M54 to M6 Link Road

TR010054

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

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

M54 to M6 Link Road

Development Consent Order 202[ ]

6.1 Environmental Statement

Chapter 15 Assessment of Cumualtive Effects

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15 Assessment of Cumulative Effects

15.1 Introduction

15.1.1 This chapter presents the results of the assessment of the likely significant combined and cumulative environmental effects of the Scheme following the methodology set out in Design Manual for Roads and Bridges (DMRB) Volume 11, Section 2 Part 4 LA 104 Environmental Assessment and Monitoring (Ref 15.1) and the Planning Inspectorate's Advice Note Seventeen (Ref 15.2).

15.1.2 This chapter of the Environmental Statement (ES) has been prepared by competent experts with relevant and appropriate experience. The technical lead for the assessment of cumulative effects has 13 years of relevant experience and has professional qualifications as summarised in Appendix 1.1 [TR010054/APP/6.3].

15.2 Legislation and policy framework

15.2.1 Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 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)[1] (Ref 15.3). NPSNN Sections 4 and 5 set out policies to guide how Development Consent Order (DCO) applications will be decided and how the impacts of national networks infrastructure should be considered.

15.2.3 Paragraph 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

Combined effects

15.3.1 Combined effects are defined as the effect resulting from several different impacts from a single scheme (in this case the Scheme) on a single receptor e.g. a single receptor, such as a property or habitat, being subject to noise, air quality and visual impacts associated with the Scheme.

Study area

15.3.2 The study area for the assessment of combined effects is defined by the study areas used in each of the environmental topics set out in Chapters 5 to 14.

[1] Although other policies can have weight as relevant and important matters in decision making. See Case for the Scheme for more information [TR010054/APP/7.2].

Data source

15.3.3 The sources of data for the assessment of combined effects are the specialist environmental chapters within this ES.

Assessment of effects

15.3.4 The assessment methodology involves the identification of environmental resources and receptors where there is potential for more than one impact to be experienced and therefore potential for interactions between these. This enables the identification of the overall combined environmental effects of the Scheme.

15.3.5 The following receptor groups have been identified and considered in relation to the combined effects:

- human receptors (residential and community facilities);
- ecological receptors;
- built heritage features;
- waterbodies; and
- travellers (walkers, cyclists, horse riders, and motorised users).

15.3.6 Potential interactions were identified by reviewing the impacts identified within Chapters 5 to 14. The following chapters are considered to have combined effects relating to the above receptors, and therefore are not repeated in this chapter:

- Chapter 6: Cultural Heritage and Chapter 8: Biodiversity consider the potential interactions of effects relating to construction and operational noise and air quality, and construction dust on receptors. Chapter 8: Biodiversity also includes consideration of effects on the water environment and how this could affect ecological receptors.
- Chapter 12: Population and Human Health, 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 includes specific consideration of combined climate impacts. The combined 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.
- Chapter 13: Road Drainage and the Water Environment considers the effects of traffic in combination with changes that would be made to the water environment.

15.3.7 This assessment has therefore considered the combined effects on residential receptors. The types of impacts that could be experienced by these receptors and may interact are noise, air quality and visual effects; during both construction and operation.

15.3.8 In order to consider effects that are not significant, but could become significant in combination with other effects, the following effects have been considered for each topic:

- Air quality – receptors identified as sensitive locations with respect to construction dust and receptors experiencing a small magnitude or larger change in nitrogen dioxide or particulate matter in the Opening Year.
- Visual effects – receptors experiencing a slight adverse or worse impact during construction or in the Opening Year.
- Noise and Vibration – receptors experiencing a slight adverse or worse impact during construction or in the Design Year.

15.3.9 For definitions of these assessment criteria please refer to Chapter 5: Air Quality, Chapter 7: Landscape and Visual Effects and Chapter 11: Noise and Vibration.

15.3.10 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, and taking into account the criteria and definitions set out in Table 15.2 of this report in line with the DMRB (Ref 15.1).

Cumulative effects

15.3.11 Cumulative effects are defined as the effect resulting from impacts of the Scheme acting together with an impact or impacts associated with other proposed development schemes on a single receptor. This can be two similar impacts acting on a single receptor (such as increases in air quality emissions as a result of the Scheme and another development), or two different impacts acting on a single receptor (such as an increase in air quality emissions from the Scheme and an increase in noise levels from another development).

15.3.12 The assessment methodology follows the guidance set out by the Inspectorate in Advice Note Seventeen which requires a four-stage approach to the assessment of cumulative effects (Ref 15.2).

