19 Summary of the environmental impact assessment

19.1 Introduction

19.1.1 This chapter summarises the findings of the impact assessments reported in this *Environmental Statement (ES)*. Likely significant effects are tabulated in *Table 19.1*. Impact assessments are presented in detail in *Chapters 8* to *Chapter 17.*

19.1.2 To aid in understanding the summary findings, the following sections outline some assessment fundamentals.

19.2 Significance of effects

19.2.1 The significance of environmental effects is largely defined by reference to two key factors:

- the 'value' or 'sensitivity' of the receptor; and
- the 'magnitude' or 'scale' of the impact.

19.2.2 All the environmental assessments are based on the application of published, topic-specific guidance found in the *Design Manual for Roads and Bridges (DMRB)* (Highways Agency et al., 1993), where this is available, or other appropriate guidance. In most cases, effects are defined according to the following broad descriptors:

- adverse or beneficial (i.e. they are undesirable effects, or they represent an improvement over the baseline situation);
- construction or operational (i.e. caused by the construction of the scheme, or by the operation of the scheme after opening);
- short-term or long-term (i.e. they are felt for less than 15 years, or they would still be felt 15 years after construction and beyond); and
- significant or not significant.

19.2.3 *Chapter 6* describes the general approach to the environmental assessment for each topic. For most topics the significance of an effect is described on a five point scale:

- neutral;
- slight;
- moderate;
- large; and
- very large.

19.2.4 In this assessment, for the purposes of the *EIA Directive (2014/52/EU)* (European Union, 2014), an effect is considered to be significant if it is moderate or greater.

19.2.5 Some topics in this assessment have used a different approach to assessing the level of significance in accordance with discipline specific best practice guidance. The specific approach applied to each environmental topic is fully described in the assessment chapters (*Chapters 8 to 17*).

19.2.6 In all cases, the assessment is based on the worst case scenario as described in *Chapter 6* and the individual topic chapters.

19.3 Mitigation

19.3.1 Measures to mitigate the effects of the scheme have been identified and included as scheme features or commitments (*Chapter 20 and Appendix 20.1*). These mitigation measures have been taken into account in the assessment of residual effects for each topic.

19.4 Residual effects

19.4.1 Following implementation of mitigation, the environmental effects envisaged to remain are referred to as residual effects. These are described in each topic chapter.

19.4.2 Some design features and mitigation measures may result in an environmental improvement. In these instances, the residual effect is recorded as 'beneficial'.

19.5 Summary of environmental effects

19.5.1 *Table 19.1* summarises the likely significant effects, i.e. residual effects with a significance of moderate or greater. The required mitigation measures are also outlined.

19.6 Transboundary effects

19.6.1 Regulation 24 of the *Infrastructure Planning (Environmental Impact Assessment) Regulations 2009* requires the consideration of any likely significant effects on the environment of another European Economic Association (EEA) State.

19.6.2 Guidance on the consideration of transboundary effects is provided in Planning Inspectorate's Advice Note Twelve: Development with significant *transboundary impacts consultation, version 3 (*April, *2012).*

19.6.3 The transboundary screening effects matrix is provided in *Appendix 19.1.* This confirms that the only transboundary effect relates to increases in greenhouse gases.

Table 19.1: Summary of significant residual environmental effects

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Chapter 8: Air quality– none to report					
Chapter 9: Cultural heritage					
Effects on historic buildings[1] Beneficial impacts would result from the reduction of traffic levels and noise intrusion from de-trunking of the existing A14 on three conservation areas and Huntingdon Bridge. The removal of the existing A14 viaduct would have beneficial effects on the character of Huntingdon Conservation Area and Huntingdon Train Station. Adverse impacts would result from the presence of new road infrastructure on Mill Common in the landscape, and visual and noise intrusion resulting from its operation on Huntingdon Conservation Area. Three buildings would experience beneficial adverse impacts as a result of the scheme through decrease in traffic noise. The same three buildings would	Beneficial Beneficial Adverse Beneficial Adverse	O O O O O	L L L L L	Effects on historic buildings would be mitigated by historic building recording, and hard and soft landscaping.	Very large beneficial • Huntingdon Train Station. Large beneficial • Huntingdon Bridge Moderate beneficial • Godmanchester Post Street Conservation Area • Godmanchester Earning Street Conservation Area Moderate adverse and large beneficial • Huntingdon Conservation Area Moderate adverse and slight beneficial • 2 The Walks North, Huntingdon • 3-4 The Walks North, Huntingdon • 5-6 The Walks North,

[1] *DMRB* notes there is no requirement to produce a single overall score. Where there are adverse and beneficial effects these will need to be brought out in the assessment, and not obscured by balancing them off against one another.

