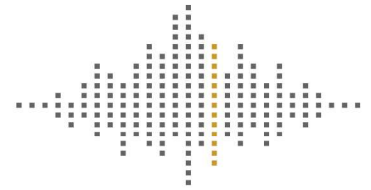


SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report 1

ES Volume 2: Appendix 9.2

Noise Technical Report –
Road Traffic Noise

Northern Gateway JPA 1.1

Prepared by

Sam Moran BEng(Hons) MIOA

Gary King MIOA MCIEH

Date 23rd April 2025

Project No 2422280

North England

Sharps Redmore

The Plex, 15 Margaret Street,
Wakefield, WF1 2DQ

T 01924 586468

E northengland@sharpsredmore.co.uk

W sharpsredmore.co.uk

Regional Locations

North England,
South England (Head Office),
South West England,
Wales, Scotland

Sharps Redmore Partnership Limited

Registered in England No. 2593855

Directors

RD Sullivan BA(Hons), PhD, CEng, MIOA, MAAS, MASA;

KJ Metcalfe BSc(Hons), MIOA;

N Durup BSc(Hons), MSc, PhD, CEng, FIOA, MInstP, MASA, MAES;

GJ King MIOA, MCIEH

Company Consultant

TL Redmore BEng, MSc, PhD, MIOA



Contents

- 1.0 Introduction
- 2.0 Assessment Methodology and Criteria
- 3.0 Survey Details
- 4.0 Assessment Details
- 5.0 Outline Mitigation Measures
- 6.0 Conclusion

Appendices

- A. EIA Assessment Plan
- B. Acoustic Terminology
- C. Basic Noise Level Summary Calculation Tables
- D. Figures

This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

1.0 Introduction

- 1.1 This Appendix sets out the legislation, policy, guidance and methodology relevant to the assessment of likely significant road traffic noise effects associated with the Project for Assessment. Where there are inter-related descriptions and assessment of effects associated with the Project for Assessment and the Proposed Scheme, these are considered under the umbrella of the Project for Assessment.
- 1.2 The assessment includes the change in road traffic noise along the local and strategic road network within the area around the Assessment Boundary as well as along Moss Hall Road which traverses through a broadly central part of the Assessment Boundary.
- 1.3 The assessment includes the consideration of potential highway infrastructure works within the Potential Infrastructure Plots AAA-CCC. As the Project for Assessment is outline with all matters reserved, there are no fixed details of proposed highway infrastructure works. Assessments of new or altered highways infrastructure in these areas would be delivered by 3rd parties and subject to separate planning applications. On this basis a proportionate assessment of potential effects associated with such works has been undertaken at this stage. Preliminary early stage design information have been provided for Potential Infrastructure Areas AAA and BBB which are indicative only and have been provided in confidence. Works in these areas could be different in scale and location to information which are currently available. However, in the absence of details associated with a more advanced assessment stage, the information provides the opportunity to present a 'snapshot' to enable reasonable assumptions to be made for a proportionate assessment to be undertaken at this stage. The works considered as part of access arrangement is presented in the Transport Assessment and is briefly summarised as follows:
 - Potential Infrastructure Area AAA – The area from the Three Arrows junction of Pilsworth Road / Moss Hall Road required for access / junction improvements, Pilsworth Road improvement works extending to the M66 Junction 3 and the area of potential M66 Junction 3 improvement works. It is understood that improvement works to M66 comprise smaller scale improvement incorporating active travel facilities. Initial phases will utilise highway infrastructure that already exists and will include these local highway improvements which are as the 'western links';
 - Potential Infrastructure Area BBB – New M62 Motorway Access Mitigation [Referred to hereon in as 'M62 MAM']: The area immediately north and south of the M62 which may be required for the remodelling/improvement works; and
 - Potential Infrastructure Area CCC – A potential future vehicular connection between the South Heywood Masterplan Area and the wider JPA1.1 Allocation Site. The Applicant has no control over the land necessary to deliver the connection and no primary design details are available. This potential access is not required for the Proposed Scheme; however, a proportionate sensitivity test has been undertaken as part of this assessment as it is being considered as part of the access strategy for the Project for Assessment.
- 1.4 Assumptions and limitations made within the following assessment are presented in Section 3.

- 1.5 The following assessment includes the existing Moss Hall Road and Whittle Lane which traverse through the Project for Assessment as these routes are existing highways. The assessment of road traffic noise along new internal access routes within the Project for Assessment has been considered separately and are assessed within Appendix 9.1.
- 1.6 As presented in the Scoping Report (Appendix 2.1) an assessment of vibration effects has been scoped out.

2.0 Relevant Standards and Guidance

Legislation

Land Compensation Act 1973

- 2.1 Part I of the Land Compensation Act 1973 (LCA) provides a means by which compensation can be paid to owners of land or property due to a loss in value of these assets caused by public works, such as new or improved railways and roads. Noise and vibration are two of the factors which would be considered in any claims for compensation, but the claim should consider all changes and effects, including betterment.

The Noise Insulation Regulations 1975, as amended 1988

- 2.2 The Noise Insulation Regulations 1975 were made under Part II of the Land Compensation Act 1973. Regulation 3 imposes a duty, and Regulation 4 a discretionary power, on the relevant Highway Authority to undertake or make a grant in respect of the cost of undertaking noise insulation work in eligible buildings affected by a new or altered highway. This is subject to meeting a range of criteria on road traffic noise levels as specified in the regulations.
- 2.3 To be eligible for a grant due to increased road traffic noise levels, the dwelling must be within 300m of the nearest point of the carriageway of the highway and the road traffic noise level at the dwelling after the work must be:
- Above a façade level of $L_{A10,18\text{hours}}$ 68dB;
 - Be at least 1dB(A) greater than the prevailing noise level immediately before the work; and
 - The noise level from the highway, additional carriageway, or alteration must contribute at least 1dB(A) to the relevant noise level at the receptor.

Environmental Noise (England) Regulations 2006 implementing Environmental Noise Directive 2002/49/EC

- 2.4 This Directive relates to the assessment and management of environmental noise in EU member states and requires noise action plans to be developed on a five-year rolling programme. The action plans aim to prevent and reduce environmental noise and its harmful effects on human health, preserve environmental noise quality where it is good, manage noise issues and effects and protect quiet areas against an increase in noise.
- 2.5 Noise Important Areas are defined in the strategic noise map as where the 1% of the population that are affected by the highest noise levels from roads or major railways are located according to the results of the strategic noise mapping.

Guidance

DMRB LA111

- 2.6 The recommended approach for the assessment of noise from a new road scheme is set out in DMRB LA111. LA111, provides, *“a framework for assessing and managing the noise and vibration effects associated with construction, improvement, use and maintenance of motorways and all purpose trunk roads.”*

2.7 LA111 recommends that the noise level resulting from the use of a new road scheme is considered against the level which would exist in the absence of a new road scheme. It recommends that the opening year and a future year are considered, where the future year is generally taken to be 15 years after opening, but is intended to represent the year with the greatest increase after opening. The assessment method requires that three scenarios are assessed, being:

1. The “Do Minimum Opening Year” (DMOY) noise compared to the “Do Something Opening Year” (DSOY) noise. The results from this may be used to provide a prediction of the “short term” magnitude of change, which enable a prediction of the significance of any adverse noise effect. The short term is referred to as being as being the noise change based on the parallel assessment year (for example DMOY against DSOY) with the opening year being the first year in operation.
2. The “Do Something Future Year” (DSFY) noise compared to the “Do Minimum Opening Year” (DMOY) noise. The results from this may be used to provide a prediction of the “long term” magnitude of change. The long term is referred to as being the noise change based on the +15 year assessment (for example DMOY against DSFY).
3. The “Do Minimum Future Year” (DMFY) noise compared to the “Do Minimum Opening Year” (DMOY) noise.

Calculation of Road Traffic Noise

- 2.8 Calculations to predict levels of road traffic noise have been undertaken using the ‘*Calculation of Road Traffic Noise*’ (CRTN), published in 1988 by the former Department of Transport and The Welsh Office.
- 2.9 CRTN sets out standard procedures for calculating noise levels from road traffic. The calculation method uses a number of input variables, including traffic flow volume, average vehicle speed, percentage of heavy goods vehicles, type of road surface, site geometry and the presence of noise barriers or acoustically absorbent ground, to predict the $L_{A10,18\text{hours}}$ or $L_{A10,1\text{hour}}$ noise level for any receptor point at a given distance from the road.
- 2.10 CRTN applies a correction for roads with a flow of less than 4,000 vehicles per 18 hours or less than 200 vehicles per hour. The correction is only application where the slant distance between the receptor point and effective source position is less than 30m. For a lower threshold where flows of less than 1,000 vehicles per 18 hours or flows below 50 vehicles per hour the CRTN calculation method is unreliable.

3.0 Approach and Methodology

- 3.1 LA111 provides a methodology to assess the magnitude of change in both the short term and the long term. The guidance also provides a methodology to take into account local circumstances as contextual considerations in the short term scenario which feed into the judgement of the significance of effect.
- 3.2 With regard to effects associated with large scale developments which would be phased over a large number of years, it is considered that the assessment in the long term scenario would typically represent the most relevant assessment scenario. This would be due to the introduction of traffic over a progressive period on the road network as phases are built out.
- 3.3 However, with the introduction of M62 MAM, it is considered likely that the short term scenario would also be relevant. To present a robust approach, effects in both the short term and long term are considered.
- 3.4 A further requirement of LA111 is to incorporate design mitigation into the assessment. However, the design of works in the Potential Infrastructure Areas is outside of the control of the Applicant. As such it is not feasible to incorporate Primary Mitigation measures within the assessment. On this basis a proportionate assessment of potential effects associated with such works has been undertaken. It should be noted that the consideration of infrastructure works within the Potential Infrastructure Areas is for information only as these areas do not form part of the Application for the Proposed Scheme.
- 3.5 Road traffic data for roads around the Project for Assessment have been supplied by the traffic consultant for the project. The data has been supplied with (Do Something (DS)) and without (Baseline and Do Minimum (DM)) traffic generated by the Project for Assessment so that its effect on existing road traffic noise levels can be determined. 18hr Annual Average Weekday Traffic (AAWT) and 8 hour AAWT night-time traffic flow data has been provided including the proportion of HGV's and traffic speeds.
- 3.6 The links correspond to the spatial scope of the study area for the Transport Assessment. Following dialogue with the transport consultants, professional judgement has been used to establish the links for which data was to be provided was agreed to enable a manageable and meaningful assessment.

Assessment Scenarios

- 3.7 It is currently understood the Project for Assessment will commence construction in 2026 with full build out by 2045 anticipated. Therefore, a series of scenarios have been assessed which are considered to represent a proportionate series of key stages and assessment years. The primary rationale is that, in addition to assessing the opening year of the M62 MAM, a 2032 assessment year would also represent a reasonable scenario to take into account an assessment year towards the front end of what will be a phased development. The inclusion of the 2047 assessment year corresponds to the future assessment year defined in LA111 (15 years after opening) that would be considered required to be assessed with regard to the M62 MAM.
- 3.8 Table 3.1 presents the assessed short term and long term assessment scenarios along with a rationale as to why the assessment years have been chosen. Reference is also provided with regard to whether Basic Noise Level (BNL) calculations and / or noise modelling has

been undertaken. The BNL is the measure of source noise from traffic using a road as defined by the methodology stated in CRTN. This allows a basic comparison between the change in source noise level between different scenarios on a given link.

3.9 To aid the discussion of the assessment scenarios adopted, the following aspects have been included in the calculations and modelling:

- All DS scenarios consider traffic flows associated with the Project for Assessment.
- Access mitigation options including improvements at the Three Arrows junction, Fowler Welch junction and the M66 J3 active travel improvements are included in all scenarios. This is with the exception of the Baseline scenario. With regard to the short term, it is considered that a more stringent assessment is presented as, due to traffic being introduced to the road network on a gradual basis, effects would be considered to be medium term. However, there is no standard guidance which enables a direct assessment in the medium term.
- In the 2032 assessment year, scenarios for the 'with' and 'without' the M62 MAM have been assessed. This year represents the opening year for the M62 MAM. For all long term DS scenarios, the M62 MAM has been included as being present.
- The assessment method includes the assessment of the Do Minimum (DM) compared to the Do Something (DS) in the short term and long term scenarios which correspond to the guidance provided within LA111.
- Sensitivity tests have been undertaken to consider the impact of the Project for Assessment in isolation without the introduction of committed development traffic flows (Referred to as 2024 Base v 2024 With Dev). Typically, assessment would be based on a comparison between the DM and DS scenarios with the DM scenario incorporating committed development flows. However, this enables a sensitivity test of the Project for Assessment in isolation if other committed developments do not come forward. This is considered to represent a reasonable worst case scenario.
- A further sensitivity test has been undertaken to enable an assessment of a potential vehicular access in Potential Infrastructure Area CCC. Traffic data is available in the 2039 assessment year for scenarios with and without an access point onto South Heywood Link Road at Hareshill Road¹. Given the phased approach of the Project for Assessment, it is considered reasonable to consider this assessment scenario in the long term.
- The provided 2047 traffic data includes traffic flows associated with JPA 1.2². This is considered to present a reasonable worst case scenario in the long term inclusive of both JPA 1.1 and JPA 1.2 which will be phased developments. Traffic data for separate DS scenarios 'with' and 'without JPA 1.2 have been provided for the 2032 and 2039 assessment years. Following a review, there are negligible differences between the with and without JPA 1.2 scenarios (less than +/- 1 dB) on all links. This

¹ For the Transport Assessment, an assessment year of 2039 was adopted. The timescales for the implementation of JPA 1.1 extend beyond 2039. However, 2039 has been identified due to the alignment with the Place for Everyone Plan period. Reference should be made to Chapter 8: Transport and Access for further details relating to the relevance of assessment years.

² The land allocated within PFE under Policy JPA1.2 (Simister / Bowlee – Northern Gateway)

reduces uncertainty in the assessment undertaken being representative of a reasonable worst-case in this regard.

