A38 Derby Junctions
TR010022
Volume 6
6.1 Environmental Statement
Chapter 15 – Assessment of Cumulative Effects

Regulation 5(2)(a)

Planning Act 2008

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

April 2019

Infrastructure Planning

Planning Act 2008

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

A38 Derby Junctions Development Consent Order 202[ ]

6.1 Environmental Statement
Chapter 15 Assessment of Cumulative Effects

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15. Assessment of Cumulative Effects

15.1 Introduction and competent expert evidence

15.1.1 This chapter presents the results of an assessment of the likely significant cumulative effects of the Scheme.

15.1.2 This chapter is supported by the following appendices (Environmental Statement (ES) Volume 3) [**TR010022/APP/6.3**]:

- Appendix 15.1: Cumulative effects: screening methodology.
- Appendix 15.2: Long list of developments.
- Appendix 15.3: Shortlist of cumulative developments.
- Appendix 15.4: Cumulative effects assessment.

15.1.3 All figures cited within this chapter are included within ES Volume 2 [**TR010022/APP/6.2**].

15.1.4 The technical lead for the cumulative effects assessment reported in this ES is a full member of IEMA, a Chartered Environmentalist (CEnv) and an IEMA Principal EIA Practitioner. Details of the technical lead for the cumulative assessment, and their professional qualifications and experience are summarised in Appendix 1.1 [**TR010022/APP/6.3**].

15.2 Legislative and policy framework

15.2.1 Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (SI No. 572) states that the EIA should include consideration of both the interaction between the different aspects of the environment likely to be affected by the development (Regulation 5 (2)(e)), and the likely significant effects of the development resulting from the cumulation of effects with other existing or approved projects (Schedule 4, Paragraph 5(e)).

15.2.2 As discussed in Chapter 1: Introduction, the primary basis for deciding whether or not to grant a Development Consent Order (DCO) is the National Policy Statement for National Networks (NPSNN) (Department for Transport (DfT), 2014). NPSNN Sections 4 and 5 set out policies to guide how DCO applications will be decided and how the impacts of national networks infrastructure should be considered. Section 4.16 of the NPSNN states that: "*when considering significant cumulative effects, any environmental statement 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).*"

15.3 Cumulative assessment methodology

Scope of the assessment

15.3.1 The EIA Scoping Report (Highways England, 2018) defined the matters to be covered by the cumulative effects assessment.

15.3.2 The Inspectorate's Scoping Opinion (The Planning Inspectorate) (refer to Appendix 4.1 [**TR010022/APP/6.3**]) requested the following:

"Study areas are not defined but are proposed to be based on a zone of influence defined by the environmental topic specialists. The ES should include justification for the zone of influence adopted, which should be consistent with the study area for each aspect in isolation".

15.3.3 Details of the zones of influence (ZoI) and associated study areas for the cumulative effects assessment are detailed in Section 15.6 and in more detail within Appendix 15.1 [**TR010022/APP/6.3**].

15.3.4 It is noted that at the time of EIA Scoping Report submission, it was proposed that health effects would be considered within the cumulative assessment. However, health effects have been covered in Chapter 12: People and Communities. As such, the Scoping Opinion comments regarding the human health study area and significance criteria are covered in Chapter 12: People and Communities and thus are not repeated here.

15.3.5 Based on the outcomes of the scoping process, the cumulative effects assessment considers two forms of impact:

- **Combined impacts:** combinations of impacts that have been identified in Chapters 5 to 13, which, when acting together, are considered likely to result in a new or different likely significant effect, or an effect of greater significance, than any one of the impacts on their own.
- **Cumulative impacts:** Scheme impacts which, when considered together with the impacts associated with other planned developments, could result in a new or different likely significant effect or an effect of greater significance than the Scheme in isolation.

Assessment guidance

15.3.6 In conjunction with professional judgement, the following guidance has been used to inform the scope and content of the combined and cumulative effects assessments, and to assist the identification and mitigation of likely significant effects:

- Guidance contained within Volume 11, Section 2 Part 5: Assessment and Management of Environmental Effects (HA205/08) of the Design Manual for Roads and Bridges (DMRB) (Highways Agency, 2008) has been used to inform the development of the significance criteria applied within the assessment of combined and cumulative effects.

- Guidance contained within Advice Note seventeen (The Planning Inspectorate, 2015) relating to the staged identification and assessment of developments has been applied within the assessment of cumulative effects.

