road (Cambridge east);
  - University site (north-west Cambridge);
  - Northstowe (Phase 1 and 2);
  - land north-west of Bearscroft Farm; and
  - Alconbury Weald.
- 18.6.9 The scale of development pressure in Cambridgeshire is leading to incremental change of the landscape character. The scheme, which is proposed to address the issues of traffic generation from the rapid development of the region, would have an additive effect on this incremental change. *Chapter 10* sets out an assessment of the effects of the scheme on landscape, an assessment of future change, and the proposed mitigation for integrating the scheme with the landscape as much as practicable.
- 18.6.10 Overall it is predicted that there would be a major adverse cumulative effect on landscape as a result of the scheme in combination with other major development within the study area.

### Geology and soils (potentially contaminated land)

*Disturbance to the former Buckden fuel depot, Buckden South landfill, Buckden North landfill and/or Milton landfill during construction*

- 18.6.11 No potential impacts from other reasonably foreseeable development have been identified which overlap with the likely significant residual effects of the scheme. The other projects would have no potential impact upon the former Buckden fuel depot, the Buckden landfill sites or the Milton landfill site. Therefore there would not be a significant cumulative effect during construction.

### Nature conservation

*Biodiversity enhancement from landscape proposals*

- 18.6.12 All of the reasonably foreseeable developments have incorporated proposals for habitat mitigation or enhancements to varying degrees. Proposals typically include the planting of new hedgerows and native trees, but also wild flower meadows, ponds and other habitat enhancements. It is unlikely that the scale of the proposed enhancements, even considered cumulatively, would be sufficient to reverse the loss of biodiversity from past agricultural development. However, the effects may be locally significant and therefore cumulative effects are likely to be minor beneficial.

*Positive effects on biodiversity for Brampton Woods SSSI*

- 18.6.13 None of the other reasonably foreseeable development has identified potential effects upon Brampton Wood SSSI and therefore significant cumulative effects upon the SSSI are not likely.

*Disturbance to breeding birds (grasshopper and Cetti's warblers) and bats*

- 18.6.14 None of the other reasonably foreseeable development have identified residual adverse effects on breeding birds (grasshopper and Cetti's warblers) or bats following the adoption of mitigation measures.

*Severance, loss and disturbance of habitats during construction*

- 18.6.15 The environmental assessments for all of the reasonably foreseeable developments have identified slight or minor adverse effects upon ecology during construction.

- 18.6.16 The biggest changes in environmental conditions as a result of this scheme are likely to be along the offline section of the scheme. The major foreseeable development identified within 1km of the scheme, i.e. Cambridge Northern Fringe, Darwin Green and Huntingdon West, are in the north-western and south-eastern ends of the scheme nearest the online sections, reducing the potential for cumulative impacts particularly during the construction. On this basis the cumulative effect of severance, loss and disturbance of habitats during construction is anticipated to be minor.

## All travellers

### *Improved opportunities for active modes of travel (walking and cycling)*

- 18.6.17 All of the reasonably foreseeable developments, with the exception of the wind farms, provide for travel by non-car modes. Many of these link up with proposals for the non-motorised user (NMU) route associated with the scheme so that on completion there would be routes between these areas of new residential development and employment sites. On this basis a major beneficial cumulative effect on opportunities for active modes of travel are likely.

### *Disruption to public rights of way and other routes during construction*

- 18.6.18 Disruption to NMU routes is predicted from most of the foreseeable developments during the construction phases. However, these sites are relatively isolated from each other so would be unlikely to result in multiple impacts upon any single public rights of way (PRoW) or journey by NMU. The exception is the RAF Brampton site which would affect the amenity of footpaths Brampton 3 and 4 (28/3 and 28/4). These footpaths would be “sandwiched” between the footprint of the scheme, close to proposed soil storage areas and borrow pits, and RAF Brampton. Should the construction periods of the two developments overlap, there would be a considerable loss of amenity of these footpaths due to the close proximity of the development. Furthermore, the RAF Brampton proposals would involve the diversion of footpath 4 to the east of Park Farm. However, access would be likely to be maintained and the effects of construction would be temporary. On this basis, the cumulative effect of disturbance on PRoW is predicted to be minor.