Stage 1 – establish a long-list

15.3.13 The maximum study area or cumulative 'zone of influence' (ZoI) is defined in Table 15.1 below for each environmental topic. This is based on the study areas used for the topic assessments in Chapters 5 to 14, and is based on an assumption that sensitive receptors at the furthest extent of the Scheme study areas would also be at the furthest extent of a theoretical study area for other development. These ZoIs were then combined to form the search area in which to identify other development. The cumulative ZoI are shown on Figure 15.1 [TR010054/APP/6.2].

15.3.14 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, during construction and operation. Chapter 4: Environmental 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.

15.3.15 Full details of the other development projects included within the traffic model (covering developments in South Staffordshire, Wolverhampton, Cannock Chase and Walsall) and the factors applied during the modelling process, are presented within the Transport Assessment Report [TR010054/APP/7.4]. These developments include improvements to the A460, A461 and M6 Junction 10. Construction and operation of these noted road improvement schemes has been scoped out of the cumulative effects assessment on the basis that they are relatively minor changes to existing infrastructure that would not result in likely significant effects, or are assessed within the ES chapters which are inherently cumulative.

15.3.16 The following assessments, as noted in Table 15.1, have relied wholly, or in part, on the forecasts derived from the traffic model for the Do-Minimum scenario and the Do-Something scenario:

- Air Quality (see Chapter 5).
- Noise and Vibration (see Chapter 11).
- Population and Human Health (as part of the assessment of impacts on land use and access) (see Chapter 12).
- Road Drainage and the Water Environment (as part of the calculations for road runoff and accidental spillages) (see Chapter 13).

15.3.17 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 11: 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).

Table 15.1: Cumulative effects assessment - Zones of Influence

Environmental topic	Scheme study area	Cumulative ZoI
Air Quality	**Construction:** 200 m from construction activities for dust and vehicle emissions As the construction phase traffic data includes traffic associated with other developments, the air quality impact assessment reported within Chapter 5: Air Quality is inherently cumulative.	Up to 400 m from the Scheme boundary.
	Operation: The ‘affected road network’ within the traffic model defines study area, as described in	Not applicable.

Environmental topic	Scheme study area	Cumulative ZoI
	Chapter 5: Air Quality. As the operational phase traffic data includes traffic associated with other developments, the air quality impact assessment reported within Chapter 5 is inherently cumulative.	
Cultural Heritage	**Construction and Operation:** 1 km from the Scheme boundary for designated heritage assets and their settings.	Up to 2 km from the Scheme boundary.
Landscape and Visual	**Construction and Operation:** 1 km from the centreline of the Scheme, subject to localised variations based on the Zone of Theoretical Visibility (ZTV) and on-site verification.	Up to 2 km from the centreline of the Scheme, adjusted based on the ZTV.
Biodiversity	**Construction and Operation:** 2 km from the Scheme boundary for designated sites. Within this, the study area for assessment purposes varies according to specific biodiversity receptors, is informed by Site of Special Scientific Interest risk zones and for species by Natural England and best practice guidance from the Chartered Institute of Ecology and Environmental Management and other sources. As the European Sites Appropriate Assessment Report (Habitats Regulations Assessment) [TR010054/APP/6.9] has concluded there are no likely environmental effects on International Sites, the 30 km study area is not relevant in the context of the cumulative assessment.	Up to 4 km from the Scheme boundary.
Geology and Soils	**Construction and Operation:** The Scheme boundary and an additional buffer of 250 m for geology, soils and land contamination. An extended study area of 1 km from the Scheme boundary has been considered appropriate for groundwater, surface water and potable water abstractions.	Up to 1 km beyond the Scheme boundary.
Material Assets and Waste	**Construction:** The estimated materials availability and waste capacity data used in the Scheme assessment (Chapter 10: Material Assets and Waste) are based on future regional demand, including other significant projects within the West Midlands region.	Not applicable.