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
experience adverse impacts as a result of the scheme through loss of setting.					Huntingdon
Chapter 10: Landscape					
Landscape designations There are a number of mature trees with tree preservation order (TPO) status within the scheme area.	Adverse	C/O	L	The outline design has been adjusted to retain TPO trees where practicable and further mitigation would be incorporated at the detail design stage. However, it is not possible to fully mitigate the removal of TPO trees.	Large adverse
Landscape character The introduction and expansion of major highway infrastructure would affect the character of the existing landscape and there would be some localised loss of privately owned green space within Huntingdon. The removal of the existing A14 viaduct in Huntingdon would benefit the townscape and some views, such as from users of public rights of way and people accessing Huntingdon railway station. The proposed borrow pit areas would change land use and landscape character.	Adverse	C/O	L	Mitigation measures are proposed to lessen the landscape impacts. Environmental bunds and extensive proposed tree and shrub planting would help to integrate the scheme and the borrow pits into the wider landscape.	Residual effects - summer year 15: • North Flowing Ouse Valley Floodplain • Huntingdon: Eastern Part of Mill Common Large adverse
	Adverse	C/O	L		• Huntingdon: Hinchingbrooke and Central Part of Views Common Moderate adverse
	Beneficial	C/O	L		• Huntingdon: Station Environs Large beneficial