15.3.7 This builds upon and is consistent with the overarching EIA methodology and guidance presented in Chapter 4: Environmental Impact Assessment Methodology.

Combined effects methodology

15.3.8 The assessment of combined effects has considered whether an individual receptor or resource would likely be affected by more than one type of impact as a result of the Scheme. For example, a residential occupant could be exposed to noise, air quality and visual impacts at the same time as a result of earth moving activities during the Scheme construction phase.

15.3.9 The assessment methodology has involved the identification of impact interactions associated with the Scheme upon separate environmental resources and receptors, in order to understand the overall combined environmental effect of the Scheme.

15.3.10 Potential interactions were identified by reviewing the impacts identified within Chapters 5 to 13, in order to establish where individual impacts would potentially combine and result in likely significant effects.

15.3.11 The significance of combined effects upon environmental resources and receptors was determined using professional judgement, with input provided by the competent experts responsible for the production of the individual assessments reported within Chapters 5 to 13.

Cumulative effects methodology

15.3.12 The assessment of cumulative effects has considered the effects on environmental resources and receptors that would likely occur from the incremental changes arising from the Scheme in conjunction with other planned developments.

15.3.13 The assessment of cumulative effects has been guided by the following considerations:

- Understanding the temporal and spatial limits of the effects associated with the Scheme and those associated with other planned developments.
- The sensitivity, value or importance of environmental resources or receptors, and their susceptibility to effects.
- Whether different types of effect would occur and interact in a way that alters their significance.
- Whether effects would be temporary or permanent in duration, what their timescales would be, and whether the frequency of such effects would be intermittent or constant.

- What mitigation measures are being applied by the development proposals.
- Whether effects would require any additional mitigation measures, in order to reduce their significance.
- The degree of certainty and confidence relating to the effects.

15.3.14 In accordance with the guidance set out within Advice Note seventeen (The Planning Inspectorate, 2015), the following tasks were undertaken as part of the cumulative assessment, details of which are presented in Appendix 15.1 [**TR010022/APP/6.3**].

Stage 1

15.3.15 This stage involved establishing the Scheme's ZoI for the various technical topics considered as part of the EIA and reported within this ES, and the identification of a long list of planned developments and development allocations within the combined ZoI.

15.3.16 Each development within the long list was assigned a status (or tier), informed by feedback from the applicable local or national authority and information available on their planning portals, which indicated the level of certainty and an indication of the likely level of detail available. Tier 1 developments are considered to be the most certain of progressing, whilst Tier 3 developments are the least certain (refer to the details provided in Appendix 15.1 [**TR010022/APP/6.3**]).

15.3.17 The long list of developments is presented in Appendix 15.2 [**TR010022/APP/6.3**] and comprises a total of 50 developments, the locations of which are illustrated in Figure 15.1 [**TR010022/APP/6.2**].

Stage 2

15.3.18 This stage involved reviewing the long list of planned developments in the vicinity of the Scheme, in order to identify those developments to be taken forward into the cumulative assessment.

15.3.19 The developments on the long list were reviewed in order to identify whether their temporal and/or spatial interactions with the Scheme could result in potential cumulative effects. Those developments where the potential for cumulative effects was identified were placed on the shortlist.

15.3.20 The shortlist of developments is presented in Appendix 15.3 [**TR010022/APP/6.3**] and comprises a total of 10 developments, the locations of which are illustrated in Figure 15.2 [**TR010022/APP/6.2**].

Stage 3

15.3.21 This stage involved sourcing further information relating to the shortlisted developments, in order to establish the details of their likely environmental effects.

Stage 4

15.3.22 This stage involved identifying where cumulative effects are likely to occur, and assessing the potential significance of these effects on environmental resources and receptors that would be affected by the Scheme. The results of the assessment are provided in Section 15.10.

Traffic related effects

15.3.23 A traffic model covering the locality associated with the strategic and local road network has been developed to forecast future traffic flows, both with and without the Scheme (refer to the Transport Assessment Report [**TR010022/APP/7.3**]).

15.3.24 Chapter 4: Environmental Impact Assessment Methodology summarises the approach undertaken as part of the traffic modelling process to:

- Predict the amount of traffic growth likely to occur in the future, in the absence of the Scheme.
- Account for the influence that other development projects in the region (classified as being “near certain” or “more than likely” to be implemented) would have on future traffic flows.
- Predict the changes that the operation of the Scheme would have on future traffic flows.