Environmental topic	Scheme study area	Cumulative ZoI
	Operation: Operational phase material and waste management issues are scoped out of the assessment as unlikely to result in significant effects (See Chapter 10: Material Assets and Waste).	Not applicable.
Noise and Vibration	**Construction:** The vibration study area is a maximum of 100 m from the works. The noise study area is a maximum of 600 m from the Scheme boundary. As the construction phase traffic data includes traffic associated with other developments, the noise and vibration impact assessment reported within Chapter 11: Noise and Vibration is inherently cumulative.	Up to 1.2 km beyond the Scheme boundary.
	Operation: The 'affected road network' within the traffic model defines study area, as described in Chapter 11: Noise and Vibration. As the operational phase traffic data includes traffic associated with other developments, the air quality impact assessment reported within Chapter 11: Noise and Vibration is inherently cumulative.	Not applicable.
Population and Human Health	**Construction and Operation:** The study area for the assessment of impacts on land use and accessibility includes residential properties, community land and assets, businesses, development land, WCH facilities (Public Rights of Way (PRoW, cycle routes and footways) and agricultural holdings within and up to 500 m from the Scheme boundary. The study area for the assessment of impacts on human health includes the residents within the wards of, Essington, Featherstone and & Shareshill and Cheslyn Hay North & Saredon due to their proximity to the Scheme. The health assessment presented in Chapter 12: Population and Human Health draws on information and conclusions contained within the air quality, landscape and visual, noise and vibration, road drainage and the water environment, and climate assessments. Therefore the cumulative ZoI will be as per these topics.	Up to 1 km for land use and access.
Road Drainage and the Water Environment	**Construction and Operation:** The study area is 1 km beyond the Scheme boundary for water quality; extended up to 2 km for water dependent ecological sites. The study area for flood risk is 1 km upstream and 1 km downstream of watercourse crossings.	2 km beyond the Scheme boundary for water quality and flood risk, extended up to 4 km water dependent ecological sites.

Environmental topic	Scheme study area	Cumulative ZoI
Climate	**Construction and Operation:** The study area for greenhouse gases (GHG) is the area within the Scheme boundary and the affected road network. As the construction and operational phase traffic data includes traffic associated with other developments, the climate assessment reported within Chapter 14: Climate is inherently cumulative. The study area for climate resilience and in-combination climate effects is land within the Scheme boundary the surrounding environment as informed by other environmental topic assessments study areas. Therefore no additional cumulative ZoI is identified beyond the other topic ZoIs within this table.	Not applicable.

15.3.18 A review of local planning documents, planning applications, Nationally Significant Infrastructure Projects (NSIPs) (under construction development, projects on the Inspectorate's programme of projects where a scoping report has or has not been submitted) and Transport and Works Act Orders has been undertaken to identify 'other developments' within the combined ZoI.

15.3.19 The following criteria were used to screen out development of insufficient scale, or of a type which would not result in cumulative impacts with the Scheme, as follows:

- any planning applications older than five years at the commencement date of the study (i.e. only considering applications from 2012 onwards);
- construction of small-scale agricultural buildings (e.g. storage of livestock, machinery or feed);
- house extensions or cosmetic changes to buildings;
- work to trees;
- micro-generation wind turbines;
- roof mounted solar PV panels (or ground mounted less than 50kW output);
- renewal of planning permission for retention of existing operational use;
- safeguarded land for future development plans, where there is insufficient detail what this land could potentially be used for;
- extensions to existing gypsy and traveller site provisions;
- variation to planning permissions, including reserved matters applications (where the original application would not have been considered within the assessment); and
- small scale residential uses (specifically, less than two dwellings), small amenity buildings or changes of use applications (unless it could itself result in a cumulative effect, such as a conversion of several barns into a holiday village).

15.3.20 Development has been assigned a level of certainty based on the following criteria set out in guidance by the Inspectorate:

Tier 1

- development currently under construction;
- permitted applications which have not yet been implemented (covering the past five years and taking account of those that received planning consent over three years ago and are still valid but have not yet been completed);
- refused applications, subject to appeal procedures not yet determined;
- submitted applications not yet determined;

Tier 2

- projects on the Inspectorate's Programme of Projects where a scoping report has been submitted;

Tier 3

- projects on the Inspectorate's Programme of Projects where a scoping report has not been submitted;
- development identified in the relevant Development Plan (and emerging Development Plans); and
- development identified in other plans and programmes which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

15.3.21 It should be noted that South Staffordshire Council (SSC) is currently undergoing a Local Plan review and call for sites exercise. As there is uncertainty in the likelihood of promoted sites being allocated in future development plans, the likely nature of these and timescales for delivery; these promoted sites have not been considered in this assessment.

15.3.22 A total of 51 developments were identified on the long-list. This list has been prepared in consultation with:

- Staffordshire County Council – Team Leader of the Minerals Planning Policy and Development Control team; and
- SSC – Senior Officer within the Strategic Planning (Urban Design/Landscape Planning) team.

15.3.23 Cannock Chase District Council the City of Wolverhampton Council and Walsall Council were invited to provide input on the long list but did not provide any amendments.

15.3.24 The long-list and level of certainty can be found in Table 15.1.1 in Appendix 15.1 [TR010054/APP/6.3] and on Figure 15.1 [TR010054/APP/6.2].