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Visual impact There would be views of major highway infrastructure and junctions, associated gantries, noise barriers and environmental bunds, signage and lighting, and extensive borrow pit areas from surrounding housing, businesses, public rights of way and public areas. Removal of existing vegetation would open up views towards the scheme and increase the prominence of highway infrastructure within the landscape. Reduction in traffic in some areas would benefit the landscape character as well as views from within the area.	Adverse / beneficial	C/O	L	Mitigation measures are proposed to lessen the visual impacts. Environmental bunds and extensive proposed tree and shrub planting would help screen the highway and traffic flow.	Residual effects - summer year 15: <u>Residential properties:</u> • large adverse – 29 • moderate adverse – 48 • moderate beneficial – 137 • large beneficial -96 <u>Public rights of way:</u> • very large adverse – 1 • large adverse – 7 • moderate adverse – 17 • moderate beneficial – 1 • large beneficial - 3 • very large beneficial – 1 <u>Commercial properties:</u> • moderate adverse – 1 • moderate beneficial – 1 <u>Public receptors:</u> • large adverse – 1 • moderate adverse – 4 • very large beneficial – 1
Chapter 11: Nature conservation					
Disturbance to breeding birds during operation via visual stimulus and traffic noise, specifically those birds of county value associated with Buckden	Adverse	O	L	Lighting along the road would be avoided where practicable. Lighting would be designed with sharp cut off horizontally	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Gravel Pits.				mounted units. Balancing ponds and landscape planting would comprise habitats that are suitable for breeding birds to offset any reduction in breeding densities or productivity which may arise due to noise disturbance from the scheme.	
Loss of foraging habitats for bats during construction. Due to the time lag between clearance of habitats to enable construction and planting and maturation of new habitats there would be a short term impact from loss of foraging habitat on bats.	Adverse	C	T	Review engineering design and vegetation lost at detail design stage. Where appropriate undertake tree surgery in preference to tree felling, e.g. crown reductions, pollarding, coppicing, so as to retain habitat resource, as per *CoCP Appendix 20.2.* Translocate living vegetation where appropriate and of high value.	Moderate adverse
Disturbance to roosting bats during operation.	Adverse	O	L	Provision of bat boxes in areas of suitable habitat along the length of the scheme, in retained habitat furthest from the road. Provision of new planting in areas furthest from the road to provide alternative roost sites and foraging habitat once planting has matured.	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
				Replacement habitats would be planted at the earliest opportunity prior to, during and after construction.	
Mortality to bats during operation.	Adverse	O	L	Provision of lengths of tall and dense vegetation planting alongside the carriageway to elevate the flight path of bats over the height of heavy goods vehicles. Sensitive design of new and extended culverts to maximise the diameter of these structures, providing safe routes under the road. Provision of planting to guide bats to safe crossing points (hop-overs and culverts).	Moderate adverse
Habitat gain for bats during operation.	Beneficial	O	L	Construction of the scheme would result in a significant amount of new semi-natural habitat (271ha) which would be beneficial to bats.	Moderate beneficial
Chapter 12: Geology and soils – none to report					
Chapter 13: Materials					
The impact would involve the use of high volumes of primary aggregate resources won on-site. Potential impacts associated with land-use,	Adverse	C	L	On-site materials would be reused wherever practicable subject to appropriate testing for suitability for the proposed	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
ecology, water resources and dust associated with on-site excavation and storage of borrow pit materials are covered under *Chapters 8, 12, 14, 17 and Appendix 3.2.*				end use.	
The impact would involve the use of high volumes of materials that would need to be imported.	Adverse	C	L	Methods to reduce the use of and impacts of importing primary materials would be considered throughout the development of the scheme. This would include reuse of on-site materials and use of secondary/recycled materials locally and responsibly sourced. Where importation of materials is required, the methods of this would be explored with the contractor which would include exploring the use of railheads. Transport routes for road haulage would be identified and discussed with the highways authority. Incorporate the use of recycled content in new materials to at least 25%.	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
The impact of the scheme upon carbon emissions are an inevitable result of the use of materials and energy expended in construction.	Adverse	C	T/L	Materials to be re-used and recycled, as far as practicable. Exploration of the use of railheads for transport, and routes for road haulage would be identified and discussed with the highways authority.	Construction phase: 981,432 tonnes of CO_2e (tCO_2 e)
Chapter 14: Noise and vibration					
Construction noise impact upon sensitive receptors.	Adverse	C	T	The method of controlling construction noise and vibration on site is defined in the Code of Construction Practice (CoCP) (*Appendix 20.2*). Principally, that the works will shall be undertaken in a manner which demonstrates that best practicable means (as defined in Control Of Pollution Act 1974) is adopted at all times to minimise construction noise and vibration. Furthermore, the CoCP (*Appendix 20.2*) identifies off-site mitigation which would ensure that a significant adverse effect is not identified at any individual dwelling.	A significant residual construction noise effect is identified at 7 communities, on a temporary basis: • south west corner of RAF Brampton • six dwellings on A14 between Bar Hill and Girton. • approx. 25 dwellings on Girton Road and Wellbrook Court, Girton • approx. 25 dwellings on Lone Tree Ave and Cambridge Road, Impington • approx. 250 dwellings on Chieftan Way, Cambridge • approx. 90 dwellings to north east of Kings

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
					Hedges and open park/playground on Topper St approx. 30 dwellings on St George St, Huntingdon
Noise impact during scheme operation.	Beneficial	O	L	Base scheme mitigation with acoustic barriers where required.	During operation, over 2,900 dwellings along existing A14 corridor through Huntingdon, Godmanchester and Fenstanton and many sensitive non-residential facilities, including Hinchingbrooke Hospital, Stukeley Meadow Primary School and Hemingford Nursery School would benefit from noise reductions as a result of scheme. These include several Important Areas identified in action plans published under the Government's environmental noise regulations. There would be around 330 dwellings with a minor adverse or greater noise impact predominantly along new bypass section of the scheme between Brampton