### *Adverse effects on driver stress during construction/disruption to highway network during construction*

- 18.6.19 Construction traffic associated with the University site and Darwin Green/ National Institute of Agricultural Botany (NIAB) could lead to cumulative disruption on the highway network in the north-west area of Cambridge, particularly Huntingdon Road, unless carefully managed.
- 18.6.20 There is a potential cumulative effect upon driver stress at Buckden Road from a combination of the scheme and RAF Brampton should the construction phases overlap. The EIAs for Northstowe and land north of Bearscroft have predicted negligible impacts from construction traffic.
- 18.6.21 On this basis, the cumulative impact upon driver stress and the highway network is predicted to be moderate adverse. Where construction phases overlap, further consideration of construction transport management is recommended in order to minimise disruption. Wherever possible the HGV traffic associated with the earthworks for the scheme would avoid the use of the public highway network.

## Community and private assets

### *Loss of agricultural land*

- 18.6.22 The loss of agricultural land was assessed as a major adverse effect of the scheme in *Chapter 16*. Similarly adverse effects have been predicted for the following reasonably foreseeable developments:
- land north of Newmarket Road (Cambridge east);
  - University site (north-west Cambridge); and
  - Alconbury Weald.
- 18.6.23 Minor adverse impacts were predicted for all the other sites with the exception of Huntingdon West, RAF Brampton, Chesterton Sidings and the two wind farms.
- 18.6.24 There would therefore be an incremental loss of good quality agricultural land across the study area from the scheme and other reasonably foreseeable development. *Table 18.6* sets out the predicted quantity of agricultural land that would be lost.

**Table 18.6: Area of high quality agricultural land lost by foreseeable development**

Development	Area of high quality agricultural land lost	Grade
A14 Cambridge to Huntingdon improvement scheme	1145ha	Grade 2 and Grade 3
North of Newmarket Road	37ha	Grade 2 and Grade 3
University site	79ha	Grade 2 and Grade 3a
Northstowe Phase 1	36.04ha	Grade 2 and Grade 3
Northstowe Phase 2	141.4ha	Grade 2 and Grade 3
Land at Bearscroft Farm	33ha	Grade 2 and Grade 3
Alconbury Weald	147ha	Grade 2 and Grade 3a
Darwin Green/NIAB	31.7ha	Grade 2 and Grade 3a
<b>Total</b>	<b>1650.14ha</b>	

- 18.6.25 The draft *National Policy Statement for National Networks* (Department for Transport, 2013) states that:

*“Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land (grades 3b, 4 and 5) in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise impacts, on soil quality taking into account any mitigation measures proposed.”*

*(Department for Transport, 2013, para 5.154).*

- 18.6.26 The same responsibility is placed upon local authorities in paragraph 112 of the *National Planning Policy Framework (NPPF)*.
- 18.6.27 Most agricultural land in southern Cambridgeshire is characterised as being best and most versatile and as a result, any new infrastructure required to link areas of new development is likely to affect best and most versatile agricultural land to some extent. *Chapter 16 of the ES* sets out the proposed measures to minimise the loss of agricultural land as part of the scheme and a soil management strategy would also be implemented to protect the structure of soils removed during construction of the scheme.
- 18.6.28 Although there would be a cumulative effect on agricultural land, it is assessed as being in the same significance category as the effects from the scheme alone (major adverse). This is because the region itself supports a large resource of good quality agricultural land, and despite additional land loss from other future developments, it could not be concluded that the resource would be irretrievably compromised. On this basis a major adverse cumulative effect is predicted, i.e. the effect *may* become a key decision making issue (according to the criteria set out in *Table 18.2*), rather than a severe cumulative effect, which would require the resource to have been irretrievably compromised.

#### *Employment opportunities for construction phase*

- 18.6.29 All of the reasonably foreseeable developments are predicted to generate construction related employment opportunities. This is predicted to have a minor beneficial effect upon the local economy.

#### *Impacts upon community severance (permanent and temporary)*

- 18.6.30 Both the *Huntingdon West Area Action Plan* and *RAF Brampton Urban Design Framework* identify objectives to improve community cohesion and links between new development and the town and village centres. The scheme would also have a slight beneficial effect upon these communities through reduced traffic, which would relieve existing severance. On this basis, additive permanent beneficial effects are predicted upon community cohesion in Huntingdon and Brampton from the scheme in combination with Huntingdon West (for Huntingdon) and RAF Brampton (for Brampton). A moderate beneficial effect is predicted for Brampton and Huntingdon. No other cumulative impacts upon community severance have been identified for the other communities within the study area.