Stage 2 – establish a short-list

15.3.25 The developments on the long-list were reviewed to identify the potential for these developments to result in cumulative effects with the Scheme. This included consideration for the nature and scale of the development, and potential temporal and/or spatial interactions with receptors affected by the Scheme in the relevant

ZOIs. Those developments where the potential for cumulative effects was identified were placed on the shortlist.

15.3.26 For many developments, particularly site allocations, there is limited information available regarding the delivery programmes to understand temporal interactions. Where this is the case, a worst-case assumption of overlapping construction programmes (with the Scheme) and the development being fully operational by Opening Year has been applied.

15.3.27 The process of preparing the short-list has been documented and the justification for including or excluding development in the short-list is provided in Table 15.1.1 in Appendix 15.1 [TR010054/APP/6.3]. The shortlist of developments is presented in Table 15.1.2 in Appendix 15.1 [TR010054/APP/6.3] and comprises a total of six developments, the development area of which are illustrated in Figure 15.1 [TR010054/APP/6.2].

Stage 3 – data gathering

15.3.28 This stage involved sourcing further information relating to the shortlisted developments, in order to establish the details of their likely environmental effects and potential for cumulative effects with the Scheme. This information has been primarily obtained from documentation submitted as part of planning applications, or used in the appraisals for site allocations. Information gathered for each development included (where available) the design of the development, its location, the expected timelines and likely environmental effects.

Stage 4 – assessment

15.3.29 The assessment considers those developments outlined in the short-list, considered to have the potential to generate a cumulative effect together with the Scheme. The following information is documented for each of the developments on the short-list:

- a brief description of the development;
- an assessment of the cumulative effect with the Scheme;
- proposed mitigation applicable to the development; and
- the likely residual cumulative effect.

15.3.30 The criteria for determining the significance of residual cumulative effects are based upon:

- the duration of effect, i.e. will it be temporary or permanent;
- the extent of effect, e.g. the geographical area of an effect;
- the type of effect, e.g. whether additive or synergistic;
- the frequency of the effect;
- the ‘value’ and resilience of the receptor affected; and
- the likely success of mitigation.

Significance criteria

15.3.31 The significance of potential combined and cumulative effects has been determined in accordance with the criteria set out in Table 15.2, which are derived from professional experience of undertaking cumulative assessments for other nationally significant highways infrastructure projects.

Table 15.2: Combined and cumulative effects significance

Significance category	Typical descriptors of effect
Very large (typically adverse only)	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: • widespread/large scale for a receptor of high value; • permanent for a receptor or receptors of high value[1]; • 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.
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).

15.3.32 Within the assessment for combined effects, 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 medium

[1] Note that the term 'value' refers here to both intrinsic value and sensitivity.

value for biodiversity, it is deemed to be high value for the purpose of the cumulative and combined assessment.

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

Scoping response

15.3.34 The proposed scope of the cumulative assessment was detailed in the EIA Scoping Report (Ref 15.4) submitted to the Inspectorate on 11 January 2019. An overview of the Inspectorate's Scoping Opinion in relation to the assessment of cumulative effects is presented in Table 15.3. 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 15.3: Scoping opinion and response

Scoping Opinion	Where addressed in the ES
The Inspectorate	
Assessments of material (mineral) and waste use should consider the cumulative impacts of other significant projects in the area. The geographical extent of the assessment should reflect the anticipated extent of the impacts.	The estimated materials availability and waste capacity data used in the Scheme assessment (Chapter 10: Material Assets and Waste) are based on future regional demand, including other significant projects within the West Midlands region.
The Inspectorate notes that the ARN and traffic model area have not been considered when defining study areas for the Greenhouse Gas (GHG), Climate Resilience, and In-Combination Climate Impact assessments. The Inspectorate advises that this information is relevant to the assessment and the ES should clearly justify if and how it has been taken into account.	Refer to Chapter 14: Climate, Section 14.3 'Assessment Methodology'.

15.4 Assessment assumptions and limitations

15.4.1 The assessment of cumulative effects is based on publicly available information relating to other developments.

15.5 Assessment of combined effects

15.5.1 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 14, and which are considered likely to affect a single receptor.

15.5.2 Table 15.4 and 15.5 include details of the receptors which may be subject to a combined effect 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 15.2.