- A further scenario with regard to a cumulative projects has been undertaken. A comparison of the 2024 Baseline and 2047 DS has been undertaken. This approach over-states the outcome when compared to standard assessment scenarios including the temporal difference between assessment years and incorporation of traffic associated with population growth. Therefore a worst-case is presented in this regard and, where considered relevant, professional judgement has been used to present a proportionate assessment.
- The provided traffic flow data incorporates the Nationally significant infrastructure project (NSIP) at M60/M62/M66 Simister Island Interchange ³ being in operation in all scenarios except for the 2024 Base (Without Dev).

Table 3.1 Assessment Scenarios

Short term (ST) / long term (LT)	Assessment Scenario	BNL / Noise Modelling ?	Justification
ST	2032 DM v 2032 DS (Without M62 MAM)	BNL and Modelling	ST assessment years align with LA111. (DS includes % development traffic)
ST	2032 DM v 2032 DS	BNL and Modelling	ST assessment years align with LA111 (DS includes % development traffic)
LT	2032 DM v 2047 DM	BNL and Modelling	LT assessment years align with LA111
LT	2032 DM v 2047 DS (Inclusive of JPA 1.2)	BNL and Modelling	LT assessment years align with LA111
ST	2024 Base v 2024 With Dev (Without M62 MAM)	BNL	Sensitivity test comparing the baseline in 2024 against DS with % development traffic. No committed development traffic in DS.
LT	2024 Base v 2024 With Dev (Inclusive of JPA 1.2)	BNL and Modelling	Sensitivity test comparing the baseline in 2024 against DS with full build out and JPA 1.2. No committed development traffic in DS.
LT	2024 Base v 2047 DS (Inclusive of JPA 1.2)	BNL and Modelling	Cumulative test comparing the baseline in 2024 against 2047 DS with full build out and JPA 1.2. Traffic associated with population growth and committed development are included in the DS.
LT	2032 DM v 2039 DS (Inclusive of JPA 1.2) 'without' South Heywood vehicular access compared to 'with' South	BNL	Sensitivity Test for potential future vehicular connection between the South Heywood Masterplan Area and the wider JPA1.1 Allocation Site

³ Development Consent Order(DCO): <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/TR010064> Status: Accepted for examination.

Short term (ST) / long term (LT)	Assessment Scenario	BNL / Noise Modelling ?	Justification
	Heywood vehicular access		

*Unless stated otherwise, the scenario includes the presence of the M6 MAM

** % Development traffic: includes development generated traffic corresponding to 395,000m² quantum. The 2039 DS are reflective of the maximum quantum of development as set out in Chapter 4.

- 3.10 The above scenarios are considered to represent a reasonable worst-case scenario.
- 3.11 The assessed scenarios also comply with the methodology stated within the EIA Scoping Report with the exception of the 2032 DM v 2047 DS scenario 'without' JPA 1.2. This is not considered to be of material consequence as a reasonable worst case scenario has been assessed for the corresponding scenario which is inclusive of JPA 1.2.

Assessment of the change in noise level on the existing local and strategic highway network

- 3.12 Basic Noise Level (BNL) calculations have been undertaken to establish the magnitude of change on all links within the study area. The calculation reflect a notional receptor location 10 metres from the edge of each carriageway. This enables an assessment of any given receptor along the particular road considered and also forms a basis of where more detailed investigation would be appropriate. This approach enables a proportionate assessment for all links within the study area as well as, within the context of the guidance provided within LA111, provides an initial screening exercise with regard to the extent of an appropriate study area associated with noise modelling.
- 3.13 The magnitudes of noise changes are determined according to Tables 3.2 and 3.3 below for short term (opening year) and long term (future year) effects respectively. For clarity, the changes could be either positive or negative in which case the effects could be either adverse or beneficial.

Table 3.2: Short term magnitude of changes in road traffic noise level – from LA 111

Short term magnitude*	Short term noise change (dB LA10,18hr or L _{night})
Major (or large)	Greater than or equal to 5.0
Moderate (or medium)	3.0 to 4.9
Minor (or small)	1.0 to 2.9
Negligible	less than 1.0

*Reference to large, medium and small corresponds to the terminology in the ES Chapter

Table 3.3: Long term magnitude of changes in road traffic noise level – from LA 111

Long term magnitude*	Long term noise change (dB LA10,18hr or L _{night})
Major (or large)	Greater than or equal to 10.0
Moderate (or medium)	5.0 to 9.9
Minor (or small)	3.0 to 4.9
Negligible	less than 3.0

*Reference to large, medium and corresponds to the terminology in the ES Chapter

Assessment of Potential Infrastructure Areas

- 3.14 Whilst details associated with works in Potential Infrastructure Areas are unknown at this stage, it is assumed that larger scale remodelling/improvement works are most likely to be associated with the M62 MAM. As such it is considered likely that an assessment in accordance with the guidance provided within LA111 would be undertaken as part of a planning applications undertaken by 3rd parties. A proportionate assessment has been undertaken with regard to the methodology provided within LA111 where considered feasible at this stage.
- 3.15 For works around M66 J3 and along Pilsworth Road to the east (known as 'The Western Access Works') in Potential Infrastructure Area AAA, the proposals are understood to include incorporating comparatively smaller scale active travel facilities. It is expected that the scope of a planning application undertaken by 3rd parties would include liaison with statutory consultees to inform the assessment methodology. A proportionate assessment has been undertaken to consider these works within the ES.
- 3.16 In terms of operational study area, LA111 states that *'the following can be sufficient for most projects, but it can be reduced or extended to ensure it is proportionate to the risk of likely significant effects:*

Note 1:

1) the area within 600m of new road links or road links physically changed or bypassed by the project;

2) the area within 50m of other road links with potential to experience a short term BNL change of more than 1.0dB(A) as a result of the project.

Note 2

Variations in the study area can be defined for individual projects".

- 3.17 LA111 provides defined values representing the LOAEL and SOAEL for road traffic noise, as shown in Table 3.4 below. LA111 does not state whether the values should apply to existing roads as well as new or amended roads. Many properties located within close proximity to local roads or motorways will experience noise levels above the SOAEL with or without the introduction of a new road scheme. The consideration of the SOAEL has been incorporated into the assessment with respect to local circumstances as explained in Table 3.5.

Table 3.4: LOAEL and SOAEL values recommended in LA 111

Time Period	LOAEL	SOAEL
Day (06:00-24:00)	55dB $L_{A10,18hr}$ façade	68dB $L_{A10,18hr}$ façade
Night (00:00-06:00)	40dB L_{night} , outside (free-field)	55dB L_{night} , outside (free-field)

Note: This table contains an internal inconsistency: the night time period is defined as 00:00-06:00 hours, but the parameter used is L_{night} , which is, by definition, always an 8 hour night time value (where night time is defined as 23:00 to 07:00 hours). For the purposes of this assessment night time is considered to be 23:00 to 07:00 hours to provide a consistent approach.

- 3.18 LA111 advises that the LOAEL and SOAEL values may need to be changed to take account of differing sensitivities to noise. Magnitudes of noise changes should be determined according to impact magnitude tables that equate level differences to magnitudes of effect

for both short term and long term changes. For the short term, these changes should also be considered in relation to local circumstances according to guidance specified for certain local conditions in LA111.

- 3.19 For noise sensitive receptors where the magnitude of change in the short term is minor, moderate or major at noise sensitive buildings, local circumstances, must also be considered to determine the final significance. Details of how this should be done are included Table 3.60 in LA 111, which is reproduced in Table 3.5.

Table 3.5: Determining final operational significance on noise sensitive buildings – from LA111

Local circumstances	Influence on significance judgement
Noise level change (is the magnitude of change close to the minor/moderate boundary?)	1) Noise level changes within 1dB of the top of the 'minor' range can indicate that it is more appropriate to determine a likely significant effect. Noise level changes within 1dB of the bottom of a 'moderate' range can indicate that it is more appropriate to consider a change is not a likely significant effect.
Differing magnitude of impact in the long term and/or future year to magnitude of impact in the short term	1) Where a greater impact in the long term and/or future year is predicted, it can be more appropriate to consider that a smaller change is a likely significant effect. A lower impact in the long- term and/or future year over the short-term can indicate that it is more appropriate to consider that a larger change is not significant. 2) A similar change in the long term and non-project noise change can indicate that the change is not due to the project and not an indication of a likely significant effect.
Absolute noise level with reference to LOAEL and SOAEL (by design this includes sensitivity of receptor)	1) A noise change where all do-something absolute noise levels are below SOAEL requires no modification of the initial assessment. 2) Where any do-something absolute noise levels are above the SOAEL, a noise change in the short term of 1.0dB or over results in a likely significant effect.
Location of noise sensitive parts of a receptor	1) If the sensitive parts of a receptor are protected from the noise source, it can be appropriate to conclude a moderate or major magnitude change in the short term and/or long term is not a likely significant effect. 2) An example of this would be where no windows of sensitive rooms face the road, and outdoor spaces are protected from the road by buildings. 3) Conversely, if the sensitive parts of the receptor are exposed to the noise source, it can be more appropriate to conclude a minor change in the short term and/or long term is a likely significant effect. 4) An example of this would be when a house has many windows of sensitive rooms and outdoor spaces facing the road. 5) It will only be necessary to look in detail at individual receptors in terms of this circumstance where the decision on whether the noise change gives rise to a significant environmental effect is marginal.

Local circumstances	Influence on significance judgement
Acoustic context	1) If a project changes the acoustic character of an area, it can be appropriate to conclude a minor magnitude of change in the short term and/or long term is a likely significant effect.
Likely perception of change by residents	1) If the project results in obvious changes to the landscape or setting of a receptor, it is likely that noise level changes will be more acutely perceived by the noise sensitive receptors. In these cases it can be appropriate to conclude that a minor change in the short term and/or long term is a likely significant effect. 2) Conversely, if the project results in no obvious changes for the landscape, particularly if the road is not visible from the receptor, it can be appropriate to conclude that a moderate change in the short term and/or long term is not a likely significant effect.

- 3.20 The requirement to consider the contextual local circumstance aspects associated with the guidance provided within Table 3.5 would be more appropriate and feasible to be undertaken during more advance design stages. However, where considered feasible, regard has been given to local circumstances within the assessment. This includes consideration of the absolute noise level with reference to the SOAEL in the short term.

Assumptions and limitations

- 3.21 The assessment of traffic noise is based on information provided by Tetra Tech. This was based on traffic modelling undertaken by WSP and the methodology agreed with Transport for Greater Manchester. Reference should be made to Chapter 8: Transport and Access for further details of the traffic data. This ensured an accurate representation of vehicle flows in the local area.
- 3.22 Traffic data associated with the Proposed Scheme in isolation has not been available at the time of writing. Therefore, the identified effects of the Proposed Scheme are generally reported as being the same as those for the Project for Assessment. As such the findings are likely to over-state likely affects associated with the Proposed Scheme, particularly during the long term. With regards to mitigation, recommendations relating to the Proposed Scheme and the Project for Assessment are presented separately.
- 3.23 The traffic data for the scenario's presented in Table 3.1 are based on the Non Vision Led traffic assessments (referred to in the Transport Assessment undertaken by Tetra Tech as 'Policy Off'). In the Vision Led scenario (referred to as 'Policy On' and explained in greater detail in the Transport Assessment), the vision is to achieve a reduction in vehicular traffic using private cars. Whilst potentially being of benefit in terms of a reduction in absolute noise level, the reduction in vehicular trips would be expected to be gradual over time with large changes in traffic flow required to make perceptible changes (e.g. broadly, assuming HGV percentages and vehicle speeds remain similar, a long term change in noise level of 3 dB would equate to a halving of traffic flow). It is considered unlikely that there would be discernible changes in noise if considering a 'Policy On' scenario. Therefore, it is not considered that an assessment with 'Policy On' would provide a further meaningful analysis.
- 3.24 BNL calculations follow the calculation methodology provided within CRTN as referred to within LA111 (Appendix A.1. Operation noise calculations). With regard to low flows which are applicable for receptors within 30m of the edge of a carriageway, as a proportionate

approach, corrections have not been applied on specific links which fall below the relevant low flow thresholds. However, checks have been undertaken to establish that there would be no material change to the assessment. Typically there would be a low correction to absolute predicted noise level. If this occurred in both the DM and DS scenarios, the difference in the change in noise level with or without the inclusion of a correction would be the same. For a small number of links, where low flows are present in the DM but not the DS or vice versa, these links have been reviewed along with the potential for a material change to the overall outcome. The identified links are either located within proximity to the motorways, where noise from the motorway would be dominant, or have been included in noise modelling which incorporates the low flow correction. This process has also been undertaken with respect to flows below the thresholds where CRTN indicates that the calculation methodology is unreliable.

- 3.25 The calculation methodology of CRTN is applicable between speeds of 20kph and 120 kph⁴. Therefore, on links where the provided speeds are below 20 kph, the default speed has been set to 20 kph for both BNL calculations and noise modelling.
- 3.26 For the night-time period, the changes in road traffic noise have been calculated on the same basis as the daytime calculations, but using the one hour calculation method instead of the 18 hour calculation method. The eight hour night-time traffic flows are assumed to be spread evenly across eight one hour periods, and the calculated one hour values are aggregated to determine the eight hour value.
- 3.27 The assessment of works associated with Proposed Infrastructure Areas AAA – CCC, would be delivered by 3rd parties and subject to separate planning applications. Preliminary early stage design information have been provided for Potential Infrastructure Areas AAA and BBB which are indicative only and have been provided in confidence. Works in these areas could be different in scale and location to information which are currently available. However, in the absence of details associated with a more advanced assessment stage, the information provides the opportunity to present a 'snapshot' to enable reasonable assumptions to be made for a proportionate assessment to be undertaken at this stage. No design details are available for Area CCC. On this basis a proportionate assessment of potential effects associated with such works has been undertaken.
- 3.28 A description of assumptions made for the purpose of this assessment within Potential Infrastructure Areas AAA and BBB are summarised as:
- A new junction on the M62 between J19 and the Simister Island Interchange which includes a link to J19 which traverses along the southern side of the M62.
 - Amended road alignments along the Moss Hall Road corridor from the Three arrows junction to the Fowler Welch junction and along Pilsworth Road towards M66 J3.
- 3.29 Publicly accessible 1m Lidar data has been obtained from the Department for Environment & Rural Affairs website has been used for existing ground level data used in the noise modelling.
- 3.30 No proposed ground data is available relating to potential works within Potential Infrastructure Areas AAA and BBB. Therefore, assigning new or realigned roads to existing ground levels where considered reasonable with assumptions made where there are

⁴DMRB, Volume 11, Section 3, Part 7, HD 213/11 – Revision 1, Noise and Vibration

greater variations in existing ground level to what could be reasonably considered (e.g. dips). In such situations, ground levels have been assigned to assumed road levels.