15.3.25 Full details of the other development projects included within the traffic model (covering developments in Amber Valley, Derby City, Erewash, North West Leicestershire and South Derbyshire), and the factors applied during the modelling process, are presented within the Transport Assessment Report [**TR010022/APP/7.3**]. These developments include a number of minor highway junction alterations, as well as local authority and Highways England schemes (including changes to junction 24 of the M1, the A50 A453 link road, Kegworth Bypass, the T12 link Road, the South Derby Link Road). Construction of these road improvement schemes have been scoped out of the cumulative effects assessment on the basis that they are minor changes that would not result in likely significant effects, or the projects are located well outside of the defined 2km study area.

15.3.26 The following assessments have relied wholly, or in part, on the forecasts derived from the traffic model for the Do Minimum scenario (representative of the conditions that would exist at a given point in the future without the Scheme in place, but accounting for other development projects) and the Do Something scenario (as above, but with the Scheme in place):

- Air quality (see Chapter 5).
- Noise and vibration (see Chapter 9).
- People and communities (as part of the calculations of driver stress and traffic related severance) (see Chapter 12).

- Road drainage and the water environment (as part of the calculations for road runoff and accidental spillages) (see Chapter 13).

15.3.27 As the influence of other development projects already forms an inherent part of the traffic forecasts upon which the assessments of the Scheme's effects within these topics have been based, by default cumulative effects are included and reported within their operational assessments. Thus the operational effects as reported within Chapter 5: Air Quality and Chapter 9: Noise and Vibration are effectively cumulative impact assessments in that they take account of all potential traffic generated by future development proposals. This also applies to the conclusions drawn where other topics have relied on the results of these assessments, for example biodiversity (see Chapter 8: Biodiversity).

Significance criteria

15.3.28 The significance of potential cumulative effects has been determined in accordance with the criteria set out in Table 15.1, which are derived from guidance set out within DMRB Volume 11 and which have been applied to other major highway infrastructure schemes undertaken for Highways England. In addition, each environmental topic specialist has used the information provided, their topic specific guidance, as well as their professional judgement to assess the significance of potential cumulative effects.

Table 15.1: Combined and cumulative effects significance

Significance category	Typical descriptors of effect
Very large (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be very highly significant (positive or negative). Effects would be permanent for receptors of very high value.
Large (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be highly significant (positive or negative). Effects would be: • Permanent for a receptor or receptors of high value • Localised for a receptor or receptors of very high value, or • Temporary for a receptor or receptors of very high value.
Moderate (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be significant (positive or negative). Effects would be: • Permanent for a receptor or receptors of medium value • Localised for a receptor or receptors of high value, or • Temporary for a receptor or receptors of high value.

Significance category	Typical descriptors of effect
Slight (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be noteworthy, but not significant (positive or negative). Effects would be: • Permanent for receptors of low value • Localised for a receptor or receptors of medium value, or • Temporary for a receptor or receptors of medium value.
Neutral	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be negligible and not significant (positive or negative).

15.3.29 Within the assessment, the value (or sensitivity) of receptors is based on the highest rating attributed by the relevant environmental topic assessments. For example, if a receptor is high value for landscape and moderate value for noise, it is deemed to be high value for the purpose of the cumulative and in-combination assessment.

15.3.30 Combined and cumulative effects which are moderate, large or very large are deemed to be significant.

15.4 Scoping

15.4.1 The proposed scope of the cumulative impact assessment was detailed in the EIA Scoping Report (Highways England, 2018) submitted to The Inspectorate on 15 March 2018 (refer to Chapter 1: Introduction, para. 1.3.5).

15.4.2 An overview of the Inspectorate's Scoping Opinion (refer to Appendix 4.1, [**TR010022/APP/6.3**]) in relation to the cumulative impact assessment is presented in Table 15.2. Where the assessment has been undertaken in accordance with the Scoping Opinion point, a response and the relevant ES section is provided; where an alternative approach has been agreed with the relevant stakeholders, an explanation is provided.