Table 15.4: Summary of potential combined impacts upon a single receptor (construction)

Receptor	Value	Potential Combined Impacts					Mitigation	Residual (cumulative) effect
		Air quality	Dust	Noise	Vibration	Visual		
Residential receptors on Park Road and Dark Lane (closest properties to the Scheme)	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	Significant adverse effects are anticipated (on receptors on Dark Lane only)	Significant adverse effects are anticipated (on receptors on Dark Lane only)	VP14: Major adverse (significant)	No additional mitigation has been identified above the measures as outlined within the Outline Environmental Management Plan (OEMP) [TR010054/APP/6.11].	There would be a temporary moderate adverse combined effect (significant) on receptors of high value as a result of noise, vibration and visual impacts.
Residential receptors on Hilton Lane (east of the Scheme)	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	Significant adverse effects are anticipated	Significant adverse effects are anticipated	VP15: Moderate adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11]. An appropriately sized strip of mitigation woodland would be planted at the start of the construction phase on land north of Hilton Lane, adjacent to the nearest group of properties located off west of the Scheme. This	There would be a temporary, moderate adverse combined effect (significant) as a result of construction derived noise, vibration and visual impacts.

Receptor	Value	Potential Combined Impacts					Mitigation	Residual (cumulative) effect
		Air quality	Dust	Noise	Vibration	Visual		
							will aim to secure screening as soon as possible for the construction and operation phases, thereby, reducing the period over which combined effects will be occur.	
Residential receptors on Hilton Lane (west of the Scheme)	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	Significant adverse effects are anticipated	Significant adverse effects are anticipated	VP07: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There is likely to be temporary moderate adverse (significant) combined effects on these properties, as a result of construction noise and vibration.
Residential receptors on the A460 Cannock Road, Featherstone	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but	Potentially adverse effects (not-significant)	No significant adverse effects are anticipated	No significant adverse effects are anticipated	VP02: Major adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects (neutral) on these properties, however, a significant adverse effect as a result of

Receptor	Value	Potential Combined Impacts					Mitigation	Residual (cumulative) effect
		Air quality	Dust	Noise	Vibration	Visual		
		below national air quality objective levels (not significant)						visual impacts would remain.
Residential receptors on the A460 Cannock Road (east of Shareshill)	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	No significant adverse effects are anticipated	No significant adverse effects are anticipated	VP10: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties that are noteworthy - Neutral.
Residential receptors at Laney Green	High*	No worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective	Potentially adverse effects (not-significant)	No significant adverse effects are anticipated	No significant adverse effects are anticipated	VP04: Moderate adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects (neutral) on these properties, however, a significant adverse effect as a result of visual impacts would remain.

Receptor	Value	Potential Combined Impacts					Mitigation	Residual (cumulative) effect
		Air quality	Dust	Noise	Vibration	Visual		
		levels (not significant)						
Residential receptors at Brookfield Farm	High*	No worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	Significant adverse effects are anticipated	Significant adverse effects are anticipated	VP11 is most representative : Moderate Adverse** (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There would a temporary, moderate adverse combined effect (significant) as a result of construction derived noise, vibration and visual impacts.
Residential receptors along Great Saredon Road	High*	No worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not	Potentially adverse effects (not-significant)	No significant adverse effects are anticipated	No significant adverse effects are anticipated	VP08: Moderate adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects (neutral) on these properties, however, a significant adverse effect as a result of visual impacts would remain.

Receptor	Value	Potential Combined Impacts					Mitigation	Residual (cumulative) effect
		Air quality	Dust	Noise	Vibration	Visual		
		significant)						
Residential receptors on Featherstone Lane	High*	No worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not-significant)	No significant adverse effects are anticipated	No significant adverse effects are anticipated	VP18: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties that are noteworthy - Neutral.

*The value/ sensitivity of noise receptors is not defined during the assessment of noise. All potentially sensitive receptors are considered to be of equal value/ sensitivity. The highest value/ sensitivity rating attributed by the relevant environmental topic assessments has therefore been adopted.

**More screening would be provided by trees and agricultural buildings than for receptors using the PRoW east of Brookfield Farm. Therefore, a lesser level of effect has been given for these receptors. This effect remains significant.

Table 15.5: Summary of potential combined impacts upon a single receptor (operation)

Receptor	Value	Potential Combined Impacts					Mitigation Air quality	Residual (cumulative) effect Dust
		Air quality	Dust	Noise	Vibration	Visual		
Residential receptors on Park Road and Dark Lane (closest properties to the Scheme)	High*	Medium increase in Annual Mean NO_2 Concentration, for those properties located closest to the Scheme and small improvements in PM_{10} (not significant)	N/A	Negligible to Minor increase in noise (not-significant)	Potentially adverse (not-significant)	VP14: Year 1: Major adverse (significant) Year 15: Moderate adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	Properties close to the Scheme are likely to experience a medium increase in NO_2 concentrations (not considered to be significant) and significant visual effects in the opening year. Combined effects that are noteworthy, but not likely to be significant, would occur in the short to medium term whilst landscape planting establishes. Effects would be slight adverse (not significant) at Year 1, reducing to neutral (not significant) at Year 15 as planting establishes. Visual effects will remain significant in the long-term but this is not a combined effect.
Residential receptors on Hilton Lane (east of the Scheme)	High*	Small increase in Annual Mean NO_2 concentration and small improvements in PM_{10} (not significant)	N/A	Negligible or minor increase/ no change/ negligible or minor decrease (not significant)	Potentially adverse (not-significant)	VP 15: Year 1: Moderate adverse (significant) Year 15: Minor adverse (not	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these receptors that are noteworthy – Neutral. However, significant visual effects would remain in the short term but this is not a combined effect.