- 3.31 For Potential Infrastructure Area CCC, no preliminary details are currently available. The Application is not reliant upon an access road in this area and although this access option is less likely, an assessment has been included for completeness in a proportionate manner.
- 3.32 OS Mastermap and, on the northern periphery of the study area, OS vector mapping has been used to define the location of road carriageways and buildings within the study area.
- 3.33 Following the guidance provided within LA111 (Appendix A.2. Operation noise calculations), a correction of -1 dB has been applied to all links in the noise modelling. This is with the exception of links where speeds are greater than 75 kph where a correction of -0.5 dB has been applied for a hot rolled asphalt surface. Uncertainty in these assumptions has been reduced by review of details available with respect to the road surfaces in the noise assessment undertaken for proposed works at the M60 /M62/M66 Simister Island Interchange. The same road surfaces / corrections have applied for the DM and DS scenarios on existing / unchanged links as well as new links in the DS scenario.
- 3.34 Following an initial screening exercise, the noise model focuses on areas and receptors further to the east and north of the Simister Island Interchange. For this interchange existing highway alignments have been included in all noise models. Uncertainty in the assumptions is minimised as it has been established that the change in noise level as a result of development generated road traffic noise associated with the Project for Assessment on links around this interchange is negligible.
- 3.35 A reflective noise barrier, assumed to be 1.8m high, has been included in the noise model to represent a boundary wall which is present adjacent to residential properties located adjacent to Moss Hall Road (Represented in Table 5.6 by R8 to R10).
- 3.36 For the purpose of the road traffic noise assessment, the baseline noise levels used for the assessment of road traffic noise are those predicted by noise modelling. Noise surveys have been undertaken which enable a description of the existing noise environment present within and around the Project for Assessment to be established.

Assessment Approach

- 3.37 A summary of the proposed assessment approach and steps taken within the assessment is as follows:
 - An assessment of the change in noise level on the existing local and strategic highway network. This has been undertaken based on the calculated change in BNL on all links within the study area as a result of the Project for Assessment with reference to the magnitude of change criteria presented in Tables 3.2 and 3.3;
 - Where the BNL calculations predict a negligible change in the short term and long term, the associated link (and by virtue, receptors along those links) are scoped out from further detailed assessment unless otherwise justified;
 - The initial BNL calculations inform the requirement for a more detailed assessment including noise modelling which is based on the following methodology:

- Receptors located within 600m of the boundary of Potential Infrastructure Area BBB (as defined within LA111);
- Receptors within 50m of roads where, as a direct outcome of the M62 MAM, an increase in BNL of 1.0 dB or greater is predicted in the short term (as defined within LA111);
- Closest receptors to Potential Infrastructure Area AAA [This assessment has been included in addition to the LA111 requirements noted above]; and
- Receptors within 50m of roads where the magnitude of change in the long term is predicted to be 5.0 dB or greater. [This assessment is not defined within LA111, however, has been undertaken to consider potential Significant effects in the long term based on the magnitude of change corresponding to a moderate effect. As the Project for Assessment will be phased over a number of years, except for the assessment of the M62 MAM, it is considered that the assessment of effects in the long term would be appropriate.]

3.38 For the 2032 short term scenario which incorporates the M62 MAM being present, it would be expected that there would already be development generated traffic on the road network. Therefore, it is considered that the effects as a direct outcome of the M62 MAM in the short term would be reflected by a comparison between the change in noise level of the 2032 DMvDS (without M62 MAM) and 2032 DMvDS (with M62 MAM) – i.e. where there is a 1.0dB difference in the change in noise level between scenarios rather than a 1.0dB difference between the DM and DS scenarios.

3.39 With regard to the assessment of receptors, LA111 methodology details that an assessment at all receptors is undertaken within the spatial extent as defined in the bullet points above. However, design details are only indicative at this stage whilst LA111 also states that mitigation measures that are deemed suitable for use shall be included within the project design which is outside of the control of the Applicant. Therefore, as a proportionate approach, a sample of receptors which represent reasonable worst-case locations within the defined spatial extent have been assessed.

3.40 Further to the above, noise modelling has also been undertaken for receptors located along Castle Road that traverses over the M66 and would provide access to the Assessment Area FF (proposed residential receptors associated with the Project for Assessment). No traffic data is available on this link in the Base or DM scenarios and thus an initial screening exercise of this link would not be feasible. In reality there would be some existing vehicular movement along this road, however, it is assumed that this would be low. Traffic flows inclusive of vehicular movements associated with Assessment Area FF are only available in the longer term scenarios (2039 and 2047). However, by comparing the 2024 Base with the 2024 Base (With Development), it is considered that a reasonable worst-case scenario has been undertaken in this regard.

4.0 Baseline and Noise Sensitive Receptors

- 4.1 A baseline noise survey has been undertaken at locations within and around the Assessment Boundary with observations also made within the wider area. Details of the noise survey are presented in Appendix 9.1 and it has been identified that the baseline noise environment within the study area is principally governed by road traffic noise.
- 4.2 Residential receptors located adjacent to or within proximity to the local and strategy road network including potential Infrastructure Areas have been considered following the assessment methodology presented in Section 2.
- 4.3 In addition, LA111 provides examples of receptors which are sensitive to noise in addition to residential dwellings which includes hospitals, healthcare facilities, community facilities, international and national designated sites, public rights of way and cultural heritage assets. With specific regard to road traffic noise and vibration, LA111 does not provide a scale of sensitivity for receptors with receptors being either sensitive or not. A proportionate assessment of such receptors has been considered in the following assessment.

Noise Important Areas

- 4.4 There are a number of Noise Important Areas (NIA) located adjacent to links within the study area. Following an initial screening exercise, the majority of NIA's are located adjacent to links where the predicted change in noise level is less than 1 dB in the short term of 3 dB in the long term. NIA's within 600m of Potential Infrastructure Area BBB are listed in Table 4.1.

Table 4.1 Noise Important Areas

NIA Number	Description	Location	Noise Source Asset Owner
1715	Middleton Road, North of M62 J19	Adjacent to local road network	Rochdale Council
1411	M62 J19 east slip road	Adjacent to motorway network	National Highways
6961	Middleton Road, South of M62 J19	Adjacent to motorway and local road network	National Highways
6962	North of M62	Adjacent to motorway network	National Highways
10716	Manchester Road (A6045), South West of junction with QEII Way	Adjacent to local road network	Rochdale Council
14901	Both sides of M62 / Manchester Road (A6045)	Adjacent to motorway and local road network	National Highways
12078	Heywood Old Road, South of Potential Infrastructure Area BBB	Adjacent to local road network	Rochdale Council
6964	North of M62, adjacent to Whittle Lane	Adjacent to motorway and local road network	National Highways
6965	North of M62, further west of 6964	Adjacent to motorway and local road network	National Highways
6966	North of M62, further west of 6965	Adjacent to motorway and local road network	National Highways

5.0 Key Findings

- 5.1 The operational road traffic noise assessment has been undertaken based on the scenarios presented in Table 3.1.
- 5.2 BNL calculations have been undertaken on all links within the study area. Tables presented in Appendix C show the predicted change in noise level on all links in the short term (Tables C.1 and C.2) and long-term (Tables C.3 and C.4)⁵.
- 5.3 An aerial image of the primary links described within this assessment is presented below.

Aerial image of local and strategic highway network



Note: TA = Three Arrows; FW = Fowler Welch; MHR = Moss Hall Road; SHLR = South Heywood Link Road.

- 5.4 Further to the BNL calculations, noise modelling has been undertaken based on the method described Section 3.
- 5.5 A summary of the results of the BNL calculations and noise modelling both are presented within this Section for both the short term and long term.
- 5.6 With regard to the short term, it is considered that a more onerous assessment is presented as, due to traffic being introduced to the road network on a gradual basis, effects

⁵ For brevity, the links shown do not include circulatory links on motorway junctions as, in general, it would be expected that noise from the main carriageways would be dominant. However, where relevant these links have been included in the noise modelling and incorporated within the assessment

would be considered to be medium term. However, there is no standard guidance which enables a direct assessment in the medium term.

Change in noise level on links within study area

- 5.7 The following tables present a summary of the links where, based on the BNL calculations, minor, moderate or major effects are predicted. For all other links where the predicted change in noise level is less than 1.0 dB in the short term and less than 3.0 dB in the long term, a negligible effect is predicted. For brevity, these links are not referenced. The tables also only present adverse impacts. Where the BNL calculations show a reduction in noise level, such effects are described separately. The BNL calculations for all links are presented in Tables C.1 and C.2 in Appendix C.
- 5.8 Tables 5.1 to 5.3 summarise the magnitude of change based on the outlined short term scenarios.
- 5.9 Typically, consideration of the BNL calculations in relation to magnitude of change would relate to the daytime period. The magnitude of change in the night-time is generally proportionate to that compared to the daytime assessment period. This has been verified by a review of the night-time BNL calculations. However, where it has been identified that, due to very slight variations, the magnitude of change between the daytime and night-time periods is different, the worst-case effect in either period has been summarised.

Table 5.1 Short Term: 2032 DM v 2032 DS (Without M62 MAM)

Magnitude of change (dB $L_{A10,18\text{hours}}$ / L_{night})	Link Description
1.0 - 2.9 (Minor)	Queen Elizabeth II Way / South Heywood Link Road, from M62 J19 continuing along Hareshill Road / Pilsworth Road / Moss Hall Road adjacent to Heywood Distribution Park.
3.0 - 4.9	Moss Hall Road (Partial way down between Three Arrows Junction and Birch Industrial Estate access) Moss Hall Road (North of junction with Pilsworth Road, west of Heywood Distribution Park) Pilsworth Road (M66 J3 to junction with Moss Hall Road)
≥5	None

Table 5.2 Short Term Sensitivity Test: 2024 DM v 2024 DS (% development complete / Without M62 MAM)

Magnitude of change (dB $L_{A10,18\text{hours}}$ / L_{night})	Link Description
1.0 - 2.9	Queen Elizabeth II Way / South Heywood Link Road, from M62 J19 continuing along Hareshill Road / Pilsworth Road / Moss Hall Road adjacent to Heywood Distribution Park Moss Hall Road (North of junction with Pilsworth Road, west of Heywood Distribution Park) continuing north / Heap Brow up to junction with A58 at Heap Bridge

Magnitude of change (dB $L_{A10,18\text{hours}}$ / L_{night})	Link Description
3.0 - 4.9	Pilsworth Road (M66 J3 to junction with Moss Hall Road)
≥5	Moss Hall Road (Partial way down between Three Arrows Junction and Birch Industrial Estate access – night only)

- 5.10 In general, there is no difference in the magnitude of change on the majority of links when comparing the scenarios presented in Tables 5.1 and 5.2. This is with the exception of there being a major adverse change along Moss Hall Road opposite receptors R8 to R10) when considering the contribution of the Project for Assessment in isolation (Table 5.2) compared to a moderate change (Table 5.1). A minor adverse effect is predicted (Table 5.2) along Moss Hall Road and Heap Brow to the north of the Heywood Distribution Park compared to a negligible effect (Table 5.1).

Table 5.3 Short Term: 2032 DM v 2032 DS (With M62 MAM)

Magnitude of change (dB $L_{A10,18\text{hours}}$ / L_{night})	Link Description
1.0 - 2.9	South Heywood Link Road, Pilsworth Road adjacent to Heywood Distribution Park along Moss Hall Road / Pilsworth Road to M66 J3) from Hareshill Road continuing to the Three Arrows junction. Moss Hall Road (North of junction with Pilsworth Road, west of Heywood Distribution Park) continuing north / Heap Brow up to junction with A58 at Heap Bridge Pilsworth Road (M66 J3 to junction with Moss Hall Road)
3.0 - 4.9	Moss Hall Road (from Three Arrows Junction to Birch Industrial Estate access)
≥5	Moss Hall Road (South of Birch Industrial Estate access to potential internal access junction within Assessment Boundary)

- 5.11 Up to the opening of the M62 MAM there would be a gradual introduction of vehicles on the local and strategic road network as a result of the Project for Assessment. When comparing the two scenarios (Tables 5.1 and 5.3), generally there is no difference in the magnitude of change on links within the study area.
- 5.12 Where there have been difference in the magnitude of change identified, as well as the consideration of the opening of the M62 MAM, these are summarised as follows:
- With the M62 MAM, there are reductions in noise along the South Heywood Link Road including QE II Way and Hareshill Lane. Negligible to minor beneficial impacts (up to -1.1 dB) are predicted along this link in this short term scenario when comparing the 2032 DM and DS scenarios. When comparing the difference between the DS noise level change in the 'without' and 'with' M62 MAM scenarios, there is a difference in noise level of -2dB following the opening of the M62 MAM. However, as negligible effects are predicted in the long term 2032 to 2047 scenario, this is not considered further;
 - To the north of the Project for Assessment, along Moss Hall Road and Heap Brow, the magnitude of change is minor adverse with the M62 MAM, compared to a

negligible change without the MAM. This is considered to be an unintended consequence relating to the re-routing of traffic following the introduction of the M62 MAM. However, when comparing the difference between the DS noise level change in the 'without' and 'with' scenarios, there is a difference in noise level of less than +1.0 dB following the opening of the M62 MAM.