Table 15.2: Scoping opinion and response

Scoping Opinion	Where addressed within the ES
Planning Inspectorate	
16.3.1: Study area: Study area are not defined but are proposed to be based on a zone of influence defined by the environmental topic specialists. The ES should include justification for the zone of influence adopted, which should be consistent with the study area for each aspect in isolation.	Refer to Section 15.6 and the zone of influence details as presented in Appendix 15.1 [**TR010022/APP/6.3**]

Scoping Opinion	Where addressed within the ES
South Derbyshire District Council	
This Authority welcomes a commitment to look at the cumulative effects of this and other developments locally. I note that section 16.3.3 proposes a staged process as follows: • Stage 1: establish the project's zone of influence and identify a long list of 'other development'; • Stage 2: identify a shortlist of 'other development' for the cumulative impact assessment; • Stage 3: information gathering; and • Stage 4: assessment The South Derbyshire Local Plan includes allocations for a large number of dwellings in the vicinity of Mickleover which could, together with this proposal, affect traffic flows and volumes on roads within the City, and potentially also air quality in the City. On this basis the Council would be happy to provide an up to date position on sites under construction, consented or committed in the vicinity of the site at the point environmental assessment work is undertaken.	Details of developments scoped into the cumulative impact assessment were communicated to the various local councils in January 2019 for comment (refer to Section 15.5). With regard to developments included within the traffic model, reference should be made to the Transport Assessment Report [**TR010022/APP/7.3**]. Given the inclusion of future development proposals across the region within the traffic model, the noise and air quality impact assessments reported herein are inherently cumulative impact assessments (refer to Chapter 5: Air Quality and Chapter 9: Noise and Vibration). Also refer to Section 15.5.

15.5 Consultation

15.5.1 The Preliminary Environmental Information Report (PEIR) was published in September 2018 (Highways England, 2018) and presented the environmental information collected together with the preliminary findings of the assessment of likely significant environmental effects of the Scheme at the time. The cumulative assessment chapter within the PEIR provided details of the proposed ZoI to be adopted and an initial list of developments likely to be considered within the cumulative assessment. No consultee comments were received regarding the cumulative assessment details as presented within the PEIR.

15.5.2 Derby City Council (DCiC), Erewash Borough Council (EBC), South Derbyshire District Council and Amber Valley Borough Council were all consulted with regard to the planning applications within their respective regions in late 2018.

15.5.3 Following the collation and review of the long list of developments, a copy of the proposed shortlist of projects to be included within the cumulative assessment was circulated to the local planning authorities in January 2019 (those as detailed in para. 15.5.2) for comment. Comments received from all local authorities were used to finalise the shortlist of developments as illustrated in Figure 15.2 [**TR010022/APP/6.2**], detailed in Appendix 15.3 [**TR010022/APP/6.3**] and assessed in Section 15.10.

15.6 Study area

15.6.1 Taking into account the ZoI as detailed in Appendix 15.1 [**TR010022/APP/6.3**], three study areas have been adopted in the assessment to enable all developments which could potentially cause significant cumulative effects with the Scheme to be identified:

- A 100m study area covering all planning applications.
- A 2km study area for all planning applications determined to be major developments.
- A 5km study area for Nationally Significant Infrastructure Projects (NSIPs) and major road projects.

15.6.2 In accordance with the Planning Inspectorate's advice note seventeen (The Planning Inspectorate, 2015) developments which were outside, but close to the study area limits, were also included for consideration within the assessment, as applicable.

15.7 Baseline conditions

15.7.1 Baseline environmental conditions within the study area are as detailed in Chapters 5 to 13 in this ES.

15.7.2 Any developments identified as being completed and operational by April 2019 have been considered as part of the baseline conditions as reported within the preceding topic chapters.

15.7.3 Any development that has been permitted, but construction has not yet started or been completed, these have been included within the future baseline for Scheme construction (2020) and operation (2024) scenarios and assessed in the topic chapters as applicable.

15.8 Assessment assumptions and limitations

15.8.1 This assessment is based upon the Scheme design and details regarding Scheme construction and operation as provided in Chapter 2: The Scheme.

15.8.2 The combined and cumulative assessments have been constrained by the limitations, assumptions and uncertainties presented within the individual assessments reported within Chapters 5 to 13.

15.8.3 The cumulative assessment has been undertaken using available third-party information relating to the predicted environmental effects of the shortlisted development projects (refer to Appendix 15.3 [**TR010022/APP/6.3**]). Where a planning application for a development has not been formally submitted for determination, the assessment has been constrained by the limited environmental information available within the public domain.