Receptor	Value	Potential Combined Impacts					Mitigation Air quality	Residual (cumulative) effect Dust
		Air quality	Dust	Noise	Vibration	Visual		
						significant)		
Residential receptors on Hilton Lane (west of the Scheme)	High*	Small increase in Annual Mean NO_2 for properties located closest to the Scheme, with small decreases for properties located within close proximity to the A460 Cannock Road. In addition, small improvements in PM_{10} (not significant)	N/A	Moderate increase in noise (significant) for one property only.	Potentially adverse (not-significant)	VP07: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	One receptor close to the Scheme is likely experience both minor changes in NO_2 concentrations and moderate noise increases. Combined effects would be noteworthy, but unlikely to be significant. Slight adverse (not significant). For other properties, there would not likely be any significant combined effects – Neutral.
Residential receptors on the A460 Cannock Road, Featherstone and Shareshill	High*	Large decreases in Annual Mean NO_2 Concentration, for properties off the A460 in Featherstone. Small to medium decreases for properties in Shareshill (not significant)	N/A	Generally not significant, however, 18 properties (on the existing A460 bypassed by the Scheme (Featherstone, Hilton and	Potentially adverse (not-significant)	VP 02: Year 1: Major adverse (significant) Year 15: Moderate adverse (significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	Although significant beneficial effects have been identified, it cannot be assumed that a significant beneficial effect will outweigh or balance a significant adverse effect. Therefore, a worst case approach has been adopted and the medium adverse (significant) effect remains but only in relation to one environmental aspect (i.e. visual effects).

Receptor	Value	Potential Combined Impacts					Mitigation Air quality	Residual (cumulative) effect Dust
		Air quality	Dust	Noise	Vibration	Visual		
				Villa Bungalow)) will experience significant beneficial effects.				Therefore, this does not constitute a significant combined effect. There are unlikely to be any significant combined effects on these properties that are noteworthy – Neutral.
Residential receptors on the A460 Cannock Road (east of Shareshill)	High*	Small increase to small decrease in Annual Mean NO_2 Concentration (not significant)	N/A	Negligible or minor increase/ no change/ negligible or minor decrease (not significant)	Potentially adverse (not-significant)	VP 10: Year 1 and Year 15: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties that are noteworthy – Neutral.
Residential receptors at Brookfield Farm	High*	Small increase Annual Mean NO_2 Concentration (not significant)	N/A	Moderate increase (Significant)	Potentially adverse (not-significant)	VP11 is most representative: Year 1: Moderate Adverse** (significant) Year 15: Slight Adverse**	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	Initially there would be a significant combined effect (moderate adverse) on properties at Brookfield Farm as a result of traffic derived noise and visual effects. This would reduce as proposed mitigation planting matures to provide screening. In the long term the level of visual effect is likely to reduce to a level that is not significant (slight adverse) and would not contribute to a

Receptor	Value	Potential Combined Impacts					Mitigation Air quality	Residual (cumulative) effect Dust
		Air quality	Dust	Noise	Vibration	Visual		
								combined effect. However, the noise impact is likely to remain significant.
Residential receptors at Laney Green	High*	Small increase in Annual Mean NO_2 Concentration (not significant)	N/A	Negligible or minor increase/ negligible decrease (not significant)	Potentially adverse (not-significant)	VP 04: Year 1 and Year 15: Minor adverse (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties that are noteworthy – Neutral.
Residential receptors along Great Saredon Road	High*	Negligible change in Annual Mean NO_2 Concentration (not significant)	N/A	Negligible or minor increase/ no change/ negligible or minor decrease (not significant)	Potentially adverse (not-significant)	VP 08: Year 1: Moderate adverse (significant) Year 15: Minor adverse (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties that are noteworthy – Neutral.
Residential receptors on Featherstone Lane	High*	Small decreases in Annual Mean NO_2 Concentration for properties on Featherstone Lane (modelled for two properties	N/A	Negligible increase/ no change/ negligible or minor decrease (not significant)	Potentially adverse (not-significant)	VP18: Year 1 and Year 15: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There are unlikely to be any significant combined effects on these properties, therefore the effects are likely be Neutral.

