



Chapter 16

EFFECT INTERACTIONS

16 Effect Interactions

16.1 Introduction

- 16.1.1 This chapter assesses the interaction of individual effects of the Development upon identified receptors / resources from multiple technical topics in the EIA (known as 'intra-project' effects). This chapter forms part of the cumulative assessment provided within this ES.
- 16.1.2 Details on the assessment approach for inter-project effects of the Development with other cumulative schemes are provided in Chapter 3: EIA Methodology. The inter-project cumulative assessments are provided in each technical chapter of this ES (Chapters 7–15).

16.2 Methodology

- 16.2.1 There is no consistent guidance or standardised approach to the assessment of effect interactions. No single approach to cumulative impact assessment can satisfy the unique circumstances faced by all projects. Cumulative impact assessments should be 'fit for purpose' and avoid overly prescriptive processes, allowing for a degree of professional judgement to be applied.
- 16.2.2 It is recognised that the Development has the potential to give rise to a variety of impacts upon a number of different receptors, some of which have the potential to combine to become significant effects.
- 16.2.3 Table 16.1 summarises the receptor-based effect interactions assessment process used for both construction and operation of the Development.

Table 16.1: Effect Interactions Assessment Process

Step	Description
Step 1: Identify and categorise receptors	Identify all topic sensitive receptors and their geographical locations based on the study areas and study areas of the respective technical assessments. These will then be categorised by type.
Step 2: Identify impacts	Identify all topic impacts associated with sensitive receptor(s)/ receptor types.
Step 3: Screen receptors and associated impacts	Undertake a screening exercise upon the identified receptors and impacts. Screened items out from further assessment if they are: <ul style="list-style-type: none"> ▪ Receptors where no topic impacts overlap; ▪ Receptors with no temporal overlap with topic impacts; or ▪ Receptors where topic impacts are identified as 'negligible'.
Step 4: Assess effect interactions	Qualitative assessment based on professional judgement of the effect interactions.

- 16.2.4 The intra-project effects assessment uses professional judgement and takes a qualitative assessment approach. Assessing the significance of effects interaction requires subjective judgement about how well a receptor is able to accommodate the multiple changes that will occur as a result of the Development.
- 16.2.5 Assessments of socio-economics, transport and access, air quality, noise and vibration, cultural heritage, biodiversity, landscape and visual effects, climate change and greenhouse gases and water, flood risk and drainage have been carried out in this EIA.
- 16.2.6 The study area, or Zone of Influence (ZOI), for the in-combination effects assessment was defined by the study areas of these environmental topic assessments, which are discussed in the relevant topic chapters, and summarised in Chapter 3: EIA Methodology.
- 16.2.7 Steps 1 and 2 were undertaken within each technical assessment (Chapters 7-15) as part of the assessment of effects process. Steps 3 and 4 were undertaken by the EIA co-ordinators, Quod, for both the construction and completed development phases.
- 16.2.8 During the screening exercise, a spatial overlap was identified when the same receptor was identified in more than one technical chapter. These effects were then checked for a temporal overlap. If both a spatial and temporal overlap were identified, and the associated topic effects were above negligible, then the intra-project effects on that receptor / receptor group were taken forward for assessment (Step 4).
- 16.2.9 The assessment of transport, air quality, noise and vibration, and landscape and visual effects all concern ground level human receptors, namely the occupants of properties in proximity to the Site, the users of the road network, drivers, pedestrians and cyclists on the surrounding road network and users of the surrounding Public Rights of Way (PRoW). Human receptors are principally considered in relation to their health and wellbeing.
- 16.2.10 Human receptors have the potential to experience an interaction between transport, air quality, noise and vibration, and landscape and visual effects if there is a spatial and temporal overlap of effects acting on these receptors. There is also an indirect effect of socio-economics and climate change which is conducted at a greater spatial scale.
- 16.2.11 The potential cultural heritage effects only impact on buried archaeological assets and built heritage assets, imposing no effects on people. Therefore, cultural heritage effects are scoped out of further consideration in this chapter as there is no potential for effect interactions with other topics. Visual effects on setting of heritage assets has inherently been considered in the assessment provided in Chapter 11: Cultural Heritage.
- 16.2.12 Water resources and air quality are fundamentally linked to biodiversity receptors. However, these aspects are inherently considered in Chapter 12: Biodiversity as applicable, and are not assessed herein as an effect interaction.