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
					interchange and Fen Drayton. A small number of residential properties situated close to scheme would qualify for noise insulation under the Government's regulations. Noise insulation combined with mitigation integrated into the scheme would avoid any significant adverse impact on health and quality of life, consistent with Government noise policy.
Chapter 15: Effects on all travellers					
Substantial disruption to bridleways Madingley 2 and Girton 6 during construction.	Adverse	C	T	The Construction Code of Practice would require contractors to provide effective measures to minimise disruption and the public.	Large adverse
Loss of amenity and temporary disruption to NMU on public rights of way and permissive paths at Views Common, Mill Common and Hinchingbrooke Park Road in Huntingdon during construction, and particularly cyclists at Histon junction during construction.	Adverse	C	T	The Code of Construction Practice would require contractors to provide effective measures to manage disruption, and maintain public access as far as is practicable.	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Substantial loss of amenity to footpaths Brampton 2 and 15 and bridleway Brampton 19, during construction due to large scale earthworks and length of construction programme at this location. Loss of amenity to footpaths Brampton 3 and 4, Fenstanton 6 during construction as very close to borrow pits and soil storage areas. Loss of amenity and physical disruption to footpaths Fenstanton 6 and 7, Conington 1 and bridleway Dry Drayton 12 during construction. Substantial construction activities associated with the Swavesey and Bar Hill junctions would cause inconvenience and loss of amenity to NMU crossing at these locations.					

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Loss of amenity (rural character) for public rights of way from Silver Street and proposed New Barns Lane bridge. (Pathfinder long distance walk, Godmanchester 1, Offords 2 and 7, Hemingford Abbot 10 and 9, Hemingford Grey 10 and 13, and Mere Way).	Adverse	C/O	L	Sensitive landscaping proposals would help to integrate the new road with the landscape as much as possible and mitigate some of the noise and visual intrusion. Connectivity of public rights of way north and south of the new road would be maintained through the provision of shared use paths over the new bridges.	Moderate adverse
The linking of bridleway Brampton 19 with the proposed new bridleway and crossing of the A1 would allow people to safely cross the A1 and access open space to the west and Brampton Hut service area and the area of new wetland created from borrow pits.	Beneficial	O	L	None. Sensitive borrow pit restoration would improve the diversity of landscape features and access to Brampton Wood and Grafham Water would be improved with the new bridleway provision.	Large beneficial
Improved links and function of bridleways Swavesey 14 and 15 (Scotland Drove and Utton Drove) and footpaths Lolworth 5 and 6, bridleway Lolworth 10, Robin's Lane, Cambridge Road, New Barns Road, bridleway Dry Drayton 12, Conington 2, Fen Drayton 3, and footpaths Girton 7 and 8.	Beneficial	O	L	None. These public rights of way would link into the proposed new NMU route between Fenstanton and Girton. They currently terminate at the A14 from where there is no further access except on the A14 trunk road itself.	Large beneficial

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Improved connectivity for NMU along A14 corridor between Swavesey and Girton.	Beneficial	O	L	None. The design includes provision of NMU bridges at Swavesey junction and Bar Hill junction which link to the proposed new NMU route and areas of residential and employment land use. Also there would be an NMU path and crossing facilities at the modified Dry Drayton junction bridge. These new facilities allow NMU to travel parallel to the A14 and to cross the A14 where previously there was not suitable provision.	Large beneficial
Improved conditions for on-road cycling between Ellington junction and Woolley Road. The construction of a local access road between new Ellington junction and Woolley Road would provide a direct route with less traffic, providing cyclists with a new opportunity.	Beneficial	O	L	None. The design mitigates for the current lack of opportunity to reach Woolley Road except via the A1 trunk road which has hazardous conditions for cyclists.	Moderate beneficial
The linking of footpaths Brampton 15 and Brampton 28 with the proposed new bridleway and crossing of the A1 would allow people to safely cross the A1 and access open space to the west and Brampton Hut service area.	Beneficial	O	L	None. The design provides new opportunities by linking existing public rights of way with proposed new non-motorised user (NMU) provision.	Moderate beneficial

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Improved conditions for cyclists to use byways Brampton 1/Buckden 11.	Beneficial	O	L	None. The proposals to improve these byways may be beneficial for cyclists and improve connectivity between National Cycle Route (NCN) 12 and Buckden.	Minor beneficial
Improved convenience for NMU on Buckden Road (B1514).	Beneficial	O	L	None. The design includes a new NMU route alongside the road to a point where it meets existing provision.	Moderate beneficial
Improved provision on Potton Road (B1040) to link existing public rights of way (Hemingford Grey 10 and 14 and Conington 7).	Beneficial	O	L	A new shared use NMU path would be provided across the new Potton Road bridge (B1040) which would provide new links to existing public rights of way where there is currently no segregation between NMU and traffic on the B1040.	Moderate beneficial
Improved connectivity of Washpit Road to wider proposed NMU network.	Beneficial	O	L	None. The design links Washpit Road to new NMU path, where currently it meets A14 with limited connectivity to other routes.	Moderate beneficial