Receptor	Value	Potential Combined Impacts					Mitigation Air quality	Residual (cumulative) effect Dust
		Air quality	Dust	Noise	Vibration	Visual		
		at the junction with New Road)						
*The value/ sensitivity of noise receptors is not defined during the assessment of noise and vibration. All potentially sensitive receptors are considered to be of equal value/ sensitivity. The highest value/ sensitivity rating attributed by the relevant environmental topic assessments has therefore been adopted. **More screening would be provided by trees and agricultural buildings than for receptors using the PRoW east of Brookfield Farm. Therefore, a lesser level of effect has been given for these receptors. This effect remains significant.								

Construction

15.5.3 As reported in Table 15.4 the construction of the Scheme is likely to result in significant adverse combined effects for five groups of residential receptors, those at Dark Lane and Park Road, and Hilton Lane (east of the Scheme), Hilton Lane (west of the Scheme) and one property at Brookfield Farm.

15.5.4 Properties on Hilton Lane (east and west of the Scheme) are anticipated to experience moderate adverse (significant) combined effects as a result of noise, vibration and visual impacts. This is a noteworthy effect on a receptor of high value. An appropriately sized strip of mitigation woodland would be planted at the start of the construction phase on land north of Hilton Lane, adjacent to the nearest group of properties located west of the Scheme. This would ensure that screening is realised as soon as possible for properties located east of the Scheme, thereby, reducing the period over which combined effects would be occur for these receptors.

15.5.5 Advanced planting is not possible in proximity to other receptors due to limited space for construction works.

15.5.6 Properties on Dark Lane and Park Road are anticipated to experience moderate adverse (significant) combined effects as a result of noise, vibration and visual impacts. This is a noteworthy effect on a receptor of high value.

15.5.7 One property at Brookfield Farm is anticipated to experience moderate adverse (significant) combined effects as a result of noise, vibration and visual impacts. This is a noteworthy effect on a receptor of high value.

15.5.8 Neutral combined effects (not significant) have been identified for residential receptors on Featherstone Lane, at Laney Green, along Great Saredon Road and on the existing A460 Cannock Road (Featherstone and east of Shareshill).

Operation

15.5.9 As reported in Table 15.5 the operation of the Scheme is likely to result in significant adverse combined effects for one property at Brookfield Farm. There are likely to be temporary significant adverse combined effects on one residential receptor at Brookfield Farm as a result of traffic derived noise and visual effects. Once proposed mitigation planting matures it would provide greater levels of screening; the level of visual effect is likely to reduce, and therefore the combined effect is likely to reduce to a level that is not significant (slight adverse) but the level of the noise effect is likely to remain significant, as reported in Chapter 11: Noise and Vibration.

15.5.10 Properties on Dark Lane and Park Road are anticipated to experience noteworthy combined effects as a result in increased emissions to air and visual effects at Year 1. This is considered to be slight adverse in combination effect, however this is not likely to be significant. The level of visual effects are expected to reduce over the short to medium-term as landscape planting establishes, increasing screening for properties on Dark Lane and Park Road. Visual impacts would remain significant 15 years after the Scheme becomes operational, however, this is not a combined effect.

15.5.11 On Hilton Lane (west of the Scheme) there is likely to be one property that experiences both minor changes in NO_2 concentrations and moderate noise increases (significant). The combined effects would be noteworthy but are unlikely to be significant (slight adverse), however, significant effects in relation to traffic derived noise would remain (as reported in Chapter 11: Noise and Vibration). For other properties, there would not likely be any significant combined effects.

15.5.12 Significant beneficial noise effects have been predicted for 18 properties located off the A460 Cannock Road, Featherstone, and significant adverse visual effects have been predicted for properties located along the same section of this road. However, it cannot be assumed that a significant beneficial effect would outweigh or balance a significant adverse effect. Therefore, a worst case approach has been adopted and a medium adverse (significant) visual effect (15 years after the completion of the Scheme) remains but only in relation to one environmental aspect (i.e. visual effects). Therefore, this does not constitute a significant combined effect.

15.5.13 Neutral combined effects (not significant) have been identified for residential receptors on Hilton Lane (east of the Scheme) and all except one property west of Shareshill) Featherstone Lane, at Laney Green, along Great Saredon Road and on the A460 Cannock Road (east of Shareshill).