15.8.4 For the shortlisted development projects that do not comprise development requiring EIA, the cumulative assessment has identified that these developments are unlikely to give rise to significant environmental effects. Nevertheless, whilst it has been assumed that such developments are unlikely to contribute to the effects of the Scheme and result in significant cumulative effects, such developments within proximity to the Scheme have been included within the assessment, where relevant.

15.8.5 The DCiC, EBC, South Derbyshire District and Amber Valley Borough Council planning portals, the Planning Inspectorate's website and the Highways England improvements and major road projects website were last checked for new developments to add to the long list in January 2019, with a final check for any new developments taking place prior to DCO application submission.

15.9 Assessment of combined effects of the Scheme

15.9.1 This section provides a summary of the potential combinations of impacts which have been identified as part of the assessments reported within Chapters 5 to 13, and which are considered likely to affect a single receptor.

15.9.2 The amenity section of Chapter 12: People and Communities, considers the combined residual effects from other assessment topics (noise, air quality, traffic, landscape and visual) which could affect people's enjoyment of a public right of way, community facility or public open space. Chapter 14: Climate also includes specific consideration of combined climate impacts. The in-combination climate change impact (ICCI) assessment did not identify the potential for significant combined effects of future climate change and the Scheme on identified receptors in the surrounding environment.

15.9.3 Table 15.3 and Table 15.4 include details of the receptors which may be subject to combined effects due to the Scheme; in some cases, the combined effect is equivalent to the 'worst case' effect already identified for a single environmental topic. Where it is considered that the combination of impacts may increase the overall impact magnitude, the resulting effect has been assigned based upon the professional judgement of the relevant topic specialists and in accordance with the significance criteria set out within Table 15.1.

Table 15.3: Summary of potential combined impacts upon single receptors (Scheme construction)

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Kingsway junction						
Kingsway hospital site – Cherry Tree Close (residential)	High	• Visual (Slight adverse) • Noise (Adverse impact - not significant) • Dust (Slight adverse); • Air quality (Imperceptible) • Severance (No additional effects)	Temporary	Local	None considered practical above the measures as outlined within the Outline Environmental Management Plan (OEMP).	Slight adverse
Greenwich Drive South (residential)/ Public open space	High	• Visual (Moderate adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Small deterioration) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Kingsway Park Close (residential)	High	• Visual (Moderate adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Small deterioration) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Kingsway/Raleigh Street (residential)	High	• Visual (Slight adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Medium deterioration) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Users of NR54 and NR68 and RR66	Medium	• Visual (Large adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Minor adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Markeaton junction						
Greenwich Drive North (residential)	High	• Visual (Large adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Windmill Hill Lane (residential)	High	• Visual (Slight adverse/Neutral) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Small deterioration) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Markeaton Park (public open space)	High	• Visual (Moderate adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Royal School for the Deaf (educational and residential)	High	• Visual (Moderate adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Large deterioration, but within applicable limits) • Severance (Slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Users of RR66	Medium	• Visual (Moderate/slight adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Minor adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Little Eaton junction						

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
South-east Allestree (residential)	High	• Visual (Slight adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Ford Farm Mobile Home Park (residential)	High	• Visual (Slight adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse
Little Eaton village (residential)	High	• Visual (Slight adverse) • Noise (Adverse impact – not significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Slight adverse
Breadsall village (residential)	High	• Visual (Neutral) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Likely slight adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Derwent Valley Heritage Way	High	• Visual (Large adverse) • Noise (Adverse impact - significant) • Dust (Slight adverse) • Air quality (Imperceptible) • Severance (Minor adverse)	Temporary	Local	None considered practical above the measures as outlined within the OEMP.	Moderate adverse

Table 15.4: Summary of potential combined impacts upon single receptors (Scheme operation)

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Kingsway junction						
Kingsway hospital site – Cherry Tree Close (residential)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Negligible/minor increase) • Air quality (Small improvement) • Severance (No additional effects)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse to neutral
Greenwich Drive South (residential)/ Public open space	High	• Visual (Moderate adverse Year 1 & Slight adverse Year 15) • Noise (Negligible/minor increase/decrease) • Air quality (Small improvement) • Severance (Likely slight beneficial and slight adverse)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Moderate adverse (Year 1) reducing to slight adverse following maturation of planting