### **Road drainage and water environment**

#### *Increase in flood water levels during operation*

- 18.6.31 None of the reasonably foreseeable developments are predicted result in increased flood waters. Therefore there would not be a significant cumulative effect during construction or operation in this regard.

*Adverse impacts on water quality during construction, during operation (from routine run-off and accidental spillages), and impairment of groundwater quality in the River Terrace Deposits aquifer*

18.6.32 No potential impacts from reasonably foreseeable development have been identified which overlap with the likely significant residual effects of the scheme in terms of water quality during operation or impairment of groundwater quality. Therefore there would not be a significant cumulative effect during construction or operation in this regard.

**Potential multiple impacts upon single locations**

18.6.33 A review of the potential for multiple impacts on specific locations from the scheme itself has been undertaken.

18.6.34 Multiple impacts from the scheme are likely to be noticeable in Huntingdon, which would experience both adverse and beneficial impacts. These impacts would include:

- loss of land at Mill Common and Views Common from the introduction of the scheme's link roads;
- temporary disruption and inconvenience to pedestrians and cyclists during construction;
- introduction of new roads to be crossed by pedestrians and cyclists (hence slight new inconvenience);
- improved landscape and visual amenity of townscape from demolition of A14 viaduct;
- reduction in traffic noise; and
- improvement in air quality in Huntingdon.

18.6.35 The setting of the Huntingdon Conservation Area would be adversely affected by the introduction of the Mill Common and Views Common link roads but also beneficially affected by the demolition of the A14 road viaduct in Huntingdon.

18.6.36 Taking account of the magnitude of impacts predicted upon Huntingdon, it is predicted that, on balance, the beneficial effects would outweigh the negative effects. The interaction of impacts upon air quality, noise, townscape and cultural heritage is likely to result in an improved sense of place within Huntingdon. On this basis, the cumulative effect of disturbance on Huntingdon is likely to be moderate beneficial.

18.6.37 At the western and southern edge of Brampton, residual adverse effects for noise and landscape would be experienced, as well as disruption during construction. Mitigation for these effects is set out in *Chapters 14, 10 and 15 of the ES*, respectively).

## Impact interactions

- 18.6.38 Impact interactions by their nature tend to be indirect and difficult to quantify. The following impact interactions have been predicted:
- Urbanising effect on landscape character from the interaction of visual impacts of new infrastructure, traffic and lighting, traffic noise and loss of some open space.
  - Improved sense of place in Huntingdon from interaction of improved air quality, reduced traffic noise and improved setting of historic buildings.
  - Improved human health and wellbeing from changes to air quality, traffic noise, access to green space, improved facilities for walking and cycling, changes in visual amenity and changes to landscape character.
- 18.6.39 The links between impacts of the scheme and human health are investigated further in *Appendix 18.1* which provides an assessment of impacts on human health. This assessment shows that beneficial effects and improvements are expected in various areas of relevance to health including improved accessibility and connectivity (especially for non-motorised users), increased business opportunities, reduced frequency of road incidents, reduced traffic flows on many local roads and along the existing A14, and improved access for emergency vehicles. Traffic emissions, especially for sensitive locations within the AQMAs, are also predicted to decrease when the scheme is operational.
- 18.6.40 There is the potential for adverse impacts on access to key recreational routes and from noise impacts during construction. However, with mitigation measures implemented, the assessment has not identified any such impacts likely to result in significant adverse health impacts.

## 18.7 Mitigation and potential for enhancement

- 18.7.1 Each of the identified reasonably foreseeable developments, as well as the scheme, include mitigation within their proposals to avoid or reduce adverse effects on the environment. They also include proposals for habitat enhancements.
- 18.7.2 Mitigation to reduce the cumulative effect on landscape character from noise, lighting and visual intrusion could not be identified. Each development includes mitigation proposals to reduce these effects, as agreed through planning. The mitigation proposed for each development's impacts upon these features would reduce the individual project effects but would be unable to fully mitigate for the additive nature of the number of developments within the study area, which would inevitably have an urbanising effect upon landscape character, regardless of mitigation.
- 18.7.3 The cumulative loss of best and most versatile land cannot be mitigated further. However, this type of land is safeguarded through national policies (such as the *NPPF* and *NPS*) and alternatives to development on such land are sought wherever feasible. Each development must therefore be judged on a case by case basis in this regard.