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Improved amenity of footpaths across Views Common in Huntingdon.	Beneficial	O	L	None. The demolition of the A14 viaduct would remove a visually domineering structure and reduce traffic noise to open up and improve the overall amenity of the area for NMU.	Moderate beneficial
New roads to be crossed for NMU on Brampton Road (NCN 12 and 51) and Hinchingbrooke Park Road.	Adverse	O	L	The design includes crossing facilities (pelican crossings) and signalised junctions to provide opportunities for NMU to cross and to reduce journey delay for NMU.	Moderate adverse
Increased driver stress on the A1 trunk road from Brampton Hut junction to Brampton junction.	Adverse	O	L	The design would have improved highway standards which may help to reduce some contributors to driver stress such as frustration, route uncertainty and fear of accidents.	Significant adverse
Reduced driver stress on the A14 trunk road between Godmanchester and Trinity Foot/Swavesey junction	Beneficial	O	L	Provision of Huntingdon Southern Bypass results in likely levels of driver stress to be reduced from high to low.	Significant beneficial

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Relocation of existing bus stops on A14 trunk road between Trinity Foot and Girton to proposed local access road.	Beneficial	O	L	None. Bus travellers currently have to take long diversions on foot across junction bridges with no NMU provision or to cross A14 carriageway directly to cross between east-bound and west-bound services. The scheme relocates bus stops onto local access road where they would be reached via the new NMU facility and be accessible by wheelchair and other pedestrians currently unable to access them.	Significant beneficial
Chapter 16: Community and private assets					
Overall approximately 1,000ha of agricultural land classified as 'best and most versatile' would be lost as a result of the scheme.	Adverse	C/O	L	Mitigation is through avoidance during scheme detailed design where practicable, and the careful storage and re-use of top soil.	Major adverse
Numerous (approximately 30) farms would be significantly impacted by loss of land, severance and access changes.	Adverse	C/O	L	Mitigation to involve the maintenance of access routes throughout scheme construction and operation phases as set out in the Code of construction practice.	Moderate adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Overall the scheme wide effects on community facilities and private property are expected not to be significant, but on an individual basis, a number will be significantly adversely impacted as follows: Cambridge Services, Cambridgeshire Constabulary HQ and Trinity College Wood, due to land take; three residential buildings due to demolition; and a few businesses due to land take and change in traffic patterns.	Adverse	C/O	L/T	Maintain essential access for private residences, community facilities and businesses throughout the construction period. General approach in *CoCP Appendix 20.2.* Ongoing consultation of design to ensure appropriate provision for replacement access where required.	Moderate Adverse
Development land primarily to be impacted by changes in access which may affect the viability of the development proposals. The effect on development is likely to be beneficial overall as the scheme would improve access to as yet unbuilt planning allocations.	Beneficial	O	L	Improved access included as part of scheme design.	Beneficial
Overall the effects of the scheme on community severance are not thought to be significant, but at the individual community level Boxworth is expected to have moderate adverse effects due to the proximity of borrow pit 5.	Adverse	C	T	Construction effects are managed through the *CoCP Appendix 20.2.*	Moderate Adverse

Description of effect	Adverse/ beneficial	Construction / operational	Long term/ temporary	Mitigation requirements	Significance of residual effect after mitigation
Socio-economic impacts from the scheme in terms of the impact employment in the region to result in approximately 800 to 1,600 additional jobs to the local region.	Beneficial	C	T	The regional economy would benefit from the creation of additional direct and indirect jobs to the local region during construction of the scheme.	Beneficial
Chapter 17: Road drainage and the water environment					
Flood risk and drainage					
Increase in flood water levels	Adverse	O	L	Flood plain compensation. Further consultation is being undertaken with the Environment Agency on Ellington Brook, Brampton Brook and the river Great Ouse.	Slight adverse
Surface water – hydromorphology – none to report					
Surface water quality – none to report					
Groundwater – none to report					

Adverse or beneficial **Construction (C) or operational (O)** **Long term (L) or temporary (T)**

19.7 Bibliography

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