15.6 Assessment of cumulative effects

15.6.1 A total of six 'other developments' have been shortlisted for inclusion in the assessment of cumulative effects. These developments are listed in Table 15.1.2 in Appendix 15.1 [TR010054/APP/6.3] and include the following:

- ID 9 - The extension area for i54 Wobaston Road, identified by SSC, and application 18/00637/OUT (ID 51) which partially covers this site – an application for up to 100,000m^2 of employment development (Uses Classes B1b, B1c and B2) together with the creation of primary highway access to the i54 site, with all other matters reserved.
- ID 12 - NSIP, West Midlands Interchange (TR050005) - for an intermodal freight terminal with direct connections to the West Coast Main Line and rail served warehousing, new road infrastructure and other elements.
- Proposals relating to the ROF Featherstone Masterplan, including:
  - ID 29 - ROF Featherstone (Extension and Employment Site) identified by SSC – for 24 ha of B1 and B2 class use and 10ha of landscaping and planting within the Green Belt;
  - ID 43 - Regeneration Corridor 1 - Pendeford – Fordhouses from the Black Country Core Strategy, which is assumed to relate to a new Park and Ride site at Brinsford, connected to the ROF Featherstone Masterplan; and
  - ID 50 - Road Option 9 identified by SSC – providing access for ROF Featherstone employment site.

15.6.2 Based on the review of environmental information available for the Scheme and these 'other developments', as noted in Table 15.1.2 in Appendix 15.1 [TR010054/APP/6.3], there are not likely to be any significant cumulative effects.

15.7 Monitoring

15.7.1 In order to reduce the time over which significant adverse combined effects will occur at receptors on Hilton Lane (east of the Scheme), during operation, an appropriately sized strip of mitigation woodland would be planted at the start of the construction phase on land north of Hilton Lane, adjacent to the nearest group of properties located west of the Scheme. This will ensure that screening is realised as soon as possible, thereby, reducing the period over which combined effects will be occur. The maturation of this woodland planting should be monitored by the principal contractor, during the construction period, and remedial measures such as replacement planting should be taken if this planting is not resulting in successful growth.

15.7.2 Monitoring of the moderate adverse combined effects on one receptor at Brookfield Farm is detailed in Chapter 7: Landscape and visual, Section 7.10 as part of the monitoring of visual effects.

15.8 Summary

15.8.1 A summary of the cumulative impact assessment is presented in Table 15.1.2 in Appendix 15.1 [TR010054/APP/6.3].

15.8.2 The construction of the Scheme is likely to result in moderate adverse combined effects on residential receptors located on Hilton Lane (east and west of the Scheme), receptors located on Dark Lane and Park Road and at one receptor located at Brookfield Farm, which are considered to be significant. Landscape planting in the vicinity of the properties on Hilton Lane (east of the Scheme) will be planted at the start of construction in order to reduce the time over which this significant adverse combined effect will occur.

15.8.3 The operation of the Scheme is likely to result in moderate adverse combined effects on one receptor at Brookfield Farm which is considered to be significant. This significant adverse combined effect is likely to occur in the short to medium term as landscape planting becomes established.

15.9 References

Ref 15.1 Highways England (2019) (Design Manual for Roads and Bridges, Volume 11, Section 2, Part 4 LA 104 Environmental Assessment and Monitoring

Ref 15.2 The Planning Inspectorate (2019) Advice Note Seventeen: Cumulative Effects Assessment.

Ref 15.3 Department for Transport (2014) National Policy Statement for National Networks

Ref 15.4 Highways England (2018) M54-M6 Toll Link Road PCF Stage 3 EIA Scoping Report

Ref 15.5 South Staffordshire Council (2018) Site Allocations Development Plan Document 2018

Ref 15.6 Walsall Council (2019) Site Allocations Development Plan

Ref 15.7 Cannock Chase District Council (2018) Strategic Housing Land Availability Assessment (SHLAA) 2019

Ref 15.8 Cannock Chase District Council (2018) Employment Land Availability Assessment (ELAA) 2018

Ref 15.9 Dudley Metropolitan Borough Council. Sandwell Metropolitan Borough Council, Walsall Council, Wolverhampton City Council (2011) Black Country Core Strategy

Ref 15.10 Wolverhampton City Council (2019) Strategic Housing Land Availability Assessment

Ref 15.11 Amey Consulting (2018) Option Assessment Framework Report: Option 7 and 9 ROF Featherstone

Ref 15.12 Colliers International and Mott MacDonald (2013) ROF Featherstone Viability and Delivery Study Options Stage 1

Ref 15.13 AECOM (2018) i54 Western Extension (south) Environmental Statement

Ref 15.14 Ramboll (2018) The West Midlands Rail Freight Interchange Order 201X Environmental Statement