- A major adverse change along Moss Hall Lane / Whittle Lane to the south of the access to Birch Industrial Estate is predicted in the 2032 DS following the opening of the M62 MAM. The only receptors within close proximity to this link are two residential premises that are proposed to be demolished as a result of the Proposed Scheme. When these receptors are proposed to be demolished is unknown, however, as the development will be phased from a northerly direction, it is likely that these receptors would not be present when increases in traffic flow along this link would be expected to occur. Prior to the opening of the M62 MAM, the magnitude of change is predicted to be negligible. Therefore no further consideration has been given to receptors along this link.
- To the south of the Birch Industrial Estate, it is understood that traffic would be re-routed within the Assessment Boundary to the north of the receptors located further to the south along Whittle Lane (R11 to R13). Beyond this internal access corridor, the volume of traffic on Whittle Lane will reduce with corresponding BNL calculations indicating that minor to moderate beneficial effect would occur on Whittle Lane as it traverses over and beyond the M62 up to the junction with Manchester Road. However, there are a limited number existing dwellings along this corridor with the those present being located within close proximity to the M62. As there is a low level of traffic along Whittle Lane, it is unlikely that there would be beneficial impacts. However, these receptors are included in the noise modelling exercise and as such effects at these receptor locations will be quantified in more detail.

5.13 Tables 5.4 to 5.7 present a summary of the magnitude of change in the long term. All DS scenarios assume that the M62 MAM has been constructed and is open.

Table 5.4 Long Term: 2032 DM v 2047 DS (With M62 MAM)

Magnitude of change (dB LA10,18hours / Lnight)	Link Description
3.0 - 4.9 (Minor)	Moss Hall Road (Partial way down between Three Arrows Junction and Birch Industrial Estate access) Moss Hall Road / Pilsworth Road (North of Three Arrows junction with Pilsworth Road, west of Heywood Distribution Park) and Heap Brow (north of Bury Old Road and up to junction with A58 at Heap Bridge) Pilsworth Road (M66 J3 to junction with Moss Hall Road)
5.0 - 9.9 (Moderate)	Moss Hall Road (Partial way down between Three Arrows Junction and Birch Industrial Estate access following on to internal primary access junction within Assessment Boundary)
≥10 (Major)	None

- 5.14 In general the magnitude of change in the long term is comparable to that established in the short-term (represented by Table 5.3). This is with the exception that no major adverse effects are predicted.

Table 5.5 Long Term Sensitivity Test: 2024 DM v 2024 DS (Full Development Plus JPA 1.2 / With M62 MAM)

Magnitude of change (dB LA10,18hours / Lnight)	Link Description
3.0 - 4.9	Moss Hall Road / Pilsworth Road (North of Three Arrows junction, west of Heywood Distribution Park) and Heap Brow (north of Bury Old Road and up to junction with A58 at Heap Bridge) Pilsworth Road (M66 J3 to junction with Moss Hall Road)
5.0 - 9.9	Moss Hall Road (North of junction with Pilsworth Road) and Heap Brow (north of Bury Old Road and up to junction with A58 at Heap Bridge – night-time only) Moss Hall Road (From Three Arrows Junction and Birch Industrial Estate access following on to potential internal access junction within Assessment Boundary)
≥10	None

- 5.15 In addition to the long term sensitivity test presented in Table 5.5, a comparison of the 2024 Base v 2047 DS has been undertaken as a cumulative assessment. The established magnitude of change, generally corresponds to the summary presented in Table 5.5. This is with the exception of Moss Hall Road (North of the junction with Pilsworth Road) and Heap Brow. On these links, the magnitude of change either remains the same or reduces.

- 5.16 As a summary of the results of the BNL calculations and assessment is:

- There are a large number of roads where effects in the short term and long term are negligible. In summary, such effects are predicted along; the M62, M66 and M60 motorways; roads to the west of M66 J3 (with the exception of Castle Road as explained previously); roads leading off the SHLR to the north east including Manchester Road (A6045); roads to the north of M62 J19 including Middleton Road; and roads to the south of the Project for Assessment towards Simister including Manchester Road (A6045). Significant adverse effects are not predicted at receptors within proximity to these links and no further assessment of these links has been undertaken.
- Minor adverse effects are predicted along the SHLR corridor (Queen Elizabeth Way, Hareshill Road and Pilsworth Road) in the 2032 short term scenario without the M62 MAM. For the with M62 MAM scenario, short term effects reduce to negligible to minor beneficial. In the long term, effects are negligible. Significant adverse effects are not predicted at receptors within proximity to these links and no further assessment of these links has been undertaken.
- Along Moss Hall Lane and Heap Brow to the north of the Project for Assessment, minor adverse changes are predicted in the short and long term for all assessed scenarios. This is with the exception of the 2032 short term scenario with the M62 MAM where the magnitude of change increases from negligible to minor. With

regard to the 2024 sensitivity test of the Project for Assessment in isolation, a moderate adverse change is predicted (during the night-time) in the long term scenario. Therefore, further assessment has been undertaken along this corridor.

- Along Moss Hall Road at receptors R8 to R10, the magnitude of change is up to major adverse in this short term and up to moderate adverse in the long term. Therefore, further assessment has been undertaken along this corridor.
- Following the opening of the M62 MAM, a major adverse change in the short term and moderate adverse change in the long term is predicted along Moss Hall Lane / Whittle Lane to the south of the access to Birch Industrial Estate. There are two residential premises along this link. However, the change aligns with the introduction of the M62 MAM and due to phasing the increase in traffic along this link is assumed to occur once these receptors are not present. Therefore no further assessment has been undertaken.

- 5.17 Further to the scenarios presented above, a sensitivity test associated with a potential future vehicular connection between the South Heywood Masterplan Area and the wider JPA1.1 Allocation Site within Potential Infrastructure Area CCC has been undertaken. BNL calculations have been undertaken on all links comparing the 2032 DM v 2039 DS with separate scenarios considered 'without' and 'with' an access present.
- 5.18 On virtually all links, the difference in the BNL change between the two DS scenarios is less than 1 dB which is a negligible effect. This is within the exception of Hareshill Road (between the access and Pilsworth Road) where a +1.3 dB increase is predicted. On this link, the predicted change between the 2032 DM and 2039 DS is +1.6 dB which is a negligible change in the long term. Therefore, should this access option come forward in the future, effects would be Not Significant.
- 5.19 Further to the above, the BNL calculations on all links feeding into the Simister Island Interchange show a negligible change between all DM and DS scenarios. This is also generally relevant within the interchange with a small number of exceptions. In both the 2024 sensitivity test and the 2024 v 2047 DS, a minor adverse change in BNL is predicted on part of M66 south bound carriageway which traverses through the interchange between slips (after west to south slip connection). This is as a result of the proposed remodelling works at Simister Island, with negligible changes on adjacent sections of the carriageway and the direction of flow not corresponding to the Project for Assessment. A magnitude of change around the boundary of negligible / minor adverse (+3.1dB) is also shown on the M60 southbound on slip (south of M62 / M66 junction) in the 2024 With Dev and 2047 DS scenarios (compared to negligible in all other scenarios). However, this slip road has a much lower volume of traffic than main carriageways whilst, as stated previously, the adopted methodology over-states the outcome. Also, essential mitigation will be incorporated in the Simister Island works including the implementation of a low noise road surface. This would be a factor in reducing noise levels which is not taken into account within a direct BNL comparison. It is therefore considered reasonable to conclude that the magnitude of change at receptors around the interchange would be negligible as represented by the BNL calculations of links feeding into the interchange. In addition, as a further point of context, the noise assessment that accompanied the DCO application for the proposed Simister Island works, which included essential mitigation within the scheme design, established that negligible effects are predicted for that scheme in the long term. Therefore, Significant adverse effects are not predicted and no further consideration has

been given to cumulative effects associated with the proposed Simister Island infrastructure works.

Road Traffic Noise Modelling

5.20 The results of the noise modelling exercise is presented as follows and is based on the outlined methodology which includes:

- Representative receptors within 600m of the Potential Infrastructure Assessment Area BBB;
- Reasonable worst-case receptors along Moss Hall Road / Heap Brow (R1 to R4) and a single receptor along Pilsworth Road (R5) to the north of the Potential Infrastructure Assessment Area AAA [With the exception of Castle Road, the magnitude of change on road links to the west of the M66 are negligible and these links have been screened out];
- Reasonable worst-case receptors along Castle Road (R6 and R7). The receptors have been chosen to include; a representative receptor location on the northern side of Castle Road (R6); and a representative receptor location (R7) on the southern side of the road. This is due to the expected contribution of the M66 to be lower due to building orientation / screening and thus the change expected in relation to the Project for Assessment would be expected to be greater.

5.21 As a proportionate assessment, selected reasonable worst-case receptors within the noise model study area are presented in Table 5.8. The receptor locations are also presented on Figure 9.3 in Appendix D.

Table 5.8: Road Traffic Noise Modelling Receptor Locations

Receptor Reference	Description
TR1	2 Lord Street
TR2	Spring Hill (Off Heap Brow)
TR3	25 Moss Hall Road
TR4	Brook Cottage Moss Hall Road
TR5	Jackson Fold Farm (Pilsworth Road between M66 J3 and Moss Hall Road)
TR6	7 Castle Road
TR7	16 Castle Road
TR8	Whippletree Cottage (Moss Hall Road within Assessment Boundary)
TR9a	Birch Cottage – eastern / northernmost cottage (within Assessment Boundary)
TR9b	2 The Boskins, Moss Hall Road (within Assessment Boundary)
TR9c	1 The Boskins, (Moss Hall Road within Assessment Boundary)
TR9d	Birch Cottage – westernmost cottage (Moss Hall Road within Assessment Boundary)
TR10	Bungalow, Coal Pits Farm (Moss Hall Road within Assessment Boundary)
TR11	Whittle Cottage (Off Whittle Lane)
TR12	Whittle Croft Cottage (Off Whittle Lane)
TR13	Whittle Fold Farm
TR14	The Grange (Off Whittle Lane)
TR15	Old Barn House (Off Whittle Lane)
TR16	747 Manchester Road
TR17a	763 Manchester Road

Receptor Reference	Description
TR17b	Dwelling at Top O' Th' Hill (Off Manchester Road
TR18	Siddal Farm
TR19	Farmstead off Middleton Road / Hollin Lane
TR20	278 Middleton Road
TR21	270 Middleton Road
TR22	266 Middleton Road
TR23	202 Middleton Road
TR24	212 Middleton Road
TR25	203 Middleton Road
TR26	18 Worthington Road
TR27	34 Worthington Avenue
TR28	216 Middleton Avenue
TR29	249 Manchester Road
TR30	Doctor Fold Farm, Doctor Fold Lane
TR31	Lower Whittle Farmhouse

5.22 The predicted noise levels and associated magnitude of change in the short term is presented in Tables 5.9 and 5.10 for both daytime and night-time periods.

Table 5.9: Short term magnitude of change summary: Daytime ($L_{A10,18\text{hours},\text{facade}}$)

Ref	Predicted Noise Level dB $L_{A10,18\text{hours},\text{facade}}$			Difference (dB)		Magnitude of change	
	2032 DM	2032 DS (Without M62 MAM)	2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)
TR1	61.0	61.4	62.0	0.4	1.0	Negligible	Minor A
TR2	68.0	68.4	69.5	0.4	1.5	Negligible	Minor A
TR3	68.6	69.6	70.0	1.0	1.4	Minor A	Minor A
TR4	68.0	69.0	69.5	1.0	1.5	Minor A	Minor A
TR5	63.0	63.8	63.6	0.8	0.6	Negligible	Negligible
TR6	62.4	62.5	62.1	0.1	-0.3	Negligible	Negligible
TR7	58.9	59.2	58.8	0.3	-0.1	Negligible	Negligible
TR8	59.0	63.0	61.6	4.0	2.6	Moderate A	Minor A
TR9a	59.3	63.6	62.2	4.3	2.9	Moderate A	Minor A
TR9b	63.0	67.1	65.8	4.1	2.8	Moderate A	Minor A
TR9c	60.8	65.0	63.6	4.2	2.8	Moderate A	Minor A
TR9d	63.0	67.1	65.9	4.1	2.9	Moderate A	Minor A
TR10	55.1	58.5	57.4	3.4	2.3	Moderate A	Minor A
TR11	68.2	68.0	67.6	-0.2	-0.6	Negligible	Negligible
TR12	73.7	73.6	73.8	-0.1	0.1	Negligible	Negligible
TR13	66.7	66.7	66.7	0.0	0.0	Negligible	Negligible
TR14	65.8	65.6	66.4	-0.2	0.6	Negligible	Negligible
TR15	61.7	61.6	63.0	-0.1	1.3	Negligible	Minor A
TR16	61.7	61.6	63.2	-0.1	1.5	Negligible	Minor A
TR17a	63.6	63.5	64.4	-0.1	0.8	Negligible	Negligible
TR17b	67.5	67.5	68.5	0.0	1.0	Negligible	Minor A
TR18	59.7	59.7	60.0	0.0	0.3	Negligible	Negligible
TR19	62.9	62.9	63.6	0.0	0.7	Negligible	Negligible
TR20	69.6	69.9	70.2	0.3	0.6	Negligible	Negligible
TR21	67.5	67.7	68.2	0.2	0.7	Negligible	Negligible
TR22	72.4	72.8	72.8	0.4	0.4	Negligible	Negligible
TR23	65.0	65.5	65.7	0.5	0.7	Negligible	Negligible
TR24	62.5	63.0	63.2	0.5	0.7	Negligible	Negligible
TR25	72.1	72.3	72.0	0.2	-0.1	Negligible	Negligible
TR26	71.0	71.1	71.0	0.1	0.0	Negligible	Negligible
TR27	75.1	75.1	75.1	0.0	0.0	Negligible	Negligible

Ref	Predicted Noise Level dB L _{A10,18hours,facade}			Difference (dB)		Magnitude of change	
	2032 DM	2032 DS (Without M62 MAM)	2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)
TR28	66.5	66.9	66.9	0.4	0.4	Negligible	Negligible
TR29	61.6	62.0	61.9	0.4	0.3	Negligible	Negligible
TR30	75.2	75.2	75.1	0.0	-0.1	Negligible	Negligible
TR31	62.9	62.8	63.7	-0.1	0.8	Negligible	Negligible