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Kingsway Park Close (residential)	High	• Visual (Slight adverse in Year 1 & Year 15) • Noise (Negligible decrease to minor increase) • Air quality (Small deterioration) • Severance (Likely slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse
Kingsway/Raleigh Street (residential)	High	• Visual (Slight adverse Year 1 & Neutral Year 15) • Noise (Moderate decrease to negligible increase) • Air quality (Medium improvement) • Severance (Likely slight beneficial and slight adverse)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse (Year 1) reducing to neutral
Users of NR54 and NR68 and RR66	Medium	• Visual (Slight adverse Year 1 & neutral Year 15) • Noise (Range of increases and decreases along the route) • Air quality (Imperceptible change) • Severance (No change)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse (Year 1) reducing to neutral
Markeaton junction						

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Greenwich Drive North (residential)	High	• Visual (Moderate adverse Year 1 & slight adverse Year 15) • Noise (Minor decrease to minor increase) • Air quality (Small improvement to small deterioration) • Severance (Likely slight beneficial and slight adverse)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Moderate adverse (Year 1) reducing to slight adverse following maturation of planting
Windmill Hill Lane (residential)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Minor increase) • Air quality (Imperceptible change) • Severance (Likely slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse to neutral
Markeaton Park (public open space)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Negligible increase to moderate decrease) • Air quality (Small improvement) • Severance (Slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Neutral

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Lydia House (used by boarding pupils during the week) and the Karten building at the Royal School for the Deaf (educational and residential)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Moderate increase) • Air quality (Small deterioration) • Severance (Slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Moderate adverse (other buildings within the Royal School for the Deaf would experience no more than a slight adverse effect)
Users of RR66	Medium	• Visual (Slight adverse Year 1 & slight adverse/Neutral Year 15) • Noise (Range of increases and decreases along the route) • Air quality (Imperceptible change) • Severance (Moderate beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse (Year 1) reducing to neutral
Little Eaton junction						
South-east Allestree (residential)	High	• Visual (Slight adverse Year 1 & Neutral Year 15) • Noise (Negligible/minor increase) • Air quality (Small deterioration) • Severance (Likely slight adverse)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse

Receptor	Value	Potential in-combination impact	Duration	Scale	Mitigation (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Ford Farm Mobile Home Park (residential)	High	• Visual (Slight adverse Year 1 & Neutral Year 15) • Noise (Negligible increase/decrease) • Air quality (Medium improvement) • Severance (Likely slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse (Year 1) changing to slight beneficial
Little Eaton village (residential)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Negligible/minor increase) • Air quality (Small deterioration) • Severance (Likely slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Slight adverse (Year 1) reducing to neutral
Breadsall village (residential)	High	• Visual (Neutral in Year 1 & Year 15) • Noise (Negligible increase) • Air quality (Imperceptible change) • Severance (Likely slight beneficial)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Neutral
Derwent Valley Heritage Way	High	• Visual (Moderate adverse Year 1 & slight adverse Year 15) • Noise (Range of increases and decreases along the route) • Air quality (Imperceptible change) • Severance (No change)	Permanent	Local	None considered practical above the mitigation measures included in the Scheme design and outlined within the OEMP.	Moderate adverse (Year 1) reducing to slight adverse following maturation of planting

Construction

15.9.4 Table 15.3 indicates that a number of receptors (such as residential properties) have the potential to experience combined impacts associated with visual intrusion, noise, air quality (due to construction phase traffic management proposals), dust and severance during the Scheme construction phase. Such combined impacts are predicted where Scheme construction activities would be taking place in close proximity to such receptors, and where traffic management proposals could bring traffic closer to receptors.

15.9.5 The mitigation measures that have been outlined in the assessments presented herein (refer to Chapters 5 to 13) are included within the OEMP (refer to Appendix 2.1 [**TR010022/APP/6.3**]). The OEMP thus includes a range of good practice measures associated with mitigating potential environmental impacts. The OEMP has the combined aim of controlling individual impacts as well as reducing the potential for combined cumulative effects. The measures detailed within the OEMP (refer to Appendix 2.1 [**TR010022/APP/6.3**]) would be developed into a Construction Environmental Management Plan (CEMP) by the selected construction contractor which would be implemented for the duration of the Scheme construction phase.