16.3 Baseline

- 16.3.1 The baseline for the effect interactions assessment for this EIA is as described in each technical chapter affecting:

- Drivers, pedestrians and cyclists on the surrounding road network, PRow and occupants of existing properties on the surrounding road network during the Enabling Works and construction phase; and
- Drivers, pedestrians and cyclists on the surrounding road network, PRow and occupants of properties on the surrounding road network during the completed Development phase.

16.4 Assessment of Effects

Enabling Work and Construction effects

16.4.1 No residual effects with a minor significance or greater were identified in the transport and access, air quality and noise and vibration assessments. Only the landscape and visual assessment identifies residual effects up to moderate adverse significance on residents of nearby conurbations and users of the local road and public right of way (PRow) network. As such, no effect interactions are predicted for the Enabling Works or construction phase of the Development.

Completed Development effects

16.4.2 Effects of minor significance or greater were identified for drivers, pedestrians and cyclists on the surrounding road network and occupants of existing properties in proximity to the Site. Therefore, there is potential to experience an effect interaction between transport, noise, air quality and landscape and visual effects. Beneficial effects on the local and district economy were also identified within the Socio-economics assessment. Table 16.3 provides an assessment of these potential effect interactions.

Table 16.3: Potential Effect Interactions – Completed Development

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
Drivers, pedestrians and cyclists on the surrounding road network; and occupants of properties in proximity to the Site.	Chapter 8: Transport and Access	Moderate beneficial effects on driver delay on the B4100; up to minor adverse effects on severance, pedestrian and cyclist delay & amenity, fear and intimidation; and minor beneficial effects on accidents and safety.	Up to minor adverse – local road users, notably the B4100, A43/B4100 junction and M40 Junction 10, would experience a range of adverse effects on the local road network due to an increase in traffic. On the B4100 east of the Site, there would also be a localised minor adverse change in views. This receptor group may also experience indirect effects of GHG emissions associated
	Chapter 9: Air Quality	Significant effect on human health at one receptor location on the kerbside of the M40.	

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
	Chapter 10: Noise and Vibration	Significant effect for one residential receptor located south of the A421 for the night-time period; Not Significant at all other receptors.	with the traffic associated with the operation of the Development (cumulated with national and global emissions), e.g. the disruption of extreme weather events (flooding and heatwaves), effecting the usability of roads and pavements. Overall, different local road users will experience a range of possible effect interactions depending on their mode and direction of travel.
	Chapter 13: Landscape and Visual Impacts	Minor adverse visual effects on users of the B4100 east of the Development from introduction of new built form (large commercial buildings) into the landscape and loss of openness.	
	Chapter 14: Climate Change and Greenhouse Gases	GHG emissions from operations: Potential significant adverse (scale not defined)	
Potential employees (Bicester and Cherwell District)	Chapter 7: Socio-economics	Moderate beneficial employment effects (Bicester and Cherwell District)	Up to minor adverse – potential future employees would experience a beneficial change through creation of a source of new employment. This receptor group would also experience a range of adverse effects on the local road network due to an increase in traffic and localised minor adverse impacts on views when commuting on the B4100 east of the Site. This receptor may also experience the indirect effects of GHG emissions associated with the traffic associated with the operation of the Development
	Chapter 8: Transport and Access	Moderate beneficial effects on driver delay; up to minor adverse effects on severance, pedestrian and cyclist delay & amenity, fear and intimidation; and minor beneficial effects on accidents and safety.	
	Chapter 10: Noise and Vibration	Significant road traffic noise effects on residential dwellings near the Site and on the B4100 north of Bicester.	

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
	Chapter 13: Landscape and Visual Impacts	Up to moderate adverse effects from introduction of new built form (large commercial buildings) into the landscape and loss of openness.	(cumulated with national and global emissions), e.g. the disruption of extreme weather events (flooding and heatwaves). Should these employees live within the identified noise sensitive receptors [illustrated in Figures 10.3 and 10.4 in Chapter 10: Noise and Vibration], they may also be subject to adverse road traffic noise associated with the operational Development.
	Chapter 14: Climate Change and Greenhouse Gases	GHG emissions from operations: Potential significant adverse (scale not defined)	