*Notation 'A' refers to adverse effects

The corresponding terminology in the ES Chapter is as follows in brackets: Major (large), Moderate (medium) and Minor (small)

Table 5.10: Short term magnitude of change summary: Night-time (L_{night,freefield})

Ref	Predicted Noise Level dB L _{night,freefield}			Difference (dB)		Magnitude of change	
	2032 DM	2032 DS (Without M62 MAM)	2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)
TR1	49.9	50.5	50.8	0.6	0.9	Negligible	Negligible
TR2	55.1	55.5	56.7	0.4	1.6	Negligible	Minor A
TR3	55.2	56.2	57.1	1.0	1.9	Minor A	Minor A
TR4	54.5	55.5	56.4	1.0	1.9	Minor A	Minor A
TR5	52.1	52.8	52.7	0.7	0.6	Negligible	Negligible
TR6	51.3	51.4	51.2	0.1	-0.1	Negligible	Negligible
TR7	48.1	48.6	48.3	0.5	0.2	Negligible	Negligible
TR8	48.5	51.9	51.1	3.4	2.6	Moderate A	Minor A
TR9a	48.8	52.4	51.6	3.6	2.8	Moderate A	Minor A
TR9b	51.5	56.2	54.7	4.7	3.2	Moderate A	Moderate A
TR9c	50.1	54.2	52.8	4.1	2.7	Moderate A	Minor A
TR9d	51.1	55.4	54.9	4.3	3.8	Moderate A	Moderate A
TR10	45.1	47.9	47.4	2.8	2.3	Minor A	Minor A
TR11	56.8	56.6	56.6	-0.2	-0.2	Negligible	Negligible
TR12	62.1	62.1	62.4	0.0	0.3	Negligible	Negligible
TR13	55.7	55.7	55.8	0.0	0.1	Negligible	Negligible
TR14	54.7	54.6	55.8	-0.1	1.1	Negligible	Minor A
TR15	51.0	51.1	52.6	0.1	1.6	Negligible	Minor A
TR16	51.0	51.1	52.6	0.1	1.6	Negligible	Minor A
TR17a	52.8	52.8	53.7	0.0	0.9	Negligible	Negligible
TR17b	56.5	56.5	57.5	0.0	1.0	Negligible	Minor A
TR18	49.1	49.2	49.4	0.1	0.3	Negligible	Negligible
TR19	52.3	52.5	52.9	0.2	0.6	Negligible	Negligible
TR20	58.1	58.6	58.3	0.5	0.2	Negligible	Negligible
TR21	56.8	57.4	57.3	0.6	0.5	Negligible	Negligible
TR22	61.2	61.7	61.0	0.5	-0.2	Negligible	Negligible
TR23	54.5	55.8	54.2	1.3	-0.3	Minor A	Negligible
TR24	52.2	53.4	51.8	1.2	-0.4	Minor A	Negligible
TR25	61.0	61.5	60.8	0.5	-0.2	Negligible	Negligible
TR26	59.9	60.1	59.8	0.2	-0.1	Negligible	Negligible
TR27	63.6	63.6	63.6	0.0	0.0	Negligible	Negligible
TR28	55.9	57.2	55.5	1.3	-0.4	Minor A	Negligible
TR29	51.2	51.7	50.3	0.5	-0.9	Negligible	Negligible
TR30	63.5	63.6	63.5	0.1	0.0	Negligible	Negligible
TR31	51.9	52.0	53.1	0.1	1.2	Negligible	Minor A

*Notation 'A' refers to adverse effects

The corresponding terminology in the ES Chapter is as follows in brackets: Major (large), Moderate (medium) and Minor (small)

5.23 The predicted noise levels and associated magnitude of change in the long term is presented in Tables 5.11 and 5.12 for both daytime and night-time periods.

Table 5.11 Long term magnitude of change summary: Daytime (L_{A10,18hours,facade})

Receptor Ref	Predicted Noise Level dB L _{A10,18hours}					Difference (dB)				Magnitude of change			
	2024 Base	2024 with Dev	2032 DM	2047 DM	2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS
TR1	60.6	64.7	61.0	61.2	63.5	2.9	4.1	0.2	2.5	Negligible	Minor A	Negligible	Negligible
TR2	67.6	72.4	68.0	68.1	71.1	3.5	4.8	0.1	3.1	Minor A	Minor A	Negligible	Minor A
TR3	68.7	72.3	68.6	68.7	71.7	3.0	3.6	0.1	3.1	Minor A	Minor A	Negligible	Minor A
TR4	68.1	71.8	68.0	68.1	71.1	3.0	3.7	0.1	3.1	Minor A	Minor A	Negligible	Minor A
TR5	62.3	63.6	63.0	63.1	64.3	2.0	1.3	0.1	1.3	Negligible	Negligible	Negligible	Negligible
TR6	61.9	63.0	62.4	62.7	63.7	1.8	1.1	0.3	1.3	Negligible	Negligible	Negligible	Negligible
TR7	58.5	61.4	58.9	59.4	61.9	3.4	2.9	0.5	3.0	Minor A	Negligible	Negligible	Minor A
TR8	58.5	63.1	59.0	59.1	63.0	4.5	4.6	0.1	4.0	Minor A	Minor A	Negligible	Minor A
TR9a	58.8	63.6	59.3	59.4	63.5	4.7	4.8	0.1	4.2	Minor A	Minor A	Negligible	Minor A
TR9b	62.5	67.4	63.0	63.1	67.2	4.7	4.9	0.1	4.2	Minor A	Minor A	Negligible	Minor A
TR9c	60.4	65.1	60.8	60.9	64.9	4.5	4.7	0.1	4.1	Minor A	Minor A	Negligible	Minor A
TR9d	62.5	67.5	63.0	63.0	67.3	4.8	5.0	0.0	4.3	Minor A	Moderate A	Negligible	Minor A
TR10	54.6	58.5	55.1	55.2	58.5	3.9	3.9	0.1	3.4	Minor A	Minor A	Negligible	Minor A
TR11	67.9	67.5	68.2	68.4	68.2	0.3	-0.4	0.2	0.0	Negligible	Negligible	Negligible	Negligible
TR12	73.3	73.6	73.7	74.0	74.2	0.9	0.3	0.3	0.5	Negligible	Negligible	Negligible	Negligible
TR13	66.3	66.6	66.7	67.0	67.2	0.9	0.3	0.3	0.5	Negligible	Negligible	Negligible	Negligible
TR14	65.4	66.4	65.8	65.9	67.1	1.7	1.0	0.1	1.3	Negligible	Negligible	Negligible	Negligible
TR15	61.2	62.9	61.7	62.0	63.6	2.4	1.7	0.3	1.9	Negligible	Negligible	Negligible	Negligible
TR16	61.2	62.9	61.7	61.9	63.8	2.6	1.7	0.2	2.1	Negligible	Negligible	Negligible	Negligible
TR17a	63.0	64.1	63.6	63.8	64.9	1.9	1.1	0.2	1.3	Negligible	Negligible	Negligible	Negligible
TR17b	67.0	68.2	67.5	67.8	69.0	2.0	1.2	0.3	1.5	Negligible	Negligible	Negligible	Negligible
TR18	59.2	59.7	59.7	60.0	60.5	1.3	0.5	0.3	0.8	Negligible	Negligible	Negligible	Negligible
TR19	62.3	63.2	62.9	63.2	64.0	1.7	0.9	0.3	1.1	Negligible	Negligible	Negligible	Negligible
TR20	68.5	69.4	69.6	70.3	70.6	2.1	0.9	0.7	1.0	Negligible	Negligible	Negligible	Negligible
TR21	66.8	67.6	67.5	68.0	68.7	1.9	0.8	0.5	1.2	Negligible	Negligible	Negligible	Negligible
TR22	71.2	71.7	72.4	73.1	73.0	1.8	0.5	0.7	0.6	Negligible	Negligible	Negligible	Negligible
TR23	63.7	64.1	65.0	65.5	65.3	1.6	0.4	0.5	0.3	Negligible	Negligible	Negligible	Negligible
TR24	61.3	61.5	62.5	63.0	62.7	1.4	0.2	0.5	0.2	Negligible	Negligible	Negligible	Negligible
TR25	71.5	71.5	72.1	72.6	72.4	0.9	0.0	0.5	0.3	Negligible	Negligible	Negligible	Negligible
TR26	70.5	70.7	71.0	71.4	71.5	1.0	0.2	0.4	0.5	Negligible	Negligible	Negligible	Negligible
TR27	74.7	74.8	75.1	75.4	75.6	0.9	0.1	0.3	0.5	Negligible	Negligible	Negligible	Negligible
TR28	65.2	65.5	66.5	67.0	66.7	1.5	0.3	0.5	0.2	Negligible	Negligible	Negligible	Negligible

Receptor Ref	Predicted Noise Level dB $L_{A10,18\text{hours}}$					Difference (dB)				Magnitude of change			
	2024 Base	2024 with Dev	2032 DM	2047 DM	2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS
TR29	60.5	60.0	61.6	62.1	61.2	0.7	-0.5	0.5	-0.4	Negligible	Negligible	Negligible	Negligible
TR30	74.8	74.9	75.2	75.5	75.6	0.8	0.1	0.3	0.4	Negligible	Negligible	Negligible	Negligible
TR31	62.4	63.6	62.9	63.2	64.3	1.9	1.2	0.3	1.4	Negligible	Negligible	Negligible	Negligible

*Notation 'A' refers to adverse effects

The corresponding terminology in the ES Chapter is as follows in brackets: Major (large), Moderate (medium) and Minor (small)

Table 5.12 Long term magnitude of change summary: Night-time ($L_{\text{night,freefield}}$)

Receptor Ref	Predicted Noise Level dB L_{night}					Difference (dB)				Magnitude of change			
	2024 Base	2024 with Dev	2032 DM	2047 DM	2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS
TR1	50.0	53.8	49.9	50.0	52.5	2.5	3.8	0.1	2.6	Negligible	Minor A	Negligible	Negligible
TR2	55.3	60.0	55.1	55.2	58.9	3.6	4.7	0.1	3.8	Minor A	Minor A	Negligible	Minor A
TR3	55.5	59.7	55.2	55.5	59.2	3.7	4.2	0.3	4.0	Minor A	Minor A	Negligible	Minor A
TR4	54.8	59.2	54.5	54.8	58.8	4.0	4.4	0.3	4.3	Minor A	Minor A	Negligible	Minor A
TR5	51.6	52.6	52.1	52.3	53.3	1.7	1.0	0.2	1.2	Negligible	Negligible	Negligible	Negligible
TR6	50.9	52.1	51.3	51.8	52.7	1.8	1.2	0.5	1.4	Negligible	Negligible	Negligible	Negligible
TR7	47.6	50.3	48.1	48.6	50.9	3.3	2.7	0.5	2.8	Minor A	Negligible	Negligible	Negligible
TR8	47.9	51.9	48.5	48.6	51.8	3.9	4.0	0.1	3.3	Minor A	Minor A	Negligible	Minor A
TR9a	48.2	52.4	48.8	48.9	52.4	4.2	4.2	0.1	3.6	Minor A	Minor A	Negligible	Minor A
TR9b	50.9	56.2	51.5	51.5	56.1	5.2	5.3	0.0	4.6	Moderate A	Moderate A	Negligible	Minor A
TR9c	49.5	54.2	50.1	50.2	54.1	4.6	4.7	0.1	4.0	Minor A	Minor A	Negligible	Minor A
TR9d	50.5	55.5	51.1	51.1	55.4	4.9	5.0	0.0	4.3	Minor A	Moderate A	Negligible	Minor A
TR10	44.4	48.1	45.1	45.2	48.2	3.8	3.7	0.1	3.1	Minor A	Minor A	Negligible	Minor A
TR11	56.4	56.5	56.8	57.1	57.1	0.7	0.1	0.3	0.3	Negligible	Negligible	Negligible	Negligible
TR12	61.7	62.2	62.1	62.5	62.8	1.1	0.5	0.4	0.7	Negligible	Negligible	Negligible	Negligible
TR13	55.3	55.7	55.7	56.1	56.2	0.9	0.4	0.4	0.5	Negligible	Negligible	Negligible	Negligible
TR14	54.4	55.7	54.7	55.0	56.4	2.0	1.3	0.3	1.7	Negligible	Negligible	Negligible	Negligible
TR15	50.6	52.5	51.0	51.4	53.2	2.6	1.9	0.4	2.2	Negligible	Negligible	Negligible	Negligible
TR16	50.6	52.4	51.0	51.4	53.2	2.6	1.8	0.4	2.2	Negligible	Negligible	Negligible	Negligible
TR17a	52.2	53.4	52.8	53.1	54.2	2.0	1.2	0.3	1.4	Negligible	Negligible	Negligible	Negligible
TR17b	56.0	57.3	56.5	56.8	58.0	2.0	1.3	0.3	1.5	Negligible	Negligible	Negligible	Negligible
TR18	48.6	49.2	49.1	49.5	50.0	1.4	0.6	0.4	0.9	Negligible	Negligible	Negligible	Negligible
TR19	51.6	52.6	52.3	52.7	53.4	1.8	1.0	0.4	1.1	Negligible	Negligible	Negligible	Negligible
TR20	57.1	58.1	58.1	58.5	59.3	2.2	1.0	0.4	1.2	Negligible	Negligible	Negligible	Negligible