- 18.7.4 The proposals for the improvement of the A14 are already taken account of in the various development plans reviewed as part of this cumulative effects assessment. Therefore, the interaction between this scheme and the development allocations identified within the local development documents are already considered and planned for to some degree, although the timescales of the scheme were considered to be uncertain within some of the development plans.
- 18.7.5 This assessment has not identified a need for additional mitigation further to that already set out in the assessment *Chapters 8 to 17*. The *Code of Construction Practice (CoCP) (Appendix 20.2)* places a requirement upon the contractors to liaise with local authorities when planning the construction activities. This would allow the local authorities to advise on other developments which may be under construction concurrently therefore enabling opportunity to manage the combined effects of construction effectively.

## 18.8 Summary and conclusion

- 18.8.1 This assessment has identified major cumulative effects from the scheme and other reasonably foreseeable development on the following:
- loss of best and most versatile agricultural land;
  - urbanisation of the landscape character through the interaction of noise, lighting and visual intrusion from new infrastructure; and
  - improved provision of routes for active modes of travel (walking and cycling).
- 18.8.2 Moderate cumulative effects have been identified such as:
- adverse effects on the highway network through disruption where the construction of other developments may take place over the same timeframe as the scheme;
  - net beneficial effects upon community for Huntingdon and RAF Brampton as a result of the scheme's effects in combination with proposals under the *Huntingdon West Area Action Plan* and *RAF Brampton Urban Design Framework*; and
  - improved sense of place in Huntingdon from the interaction of air quality, noise, landscape and access improvements from the scheme.
- 18.8.3 Minor cumulative impacts have been identified on the following:
- temporary severance, disturbance to or loss of habitats during construction phases of the scheme and other reasonably foreseeable developments;
  - improved biodiversity as a result of the implementation of habitat enhancement proposals of the scheme and other reasonably foreseeable development; and
  - temporary disruption to public rights of way close to Brampton.

- 18.8.4 A review of the potential for multiple impacts on specific locations from the scheme itself has also been undertaken and has identified that the Mill Common and Views Common areas of Huntingdon in particular would experience a variety of adverse as well as beneficial effects including temporary disruption to pedestrians and cyclists during construction, the introduction of new roads to be crossed by pedestrians and cyclists, and improvements to noise, air quality, visual amenity and cultural heritage features. On balance these would have a moderate beneficial effect on sense of place within the location. At the western and southern edge of Brampton, residual adverse effects for noise and landscape would be experienced, as well as disruption during construction.
- 18.8.5 The various impacts of the scheme in relation to active modes of travel, air quality, noise, access to open space and community cohesion may interact to improve human health and wellbeing. Further detail is provided in *Appendix 18.1* which presents an assessment of impacts on human health.
- 18.8.6 No mitigation over and above that already put forward for the scheme has been identified to further mitigate adverse cumulative effects. Policies in the *NPPF* and *NPS* exist to ensure the protection of resources such as landscape and agricultural land. Policies such as these have set the framework for planning requirements and the design of *Nationally Significant Infrastructure Projects* so that the individual effects are mitigated at project level by the respective developers. The mitigation for the proposed A14 Cambridge to Huntingdon improvement scheme provides for the mitigation of the scheme's likely significant effects as far as practicable, in line with the *NPS*.
- 18.8.7 A summary of the results of this assessment is set out in *Table 18.7*.

**Table 18.7: Summary of cumulative effects and impact interactions**

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
<b>Air quality</b>						
Effects on air quality	No cumulative impacts identified over and above those set out in <i>Chapter 8</i> . Interaction with other impacts in Huntingdon is summarised below under “Effects on Huntingdon”.					
<b>Cultural heritage</b>						
Impacts on historic landscapes	Slight or minor effects upon historic landscape are localised to each reasonably foreseeable development and no geographical overlap is predicted.	Local	Permanent	A programme of historic landscape recording to be followed by sample excavation of affected remains would be carried out for Mill Common and Views Common.	Reasonable	Not significant
Impacts on known archaeological assets	Impacts predicted for developments are geographically localised and isolated.	Local	Permanent		Reasonable	Not significant
Impacts on historic buildings	Positive impacts on the setting of Huntingdon Conservation Area from the scheme but not from other developments so no cumulative impacts identified.	Local	Permanent	None	Reasonable	Not significant
<b>Landscape</b>						
Urbanisation of landscape character	Interaction of new development, traffic noise and lighting is causing a change in landscape character.	District (throughout scheme corridor)	Permanent	Environmental bunds and extensive tree and shrub planting would help mitigate the scheme.	Reasonable	Major adverse