15.9.6 The CEMP would be prepared and implemented by the construction contractor and would include a range of best practice construction measures that aim to minimise the potential for construction phase environmental impacts (e.g. impacts associated with visual intrusion, noise, dust, severance etc.). These measures would take account of the potential interaction of impacts upon receptors in close proximity with the construction works. In addition to implementation of the CEMP during the construction phase, appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of disruption and cumulative effects (e.g. web-based, newsletters, newspapers, radio announcements etc.). This would include the appointment of a Community Relations Manager (CRM) responsible for leading engagement with affected communities. A complaint management system would be in place, in line with systems used by Highways England on other major infrastructure projects. Any complaints would be investigated and appropriate action taken as required. The complainant would be provided with a response outlining the results of the investigation and any action taken.

15.9.7 Given that the measures set out within the CEMP would minimise the potential for significant combined cumulative impacts in the vicinity of the Scheme, no additional mitigation measures are proposed.

Operation

15.9.8 Table 15.4 indicates that significant combined effects associated with Scheme operation are not predicted for the vast majority of receptors in close proximity to the Scheme. The only exception being two buildings within the Royal School for the Deaf complex, namely Lydia House (which is used by boarding pupils during the week), and the Karten building (which consists of offices and meeting rooms). These combined effects are due to these two buildings experiencing a moderate adverse noise effect during the Scheme operational phase as a result of the predicted operational traffic. All other buildings within the Royal School for the Deaf are predicted to experience negligible or minor (not significant) noise effects (and thus also non-significant combined effects). Given that noise mitigation measures have been included in the Scheme design to mitigate noise effects at the Royal School for the Deaf complex as far as practicable (namely a 4m high noise barrier along the school boundary with the Scheme), no further mitigation measures are proposed.

15.10 Assessment of cumulative effects with other development

15.10.1 As detailed in Appendix 15.3 [**TR010022/APP/6.3**], a total of 10 developments have been considered within the cumulative effects assessment as follows (refer to Figure 15.2 [**TR010022/APP/6.2**]) – these shortlisted developments are:

- Mackworth College site development (Development No 6).
- Land at Onslow Road Mickleover (Development No 7).
- Land at Rough Heanor Farm, Mickleover (Development No 8).
- Kingsway hospital site development - Phase 1 & Phase 2 (Development No 21).
- Redevelopment of Kingsway House (Development No 23).
- Hackwood Farm development, Mickleover (Development No 29/41).
- Land North of Mansfield Road, Breadsall (Development No 39/47).
- Land South of Mansfield Road, Breadsall Hilltop (between Porters Lane and Lime Lane) (Development No 40).
- Ford Farm (Development No 44).
- Land at Kedleston Road (Development No 49).

15.10.2 As detailed in Appendix 15.2 [**TR010022/APP/6.3**], two developments on the long list have an association with the Scheme, but have been scoped out of the cumulative assessment as follows:

- **Utilities works associated with the Scheme, located outside of the Scheme boundary:** As indicated in Chapter 2: The Scheme, Section 2.6, numerous utilities works would be undertaken within the Scheme boundary and have been assessed as part of the Scheme development. However, there remains the risk that some utility companies would need to undertake some minor connection works within existing highway carriageways that are outside the Scheme boundary through permitted development rights. This includes minor connection works outside the Scheme boundary on the A52 Ashbourne Road. Such activities would be temporary, limited in nature, and would be undertaken within existing highway carriageways. In addition, such works would need to be undertaken in accordance with good practice to mitigate potential environmental impacts. Thus whilst these works would overlap with Scheme construction activities, the temporary and small scale nature of these works means that significant cumulative effects would be avoided (following the adoption of good practice mitigation measures).
- **Two Highways England Designated Fund projects:** Highways England is investigating the feasibility of two Designated Fund projects in the vicinity of the Scheme that relate to biodiversity, namely: i) the feasibility of a green bridge structure at Markeaton junction rather than the 'like-for-like' Markeaton footbridge replacement which would be provided by the Scheme; ii) biodiversity enhancement works within areas of open space located adjacent to the Scheme (i.e. Markeaton Park and Mill Ponds, Ford Lane Site of Interest, noting that these areas have been identified through stakeholder engagement). Such feasibility studies are being undertaken separately to the Scheme and are not covered by the DCO application. These projects have been scoped out of the assessment given that these enhancement projects are at a feasibility stage and thus there is no certainty that they will progress. These developments are entirely separate to the DCO application and could be undertaken with or without Scheme progression. Each development is being considered on its own merit and would need to be progressed via separate planning processes.