Receptor Ref	Predicted Noise Level dB L _{night}					Difference (dB)				Magnitude of change			
	2024 Base	2024 with Dev	2032 DM	2047 DM	2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2024 Base v 2047 DS	2024 Base v 2024 With Dev	2032 DM v 2047 DM	2032 DM v 2047 DS
TR21	55.9	56.7	56.8	57.2	57.9	2.0	0.8	0.4	1.1	Negligible	Negligible	Negligible	Negligible
TR22	60.2	60.5	61.2	61.6	61.9	0.8	0.3	0.4	0.7	Negligible	Negligible	Negligible	Negligible
TR23	53.3	53.6	54.5	55.0	54.8	0.8	0.3	0.5	0.3	Negligible	Negligible	Negligible	Negligible
TR24	50.9	51.1	52.2	52.6	52.3	0.8	0.2	0.4	0.1	Negligible	Negligible	Negligible	Negligible
TR25	60.7	60.3	61.0	61.3	61.2	0.8	-0.4	0.3	0.2	Negligible	Negligible	Negligible	Negligible
TR26	59.1	59.5	59.9	60.3	60.3	0.8	0.4	0.4	0.4	Negligible	Negligible	Negligible	Negligible
TR27	62.9	63.4	63.6	64.0	64.1	0.8	0.5	0.4	0.5	Negligible	Negligible	Negligible	Negligible
TR28	54.8	54.9	55.9	56.3	56.0	0.8	0.1	0.4	0.1	Negligible	Negligible	Negligible	Negligible
TR29	50.0	49.6	51.2	51.7	50.8	0.8	-0.4	0.5	-0.4	Negligible	Negligible	Negligible	Negligible
TR30	63.1	63.2	63.5	63.9	64.0	0.8	0.1	0.4	0.5	Negligible	Negligible	Negligible	Negligible
TR31	51.5	53.1	51.9	52.3	53.7	0.8	1.6	0.4	1.8	Negligible	Negligible	Negligible	Negligible

*Notation 'A' refers to adverse effects

The corresponding terminology in the ES Chapter is as follows in brackets: Major (large), Moderate (medium) and Minor (small)

- 5.24 As can be seen in Tables 5.9 to 5.12, the magnitude of change is predicted to be negligible at a large number of receptors in both the short term and long term for all scenarios. These receptors include TR5, TR6, TR11 to TR13, TR17a, TR18 to TR22, TR25 to TR27 and TR29 to TR30.
- 5.25 TR5 is located to the north of Pilsworth Road and the Potential Infrastructure Area AAA. As the modelled DS scenario's include a re-alignment of Pilsworth Road, a sensitivity test has been undertaken using the 2024 sensitivity test traffic data based on the existing alignment of Pilsworth Road. In this scenario, a minor adverse effect is predicted (+3.2 dB). Predicted noise levels in each modelled scenario are below the SOAEL.
- 5.26 With regard to TR7 along Castle Road, it would be assumed that the build out of the residential development in Assessment Area FF would be phased over the medium term. To present a more stringent assessment, a comparison of the short term assessment criteria of the 2024 Base with the 2024 With Dev scenario which includes the full build out of the residential development has been undertaken and a minor adverse impact is predicted. With regard to the 2024 Baseline v 2047 DS cumulative test, the magnitude of change is also minor adverse although as stated previously, the adopted methodology over-states the outcome and thus a worst-case is presented in this regard.
- 5.27 At all receptors stated above, effects are predicted to be Not Significant.
- 5.28 At other selected residential receptors within the study area, there are effects which are predicted to be either moderate adverse or, during the short term, the change in noise level is greater than 1.0 dB as a result of the opening of the M62 MAM. The links where such effects are predicted to occur are described as follows.
- Along Moss Hall Road to the north of the Fowler Welch junction up to the A58 (TR1 to TR4).
- 5.29 The magnitude of change ranges from negligible to minor adverse in both the short term and long term.
- 5.30 In the short term, with regard to the introduction of the M62 MAM, when considering the difference between the predicted noise level in the 2032 DS 'without' the M62 MAM and 'with' the M62 MAM, there is a difference of 1.1 dB during the daytime and 1.2 dB during the night-time at TR2. The absolute noise level is also above the SOAEL during both daytime and night-time periods. Whilst the change is only fractionally greater than a change of 1.0dB, adhering to the LA111 guidance relating to local circumstances, this results in an effect which would be classified as being Significant.
- 5.31 A further sensitivity test has been undertaken for properties along Heap Brow and Moss Hall Road which has established that the difference in noise level is less than 1.0dB at all other dwellings. Therefore, effects which are Significant are predicted at one sensitive receptor.
- Along Moss Hall Road within the Assessment Boundary (TR8 to TR10)
- 5.32 Prior to the opening of the MAM, the magnitude of change in the short term is moderate adverse and, in the long term ranges between minor to moderate adverse depending on distance from the road.

- 5.33 'With' the M62 MAM, the magnitude of change generally reduces in the short term assessment scenario to minor adverse. In the 2024 sensitivity test, at two receptors (TR9b and TR9d which are closest to Moss Hall Road) during the night-time period, effects remaining at moderate adverse. In the long term the change is minor adverse with the exception of receptors TR9b and TR9d in the 2024 sensitivity test, where the effects are moderate adverse. Effects which are Significant are therefore predicted in the short term prior to the opening of the M62 MAM and, at two receptors, in the long term when considering the 2024 sensitivity test.

Potential Infrastructure Area BBB

- 5.34 At receptors located within closer proximity to Potential Infrastructure Area BBB, the magnitude of change ranges from negligible to minor adverse in the short term. At all receptors the magnitude of change is negligible in the long term.
- 5.35 At receptors R23, R24 and R28, following the introduction of the M62 MAM, the magnitude of change reduce from minor adverse to negligible.
- 5.36 At receptors TR14, TR15, TR16, TR17b and TR31, the magnitude of change increases from negligible to minor adverse. A difference of 1.0 dB or greater is also predicted when comparing the 'with' and 'without' M62 MAM scenarios. Predicted absolute noise levels are below the SOAEL during the daytime and night-time at TR15, TR16 and TR17. Therefore, effects which are Significant are not predicted at these receptors.
- 5.37 Predicted noise levels in 2032 DS scenario are above the SOAEL at TR14 during the night-time and, during both the daytime and night-time, TR17b. Therefore, effects which are Significant are predicted at these receptors.

Noise Important Areas

- 5.38 Table 5.13 presents an assessment at NIA's referred to in Table 4.1 in the short term. At the respective locations, the magnitude of change in the long term is predicted to be negligible. For all other NIA's in the study area, these are located adjacent to links where negligible changes in noise level are predicted in both the short term and long term.

Table 5.13 NIA's within study area

NIA Number	Predicted noise change, dB	Magnitude	Effect
1715	Less than 1 dB (BNL calculation of adjacent road link)	Negligible	Not Significant
1411	Less than 1 dB (Noise modelling, represented by TR25 & TR26)	Negligible	Not Significant
6961	Less than 1 dB (Noise modelling, represented by TR20 to TR22)	Negligible	Not Significant
6962	Less than 1 dB (Noise modelling, represented by TR30/BNL calculation of adjacent motorway link)	Negligible	Not Significant
10716	Less than 1 dB (Noise modelling, represented by TR29)	Negligible	Not Significant
14901	Less than 1 dB (Noise modelling, represented by TR30)	Negligible	Not Significant

NIA Number	Predicted noise change, dB	Magnitude	Effect
12078	Up to + 1.5 dB (Noise modelling, represented by TR15, TR16)	Minor Adverse	Not Significant
6964	Less than 1 dB (Noise modelling, represented by TR11 & TR12)	Negligible	Not Significant
6965	Less than 1 dB (Noise modelling, represented by TR13)	Negligible	Not Significant
6966	Less than 1 dB (BNL Calculation of adjacent motorway link)	Negligible	Not Significant

- 5.39 The magnitude of change is less than 1 dB in virtually all situations. A change of up to +1.5dB is predicted which represents a minor adverse effect. However, corresponding to facades where the noise change is 1.0 dB or greater, predicted noise levels are below the SOAEL at locations within the NIA's. As such an effect which is Not Significant is attributed to NIA 12078.

Other Sensitive receptors

- 5.40 The BNL calculations represent the change in noise levels at all receptors adjacent to a link, subject to a more detailed assessment where considered appropriate.
- 5.41 Following an initial screening exercise, the assessment undertaken above is based on residential receptors within the study area which represents a reasonable worst-case assessment. With regard to 'other sensitive receptors' as referred to in LA111, a proportionate assessment has been undertaken.
- 5.42 There are no nationally or internationally designated ecological sites (SSI, SPA or SAC) located within 600m of the Assessment Boundary or within 50m of affected links (i.e. links where the magnitude of change where the change in BNL is minor, moderate or major). This is also applicable to medical facilities. No schools are located within this spatial extent with the exception of Heap Village Primary School along Heap Brow. The magnitude of change along Heap Brow ranges between negligible to minor adverse, depending on the assessment scenario. When considering local circumstances in the short term, with regard to the assessment associated with the M62 MAM, the predicted noise level change following the opening on the M62 MAM in the 2032 assessment year is less than 1 dB. Therefore, significant effects are not anticipated.
- 5.43 The impact of the Project for Assessment on cultural heritage assets is reported in **ES Chapter 16: Built Heritage**. Three Grade II listed buildings are located within the road traffic study area assessed. Fountain Horse Trough is located to the north of the White Hart Inn immediately adjacent to Manchester Road (A6045) upon which the magnitude of change is negligible. The Birch-in-Hopwood War Memorial is located in a cemetery further to the east beyond Manchester Road (A6045). A change in noise level of +1.0dB is predicted when comparing the 'with' and 'without M62 MAM in 2032. This level of change is not considered that this would be of a magnitude that would be perceptible under normal conditions. The magnitude of change in the long term is negligible and it is considered that Significant effects are not predicted at these receptors. Lower Whittle Farmhouse is represented by assessments undertaken for Receptor TR31.
- 5.44 There are a number of Public Rights of Way (PRoW) located within the study area. All PRoW's across the Assessment and Application Boundaries will be extinguished and will be

replaced by a network of replacement PROW's. For PROW's outside of the Assessment Boundary, within proximity to existing and potential new links in the area, the noise environment would be principally governed by existing road traffic noise. Given the linear nature of the PROW's, the range of noise impacts along them and the transient usage of a PROW, in terms of noise a material change in the experience of using the PROW as a whole, which could affect people's health or quality of life, is not anticipated and no Significant adverse or beneficial effects on PROW's have been identified.

6.0 Outline Mitigation Measures

- 6.1 Effects which are Significant are predicted at a small number of receptors. No primary mitigation has been incorporated within the Project for Assessment with regard to operational road traffic noise.
- 6.2 The consideration of Secondary Mitigation is as follows.

Proposed Scheme

Along Moss Hall Road (R8 to R10 which are within the Application Boundary)

- 6.3 Moderate adverse effects have been identified at these receptor locations R8 to R10, depending on the assessment scenario. Therefore, measures to reduce effects are considered necessary. Mitigation measures would be subject to detailed design which would be a matter to be considered during future planning applications.
- 6.4 It is considered that to be able to facilitate a reduction in noise at these receptors, the principal option will be to increase the separation distance of Moss Hall Road from the dwellings by the re-alignment of Moss Hall Road. Potential supplementary consideration could be given to acoustic grade barriers between the road and dwellings. Given the proximity of receptors to the road and the presence of an approximate 1.8m high wall already aligning the road, it is not considered that the provision of a barrier would be a realistic measure in isolation.
- 6.5 The aim will be to, if feasible, avoid effects which are significant adverse (in terms of planning policy) and mitigate adverse effects to correspond to, depending on context, the magnitude of change being minor (based on the criteria presented in **Table 3.2** and **Table 3.3**). In determining the extent of mitigation, this should be undertaken within the context of sustainable development as required by national planning policy which must aim to achieve a balance between economic, social and environmental objectives.
- 6.6 The requirement to consider measures to reduce operational road traffic noise at these receptors can be secured by way of a planning condition.

Project for Assessment

Potential Infrastructure Area BBB

- 6.7 Assessments of noise associated with works associated with the Potential Infrastructure Area BBB would be delivered by 3rd parties and subject to separate planning applications when more detailed design information would be available.
- 6.8 The assessments would include, if required, consideration of proportionate mitigation measures. Examples of mitigation measures include:
- the provision of noise barriers to reduce the level of operational noise attributable to the associated works.
 - site layout and, for large scale works on the motorway network, road surfacing may also be a consideration.
 - Eligibility for compensation under the Noise insulation Regulations would be assessed, where applicable. With regard to the Noise insulation Regulations,

Regulation 3 imposes a duty, and Regulation 4 a discretionary power, on the relevant Highway Authority to undertake or make a grant in respect of the cost of undertaking noise insulation work in eligible buildings affected by a new or altered highway. This is subject to meeting a range of criteria on road traffic noise levels as specified in the regulations. Agreement would be sought from the Overseeing Organisations regarding the requirement for an assessment in accordance with the Noise Insulation Regulations within the context of the relevant design proposals.

- 6.9 However, various factors would be expected to be taken into account in the suitability of measures such as the number of receptors affected and the cost benefit of mitigation options within the context of the relevant policies of the Overseeing Organisations.

Along Moss Hall Road to the north of the Fowler Welch junction up to the A58 (R1 to R4).

- 6.10 There are considered to be limited options to reduce the effect. However, it is proposed that a traffic management measure would be implemented as part of the travel plan to provide signage at the (existing) Fowler Welch junction to direct HGV's to turn left along Pilsworth Road towards M66 J3. Due to the presence of Heywood Distribution Park, it would not be feasible to provide a HGV restriction along this link, however, the aim would be to seek to minimise the number of HGV trips travelling north. With the introduction of this measure, particularly given the very slight exceedance of the short term threshold which has defined a significant effect in this circumstance, it is considered that the effects would reduce to negligible. However, as this would be a management measures and not enforceable, to present a worst case a reduction in the level of effect has not been stated.