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
<b>Nature conservation</b>						
Biodiversity enhancements through proposals	All reasonably foreseeable developments have incorporated proposals for habitat enhancement to varying degrees.	Local	Permanent	Improvements to connectivity along the scheme and the creation of new habitats along the highways estate in order to achieve net habitat gain along the scheme.	Reasonable	Minor beneficial
Disturbance to breeding birds (grasshopper and Cetti's warblers) and bats during operation	No cumulative impacts identified.					
Severance/disturbance /loss of habitats	All of the reasonably foreseeable developments have identified slight or minor adverse effects upon ecology during construction.	Local	Temporary	See above.	Reasonable	Minor adverse
<b>Geology and soils</b>						
Impacts on Buckden fuel depot, Buckden and/or Milton Landfills	No other developments are predicted to affect these features therefore no cumulative impact is predicted.	Local	Temporary	Appropriate construction practices to reduce mobilisation of contamination. Correct use of appropriate PPE by construction workers.	High	Not significant

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
<b>Materials</b>						
The scheme would have neutral or slight effects on use of primary resources and generation of waste. There is insufficient information on other schemes to quantify the likely additive impact upon material resources from reasonably foreseeable developments in combination with the scheme.						
<b>Noise and vibration</b>						
Effects on noise and vibration	No cumulative impacts identified over and above those set out in <i>Chapter 8</i> .					
<b>Effects on all travellers</b>						
Improved opportunities for active travellers	The majority of the reasonably foreseeable developments provide for travel by non-car modes and most link up with proposals for the NMU route associated with the scheme so that on completion there would be routes between these areas of new residential development and employment sites.	District	Permanent	None	High	Major beneficial
Disruption to public rights of way and non-motorised user routes	Should the construction periods of the scheme and RAF Brampton, cumulative impacts are predicted.	Local	Temporary	Alternative routes and diversions for NMU would be provided when construction activities would impinge upon existing routes.	Moderate	Minor adverse

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
Disruption to highway network during construction	Construction traffic associated with the University site, Darwin Green/NIAB and RAF Brampton could lead to cumulative disruption on the highway network unless carefully managed.	Local	Temporary	Where construction phases overlap, further consideration of construction transport management is recommended in order to minimise disruption.	Moderate	Moderate adverse
<b>Community and private assets</b>						
Loss of agricultural land	There would be an incremental loss of good quality agricultural land across the study area from the scheme and other reasonably foreseeable development.	Regional	Permanent	Minimisation of scheme footprint in the design.	High	Major adverse
Employment opportunities during construction	All reasonably foreseeable developments are predicted to generate construction-related employment.	Local	Temporary	None	High	Minor beneficial
Permanent impacts upon community severance (beneficial and adverse)	Permanent beneficial impacts predicted upon Huntingdon from the objectives of the Huntingdon West Area Action Plan and upon Brampton from the Brampton Urban Design Framework, in combination with the scheme's slight beneficial impact.	Local	Permanent	None	Low	Moderate beneficial

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
<b>Road drainage and the water environment</b>						
Increase in flood levels during operation	No cumulative impacts identified.					
Adverse impacts on water quality during construction.	No cumulative impacts identified.					
Adverse impacts on water quality during operation (from routine run-off and accidental spillages)	No cumulative impacts identified.					
Impairment of groundwater quality in the River Terrace Deposits aquifer	No cumulative impacts identified.					
<b>Effects on Huntingdon</b>						
Removal of A14 viaduct with beneficial effects on noise, air quality, townscape character, amenity of footpaths/cycleways and public open space.	Interaction of impacts leading to a beneficial effect on sense of place in Huntingdon.	Local	Permanent	None	Speculative (sense of place is subjective)	Moderate beneficial

Scheme effect	Cumulative impact or impact interaction	Spatial extent	Permanent or temporary	Mitigation/enhancement	Degree of certainty	Significance of effect
<b>Effects on Brampton</b>						
Operation of Huntingdon Bypass with adverse effects on landscape and noise, as well as disruption during construction.	Interaction of impacts leading to an adverse effect on Brampton.	Local	Temporary during construction and permanent once operational	None	Moderate	Minor adverse

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