15.10.3 An analysis of the potential for cumulative effects associated with the shortlisted developments has been undertaken taking into account their overlap with the respective ZoI – details of this analysis are provided in Appendix 15.4 [**TR010022/APP/6.3**].

15.10.4 The analysis undertaken indicates that none of the ten developments scoped into the assessment have been identified as having the potential to interact with the Scheme in a manner that would generate potentially significant cumulative effects. In most cases, this is due to the other developments being located at such a distance from the Scheme that any potential for impact interaction is limited, or the development is of a scale such that the effects they generate are limited (with applicable mitigation) during both their construction and operation. With regard to operational effects, as traffic forecasts used to support this EIA already include the contribution from other developments (refer to para. 15.3.27), cumulative impacts associated with operational traffic are already covered by the air quality and noise assessments reported herein.

15.10.5 The assessment provided in Appendix 15.4 [**TR010022/APP/6.3**] indicates that some impact interactions are possible, although any generated cumulative effects are predicted to be slight adverse at most and only occur during the Scheme construction phase. Consequently, no mitigation measures specific to the identified cumulative effects are proposed, above the standard measures already proposed in the OEMP (refer to Appendix 2.1 [**TR010022/APP/6.3**]). However, the Scheme contractor would liaise with developers of adjacent land plots and where possible, coordinate site activities in a manner that would assist in further minimising the risks of cumulative effects.

15.11 Monitoring

15.11.1 No mitigation measures specific to identified significant cumulative effects are proposed, above those measures already set out in the OEMP (refer to Appendix 2.1 [**TR010022/APP/6.3**]. On that basis, no monitoring of significant effects is proposed.

15.12 Summary

15.12.1 A summary of the cumulative impact assessment is presented in Table 15.5.

Table 15.5: Cumulative effects - summary of effects

Effects	Phase	Impact description	Design and mitigation measures (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Combined cumulative effects	Construction	Combined effects of Scheme construction on individual receptors	Measures as detailed in the OEMP.	• Temporary moderate adverse combined visual, noise, air quality, dust and severance effects on representative properties at Greenwich Drive South, Kingsway Park Close, Kingsway/Raleigh Street, Greenwich Drive North, Windmill Hill Lane, the Royal School for the Deaf, south-east Allestree, Ford Farm Mobile Home Park, Breadsall village. • Temporary moderate adverse combined visual, noise, air quality, dust and severance effects on recreational users of Greenwich Drive South public open space, NR54 and NR68 and RR66, Markeaton Park and the Derwent Valley Heritage Way.
	Operation	Combined effects of Scheme operation on individual receptors	Measures as detailed in the OEMP.	• Temporary moderate adverse (Year 1) combined visual, noise, air quality, severance effects on representative properties at Greenwich Drive South and Greenwich Drive North reducing to slight adverse following maturation of landscape planting. • Permanent moderate adverse combined visual, noise, air quality effects at Lydia House (used by boarding pupils) and the Karten building (offices and meeting rooms) at the Royal School for the Deaf (other buildings within the school would experience no more than a slight adverse combined effect). • Temporary moderate adverse (Year 1) combined visual, noise, air quality, dust and severance effects on recreational users of the Derwent Valley Heritage Way, reducing to slight adverse following maturation of landscape planting.

Effects	Phase	Impact description	Design and mitigation measures (for OEMP refer to Appendix 2.1 [TR010022/APP/6.3])	Residual effect
Cumulative effects with other developments	Construction	Combined effects due to Scheme and other developments during Scheme construction	Measures as detailed in the OEMP. Mitigation measures applicable to other developments.	• Mackworth College development: no more than short-term slight adverse cumulative effects during the Scheme construction phase (landscape and visual). • Land at Onslow Road, Mickleover: no more than short-term slight adverse cumulative effects during the Scheme construction phase (landscape and visual). • Kingsway hospital site development: no more than slight adverse cumulative effects during the Scheme construction phase (air quality, landscape and visual, noise and water resources). • Land north of Mansfield Road, Breadsall: no more than slight adverse cumulative effects during the Scheme construction phase (cultural heritage).
	Operation	Combined effects due to Scheme and other developments during Scheme operation	Measures as detailed in the OEMP. Mitigation measures applicable to other developments.	No significant cumulative effects during Scheme operation.

15.13 References

Highways Agency (2008) Design Manual for Roads and Bridges (DMRB) Volume 11, Section 2 Part 5: Assessment and Management of Environmental Effects (HA205/08).

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