7.0 Conclusion

- 7.1 Sharps Redmore has been appointed by Northern Gateway Development Vehicle LLP (NGDV) to undertake a noise assessment in relation to a predominantly commercial project referred to as Northern Gateway JPA 1.1. This technical report is to be included within 9.2 of the ES and should be read in conjunction with Chapter 9 of the ES as well as introductory Chapters of this ES (Chapters 1 – 6). Effects associated during the construction phase have been assessed within Chapter 9 of the ES whilst a separate noise technical report is provided with regard to the assessment of sources of commercial and industrial noise as well as vehicular movement along the local road network. (Presented in Appendix 9.1 of the ES). This report presents an assessment associated with the impact of road traffic noise on the local and strategic road network including the assessment of new and amended highways within the Potential Infrastructure Areas.
- 7.2 New or altered highway infrastructure (Infrastructure Areas AAA, BBB and CCC), would be delivered by 3rd parties and subject to separate planning applications. On this basis a proportionate assessment of potential effects associated with such works has been undertaken at this stage.
- 7.3 In general, the magnitude of change on the local road network is shown to range from negligible to minor adverse and effects which are Significant are generally not predicted. With regard to effects associated with regard to large scale developments which would be phased over a large number of years, it is considered that the long term assessment scenario would typically represent the most relevant assessment scenario. This would be due the introduction of traffic over a progressive period on the road network as phases are built out. On virtually all links, and thus at receptors, effects range from negligible to minor adverse. Effects which are Not Significant are predicted for the vast majority of receptors in the long term scenario. At two receptors located closest to Moss Hall Road within the Assessment Boundary, a moderate adverse effect is predicted which represents an effect which is Significant.
- 7.4 Due to the introduction of the motorway access mitigation on the M62 (M62 MAM), proportionate further assessments have been undertaken with regard to the guidance provided within DRMB LA111 which includes the requirement to undertake an assessment in the short term. As with the long term, effects are predicted to range from negligible to, at receptors TR8 to TR10, moderate adverse in the short term. It should be noted that, at these receptors following the introduction of the M62 MAM, effects generally decrease to minor except at the closest receptors to Moss Hall Road (TR9b and TR9d) during the night-time period.
- 7.5 A further effect which is Significant, when adhering to the LA111 guidance relating to local circumstances, has been identified at one receptor along Heap Brow to the north of the Project for Assessment in the short term. This is considered to be an unintended consequence of the introduction of the M62 MAM.
- 7.6 As the design of the Proposed Scheme is progressed, options would be explored to establish whether it would be feasible to reduce road traffic noise at receptors along Moss Hall Road which are located within the Application Boundary. The mitigation measures would be subject to detailed design which would be a matter to be considered during future planning applications. The requirement to consider measures to mitigate operational road traffic noise at these receptors can be secured by way of a planning condition.

- 7.7 For highway works within Potential Infrastructure Areas, mitigation measures would be established as part of separate planning applications with example measures that could be considered included within this assessment. In the absence of defined Secondary mitigation the residual effects for residential receptors is the same as that reported in the pre-mitigation scenario.

APPENDIX A

EIA ASSESSMENT PLAN

APPENDIX B

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- A1 Noise, which is sometimes defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:
- 1 dB increase - barely perceptible
 - 3 dB increase - just noticeable
 - 10 dB increase - perceived as twice as loud
- A2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.
- A3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).
- A4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p . Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p .
- A5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.
- A6 The main noise indices in use in the UK are:
- L_{A90} : The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.
 - L_{Aeq} : The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.
 - L_{A10} : The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX} The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

- A7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB.}$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

- A8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \log_{10} \frac{160}{10} = 60 - 24 = 36 \text{ dB.}$$

- A9 Lowest Observed Adverse Effect Level (LOAEL): This is the level above which adverse effects on health and quality of life can be detected.
- A10 Significant Observed Adverse Effect Level (SOAEL): This is the level above which significant adverse effects on health and quality of life occur.

APPENDIX C

BASIC NOISE LEVEL CALCULATION SUMMARY TABLES

KEY

Colour	Magnitude of Change	Short Term (dB Change)	Long Term (dB Change)
	Major or Large (Adverse)	≥ 5.0	≥ 10.0
	Moderate or Medium (Adverse)	3.0 to 4.9	5.0 to 9.9
	Minor or Small (Adverse)	1.0 to 2.9	3.0 to 4.9
	Negligible	-0.9 to 0.9	-2.9 to 2.9
	Minor or Small (Beneficial)	-1.0 to -2.9	-3.0 to -4.9
	Moderate or Medium (Beneficial)	-3.0 to -4.9	-5.0 to -9.9
	Major or Large (Beneficial)	≤ -5.0	≤ -10.0

Note

All links included in the assessment are presented. Where there are blank cell references there is no change in noise level as either there is no traffic flow for the Base / DM or DS scenarios

Table C.1: Daytime

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
SHLR (A6045 to M62 J19)	0.9	-1.0	2.2	0.1	0.5	-0.4	-0.5	-1.0
SHLR (West of Junction with A6045 Manchester Road)	1.0	-0.8	2.3	0.3	0.4	-0.6	-0.6	-0.8
SHLR (South East of SH Employment Junction)	1.0	-0.9	2.1	0.1	0.4	-0.6	-0.6	-0.8
SHLR (South of Pilsworth Road Junction)	1.7	-0.1	2.1	0.5	0.6	0.4	0.3	1.6
Pilsworth Road (Between SHLR & Heywood Distribution Park)	2.0	0.4	2.6	1.0	0.6	1.0	1.0	0.9
Pilsworth Road (Between Heywood Distribution Park & Plot 3 Access)	1.8	1.1	2.2	0.9	0.0	1.6	1.5	0.3
Pilsworth Road (Between Plot 3 Access to 3-Arrows)	1.9	1.1	2.3	0.8	0.0	1.7	1.6	0.2
Moss Hall Road (Immediately North of 3-Arrows Junction)	3.2	3.2	4.5	4.4	0.0	3.9	3.9	3.4
M66 J3 Connector Road (East of Junction with Pilsworth Road)	1.0	0.4	1.7	1.3	0.0	1.2	1.1	0.5
Moss Hall Road (North of Junction with Pilsworth Road)	1.5	2.2	3.7	4.6	0.0	3.8	3.7	3.6
Pilsworth Road (Immediately West of M66 J3)	0.5	0.5	1.4	1.0	0.4	1.0	0.9	0.9
Moss Hall Lane (Immediately South of 3-Arrows Junction)	4.3	2.7	5.0	5.2	0.0	4.4	4.3	3.7
Pilsworth Road (Immediately North of Junction with SHLR)	0.7	0.7	2.2	0.7	0.4	1.1	1.0	1.7
Whittle Lane (West of Junction with A6045 Heywood Old Road)	-1.9	-3.1	-2.5	-3.2	-0.2	-2.2	-2.3	-2.2
A6045 Manchester Road (Immediately North East of Junction with SHLR)	0.0	0.1	0.9	0.1	0.3	0.3	0.1	0.7
A6045 Manchester Road (North of Junction with Coronation Avenue)	0.0	-0.1	1.6	0.0	-0.1	-0.1	-0.2	-0.4
A6046 Middleton Road (Immediately South of M62 J19)	0.2	0.1	1.5	0.7	0.5	0.8	0.8	0.8
Langley Lane (East of Junction with A6045)	0.0	0.0	0.3	-0.4	0.0	0.3	0.2	0.2
A6045 Manchester Road (Immediately South of Junction with Whittle Lane)	-0.1	-0.1	0.9	0.3	0.2	0.1	0.1	0.0
M62 NEB on slip (Junction 19)	1.3	-0.5	1.8	0.9	0.7	-0.3	-0.2	0.2
M62 SWB off slip (Junction 19)	1.0	-0.2	1.7	-0.3	0.3	0.5	0.3	0.3
M62 SWB on slip (Junction 19)	-0.3				0.3			
M62 NEB off slip (Junction 19)	0.1				0.6			
Jun 19 - M62 through roads SWB between slip roads	-0.1	0.1	0.5	0.1	0.1	0.3	0.3	0.2
Jun 19 - M62 through roads NEB between slip roads	0.0	0.1	0.8	0.3	0.3	0.5	0.4	0.4
QEII Way (Immediately Northwest of Jct 19)	1.1	-1.0	2.5	0.5	0.7	-0.3	-0.4	-0.9
Middleton Road (North of the Middleton Road/Coronation Avenue Junction)	0.0	-0.1	0.0	0.1	0.0	-0.1	-0.2	-0.2
Coronation Avenue (West of the Middleton Road/Coronation Avenue Junction)	0.0	-0.3	1.2	-0.3	0.4	0.0	0.1	-0.8
A58 Bury Street (East of A58 Bury Street/ Pilsworth Jct)	0.5	0.3	1.0	0.2	0.1	0.6	0.5	0.7
Pilsworth Road (South of A58 Bury Street/ Pilsworth Jct)	0.9	0.7	2.3	0.8	0.3	1.2	1.1	1.6
A58 Bury Street (west of A58 Bury Street/ Pilsworth Jct)	0.1	0.0	0.9	0.1	0.4	0.2	0.1	0.3
Pilsworth Road (East of M66 Jct 3)	3.0	2.8	3.9	3.4	0.0	3.4	3.3	2.7
M66 SB on slip (south of M66 Jct 3)	0.9	0.1	1.7	-0.1	0.4	0.7	0.6	-0.8
M66 NB off slip (south of M66 Jct 3)	0.8	0.2	1.4	0.3	0.0	0.9	0.8	0.1
Pilsworth Road (East of M66 Jct 3)	3.0	2.8	3.9	3.4	0.0	3.4	3.3	2.7
M66 NB on slip (north of M66 Jct 3)	0.6	0.5	1.4	1.3	0.2	0.9	0.8	0.9
M66 SB off slip (north of M66 Jct 3)	1.2	2.3	2.5	2.4	0.1	2.4	2.5	2.5
M66 SB on slip (south of of M66 Jct 2)	0.1	-0.1	0.5	0.0	0.2	0.2	0.1	0.1
M66 NB off slip (south of of M66 Jct 2)	0.3	0.0	1.3	0.4	0.4	0.4	0.3	0.3
M66 NB on slip (north of of M66 Jct 2)	-0.2	-0.2	-1.2	-0.4	-0.3	-0.9	-0.6	-0.6

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link
M66 SB off slip (north of of M66 Jct 2)	-0.7	-0.6	-0.2	-0.9	0.4	-0.6	-0.7	-0.7
A6046 Hollin Lane (north of Hollin Lane/ Langley Lane Jct)	0.3	0.1	2.2	1.0	0.8	1.2	1.1	1.1
A6046 Hollin Lane (south of Hollin Lane/ Langley Lane Jct)	0.2	0.0	1.8	0.7	0.6	0.9	0.8	0.8
Langley Lane (west of Hollin Lane/ Langley Lane Jct)	-0.3	-0.7	-0.8	-1.1	-0.2	-0.5	-0.6	-0.7
Hollins Lane (east of Hollins Lane/ Croft Lane/ Hollins Brow Jct)	0.5	0.5	1.9	0.5	0.7	1.6	1.2	1.2
Croft Lane (north of Hollins Lane/ Croft Lane/ Hollins Brow Jct)	0.6	0.7	2.0	1.6	0.8	1.7	1.5	1.5
A56 Manchester Road (north of A56 Manchester Road/ Hollins Brow Jct)	0.3	0.3	1.4	1.2	0.4	1.1	0.9	0.9
Hollins Brow (east of A56 Manchester Road/ Hollins Brow Jct)	0.5	0.6	1.7	1.8	0.6	1.4	1.3	1.2
A56 Manchester Road (south of A56 Manchester Road/ Hollins Brow Jct)	0.1	0.0	0.6	0.1	0.3	0.4	0.2	0.1
M60 EB off slip (north of M62/M66 Jct 18)	0.2	-0.4	1.1	0.4	0.1	0.0	-0.1	-0.5
M62 EB on slip (east of M62/M66 Jct 18)	-0.4	-1.8	-2.0	-2.2	0.1	-1.2	-1.4	-1.5
M62 SB off slip (east of M62/M66 Jct 18)	0.0	-0.6	1.1	0.3	0.5	0.4	0.2	0.5
M60 SB on slip (south of M62/M66 Jct 18)	-0.1	0.0	3.1	2.5	0.6	1.1	1.0	1.4
M60 WB off slip (south of M62/M66 Jct 18)	-0.1	0.0	-2.2	-1.2	-0.6	-0.3	0.2	0.2
M62 WB on slip (west of M62/M66 Jct 18)	0.0	-0.1	-1.8	-0.7	-0.9	-0.8	-0.4	-0.5
M62 NB off slip (north of M62/M66 Jct 18)	0.1	0.0	-0.5	-0.4	0.0	0.0	0.0	0.0
M60 NB on slip (north of M62/M66 Jct 18)	0.1	0.0	-0.1	-0.1	-0.3	-0.1	-0.1	-0.4
Jun 18 - M62 through roads SWB between slip roads	0.2	0.1	1.1	0.5	0.3	0.5	0.4	0.3
Jun 18 - M62 through roads NEB between slip roads	0.1	0.1	1.0	0.3	0.4	0.5	0.4	0.4
Jun 18 - M62 through roads EB between slip roads	0.0	0.0	0.5	0.2	0.2	0.2	0.2	0.3
Jun 18 - M62 through roads EB between slip roads	0.0	0.0	0.7	0.3	0.3	0.4	0.3	0.3
A627 SB (north of M62/A627 Jct 20)	0.0	0.0	0.3	0.2	-0.1	-0.1	0.0	0.0
A627 NB (north of M62/A627 Jct 20)	0.0	0.0	0.2	0.1	-0.1	0.1	0.1	0.1
M62 EB on slip (east of M62/A627 Jct 20)	-0.1	0.0	-1.7	-0.1	-1.0	-1.7	-1.0	-1.0
M62 SB off slip (east of M62/A627 Jct 20)	0.0	0.0	1.6	0.1	0.9	0.7	0.5	0.5
A627 SB (south of M62/A627 Jct 20)	0.0	0.0	0.6	0.0	0.2	0.1	0.1	0.1
A627 NB (south of M62/A627 Jct 20)	0.0	0.0	0.3	0.2	-0.2	0.0	-0.1	-0.1
M62 WB on slip (west of M62/A627 Jct 20)	0.1	0.2	0.2	0.6	-0.1	-0.4	0.4	0.5
M62 NB off slip (west of M62/A627 Jct 20)	0.1	0.3	1.7	0.6	0.1	0.7	0.8	0.7
Jun 20 - M62 EB through road link	0.0	0.0	0.4	0.1	0.1	0.2	0.2	0.2
Jun 20 - M62 WB through road link	0.0	0.1	0.5	0.1	0.2	0.3	0.2	0.2
A576 NEB (north of M60 Jct 19)	0.1	0.2	1.4	0.7	0.5	0.6	0.6	0.5
A576 EB (north of M60 Jct 19)	0.0	-0.1	0.3	0.0	0.1	0.0	-0.1	0.0
M60 EB on slip (east of M60 Jct 19)	-0.1	-0.2	0.1	-0.3	0.2	0.0	0.0	0.0
M60 SWB off slip (east of M60 Jct 19)	-0.1	0.0	-0.5	-0.3	-0.1	-0.3	-0.3	-0.4
A576 Middleton Road SWB (south of M60 Jct 19)	0.0	0.0	0.9	0.2	0.4	0.4	0.2	0.2
A576 Middleton Road NWB (south of M60 Jct 19)	0.0	0.0	0.2	-0.5	0.4	0.5	0.3	0.6
M60 NWB on slip (west of M60 Jct 19)	0.1	0.1	-0.2	-0.6	0.2	0.6	0.6	0.6
M60 SEB off slip (west of M60 Jct 19)	0.1	0.1	1.1	0.7	0.3	0.4	0.4	0.4
Jun 19 - M60 WB through road link	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.1
Jun 19 - M60 EB through road link	0.0	0.1	0.3	0.2	0.0	0.1	0.1	0.1
B6221 Wash Lane (north of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.2	0.2	0.8	0.9	0.2	0.6	0.5	0.5

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link
A58 Rochdale Road (east of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.2	0.2	1.1	1.2	0.2	0.7	0.6	0.6
A58 Rochdale Road (west of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.2	0.2	1.4	1.2	0.4	0.9	0.8	0.8
Hill Top Road (northeast of the Hareshill Road/ Hill Top Road Jct)	0.0	0.1	0.4	0.2	0.2	0.4	0.2	0.2
A6045 Heywood Old Road (north of A6045/ A576 / Kelvin Avenue Jct)	-0.1	-0.1	1.9	1.0	0.2	0.8	0.8	0.6
A576 Manchester Old Road (east of A6045/ A576 / Kelvin Avenue Jct)	0.1	0.1	1.2	0.3	0.4	0.5	0.4	0.4
Kelvin Avenue (south of A6045/ A576 / Kelvin Avenue Jct)	0.0	0.0	0.9	0.3	0.3	0.5	0.4	0.4
A576 Middleton Road (west of A6045/ A576 / Kelvin Avenue Jct)	0.0	0.1	1.2	0.5	0.4	0.5	0.4	0.4
Hollins Lane (Parr Lane/ Hollins Lane/ Castle Road Jct)	0.6	0.4	2.2	0.6	0.9	1.9	1.4	1.4
Parr Lane (Parr Lane/ Hollins Lane/ Castle Road Jct)	0.6	0.4	2.3	0.7	0.9	1.9	1.5	1.5
Castle Road (Parr Lane/ Hollins Lane/ Castle Road Jct)								
Pilsworth Road (SW of the Pilsworth Road/ Pilsworth Way Jct)	0.3	0.4	1.3	1.0	0.4	1.1	0.9	0.9
Pilsworth Road (Northeast of the Roach Bank Road/ Pilsworth Road Jct)	0.3	0.4	1.4	0.8	0.4	1.0	0.8	0.8
Pilsworth Road (southwest of the Roach Bank Road/ Pilsworth Road Jct)	0.3	0.4	1.7	1.0	0.5	1.1	0.9	0.9
Roach Bank Road (West of the Roach Bank Road/ Pilsworth Road Jct)	0.0	0.0	0.5	0.1	0.2	0.3	0.2	0.2
East arm (Roach Bank Road/ Pilsworth Road Jct)	0.0	0.0	0.6	0.2	0.3	0.4	0.3	0.3
Pilsworth Road (west of the Pilsworth Road / Viridor Haul Road Jct)	3.0	2.8	3.9	3.4	0.0	3.4	3.3	2.7
A58 Bury New Road (west of the A58 Bury New Road/ Heap Brow Jct)	0.0	0.1	1.3	1.6	0.3	1.0	0.9	0.9
A58 Bury New Road (east of the A58 Bury New Road/ Heap Brow Jct)	0.0	-0.2	0.4	-0.2	0.3	0.0	-0.1	-0.2
Heap Brow (north of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.5	1.3	3.3	4.7	0.1	3.2	3.2	3.2
Moss Hall Road (south of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.7	1.4	2.7	3.5	0.0	2.7	2.7	2.6
Bury Old Road (east of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.8	0.8	1.2	0.6	0.3	1.3	1.2	0.8
A6045 Heywood Old Road (north of the A6045 Heywood Old Road/Ellis Lane Jct)	-0.1	-0.1	0.8	0.1	0.2	-0.1	-0.1	-0.3
A6045 Heywood Old Road (south of the A6045 Heywood Old Road/Ellis Lane Jct)	-0.1	-0.1	0.9	0.3	0.2	0.0	0.0	-0.2
Ellis Lane (off the A6045 Heywood Old Road/Ellis Lane Jct)								
Moss Hall Road (northwest of the Moss Hall Road/ Birch Industrial Park access)	-0.2	4.3	5.5	5.5	0.0	5.0	4.9	4.4
Moss Hall Road (south of the Moss Hall Road/ Birch Industrial Park access)	-0.7	8.0	8.3	8.3	-0.3	8.5	8.5	8.1
Birch Industrial Park (south of the Moss Hall Road/ Birch Industrial Park access)	0.0	0.0	1.3	0.0	0.2	0.2	0.1	0.1
A6045 Manchester Road (north of A6045 Manchester Road/ Newhouse Road)	0.1	0.1	0.5	0.3	0.3	0.2	0.2	0.8
A6045 Manchester Road (south of A6045 Manchester Road/ Newhouse Road)	0.0	0.1	0.7	0.1	0.3	0.3	0.2	0.6
Newhouse Road (south of A6045 Manchester Road/ Newhouse Road)	0.0	0.2	-0.4	0.1	0.5	0.5	0.3	0.3
A6046 Manchester Road (north of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	0.0	0.0	1.4	0.0	0.6	0.6	0.5	0.4
A6045 Manchester Road (south of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	0.0	0.0	1.4	0.0	0.5	0.5	0.4	0.3
Middleton Road (southeast of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
A6046 Middleton Road (north of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	-0.1	1.1	0.1	0.6	0.5	0.4	-0.2
A6046 Middleton Road (south of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	-0.1	0.7	0.0	0.3	0.2	0.2	-0.1
Lenten Grove (west of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	0.0	-0.3	0.1	0.3	0.4	0.2	0.2

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link
Tangmere Avenue (east of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	0.0	-0.4	0.0	0.4	0.4	0.2	0.2
A6045 Manchester Road (south of the A6045 Manchester Road/ Workers Way Jct)	0.0	0.1	1.5	0.3	0.3	0.1	0.1	-0.1
A6045 Heywood Old Road (North of A6045/ Langley Lane Junction)	-0.1	0.0	1.3	0.2	0.3	0.1	0.0	-0.3
A6045 Heywood Old Road (South of A6045/ Langley Lane Junction)	-0.2	-0.2	0.8	-0.1	0.2	-0.2	-0.2	-0.5
M66 north of Jct 2 - SB	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.0
M66 north of Jct 2 - NB	0.0	0.0	0.5	0.1	0.2	0.3	0.2	0.2
M66 between Jct 2 and Jct 3 - SB	0.1	0.0	0.4	0.1	0.2	0.3	0.2	0.2
M66 between Jct 2 and Jct 3 - NB	0.0	0.0	0.7	0.3	0.3	0.3	0.2	0.2
M66 between Jct 3 and M62 Jct 18 - SB	0.1	-0.2	0.4	-0.1	0.2	0.2	0.0	-0.1
M66 between Jct 3 and M62 Jct 18 - NB	0.1	0.0	0.6	0.1	0.2	0.3	0.2	0.1
M62 west of Jct 18 - SB	0.0	0.0	0.4	0.2	0.1	0.1	0.1	0.1
M62 west of Jct 18 - NB	0.0	0.0	0.5	0.3	0.0	0.1	0.1	0.1
M62 between Jct 18 and Services - EB	0.0	-0.2	0.3	0.0	0.2	0.0	0.0	0.1
M62 between Jct 18 and Services - WB	0.0	-0.1	0.6	0.2	0.3	0.3	0.2	0.3
M62 between Services and Jct 19 - EB	0.0	-0.1	0.4	0.0	0.1	0.2	0.1	0.1
M62 between Services and Jct 19 - WB	0.0	-0.2	0.5	0.0	0.3	0.2	0.1	0.1
M62 between Jct 19 and 20 - EB	0.0	0.1	0.6	0.1	0.2	0.3	0.3	0.3
M62 between Jct 19 and 20 - WB	0.1	0.1	0.8	0.2	0.3	0.5	0.4	0.4
M62 east of Junction 20 - EB	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.1
M62 east of Junction 20 - WB	0.0	0.0	0.5	0.1	0.2	0.2	0.2	0.2
M60 between M62 Jct 18 and M60 jct 19. - EB	0.0	0.1	0.6	0.3	0.2	0.3	0.2	0.2
M60 between M62 Jct 18 and M60 jct 19. - WB	0.1	0.1	0.0	-0.3	0.1	0.3	0.2	0.2
M60 South of Jct 19 - EB	0.0	0.0	0.4	0.1	0.2	0.2	0.2	0.2
M60 South of Jct 19 - WB	0.0	0.0	0.2	-0.1	0.1	0.1	0.1	0.1
M60 Southwest of Jct 17 - EB	0.0	0.0	0.3	0.1	0.0	0.1	0.1	0.1
M60 Southwest of Jct 17 - WB	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.1
A56 Bury New Road SB (Immediately north of Junction 17)	0.0	0.0	0.6	0.2	0.2	0.4	0.1	0.1
A56 Bury New Road NB (Immediately north of Junction 17)	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
M60 NEB on slip road (Immediately east of Junction 17)	0.0	0.0	-0.2	0.6	0.0	-0.1	0.1	0.1
M60 SB off slip road (Immediately east of Junction 17)	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2
A56 Bury New Road SB (Immediately south of Junction 17)	0.0	0.0	0.5	0.2	0.2	0.2	0.2	0.2
A56 Bury New Road NB (Immediately south of Junction 17)	0.0	0.0	1.7	1.0	0.5	0.5	0.2	0.2
M60 SWB on slip road (Immediately west of Junction 17)	0.0	0.0	1.2	0.3	0.6	0.6	0.4	0.4
M60 NB off slip road (Immediately west of Junction 17)	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
M60 Jct 17 - through roads NEB between slip roads	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.1
M60 Jct 17 - through roads SWB between slip roads	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1
Whittle lane (West of Flyover with M62)	-2.6	-3.9	-3.0	-3.7	-0.2	-2.8	-2.9	-2.9
Whittle lane (Flyover with M62)	-2.6	-3.8	-3.0	-3.7	-0.2	-2.9	-2.9	-2.9
M66 J2 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.7	0.2	0.3	0.4	0.2	0.2
M66 J2 South Bound Motorway Mainline Link between the slips	0.1	0.0	0.3	0.1	0.1	0.2	0.1	0.1
M66 J3 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.6	0.2	0.3	0.3	0.2	0.1

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link
M66 J3 South Bound Motorway Mainline Link between the slips	0.0	-0.2	0.3	-0.1	0.2	0.1	0.0	0.0
M62 J18 Simister North Bound Motorway Mainline Link Between the slips	0.1	0.1	1.0	0.3	0.4	0.5	0.4	0.4
M62 J18 Simister South Bound Motorway Mainline Link Between the slips (Before West to South slip connection)	0.2	0.1	1.1	0.5	0.3	0.5	0.4	0.3
M62 J18 Simister South Bound Motorway Mainline Link Between the slips (After West to South slip connection)	0.1	0.1	4.6	4.3	0.1	0.2	0.2	0.1
M62 J18 Simister East Bound Motorway Mainline Link Between the slips	0.0	0.0	0.7	0.3	0.2	0.2	0.2	0.3
M62 J18 Simister West Bound Motorway Mainline Link Between the slips	0.0	0.0	0.7	0.3	0.3	0.4	0.3	0.3
M60 J19 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.1
M60 J19 South Bound Motorway Mainline Link between the slips	0.0	0.1	0.3	0.2	0.0	0.1	0.1	0.1
M62 J19 East Bound Motorway Mainline Link between the slips	-0.1	0.1	0.5	0.1	0.1	0.3	0.3	0.2
M62 J19 West Bound Motorway Mainline Link between the slips	0.0	0.1	0.8	0.3	0.3	0.5	0.4	0.4
M62 Birch Motorway Services	-0.1	-0.4	0.0	-0.4	0.2	-0.3	-0.3	-0.3
M62 Birch Motorway Services	0.0	-0.4	0.3	-0.2	0.3	-0.1	-0.2	-0.2

Table C.2: Night-time

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
SHLR (A6045 to M62 J19)	1.0	-1.1	2.3	0.1	0.5	-0.6	-0.6	-1.2
SHLR (West of Junction with A6045 Manchester Road)	1.1	-1.0	2.4	0.2	0.4	-0.7	-0.7	-0.9
SHLR (South East of SH Employment Junction)	1.0	-1.0	2.2	0.0	0.4	-0.7	-0.8	-0.9
SHLR (South of Pilsworth Road Junction)	1.8	-0.2	2.1	0.6	0.6	0.3	0.3	1.6
Pilsworth Road (Between SHLR & Heywood Distribution Park)	2.1	0.4	2.7	1.1	0.6	1.0	1.0	1.0
Pilsworth Road (Between Heywood Distribution Park & Plot 3 Access)	1.9	1.2	2.3	1.0	-0.1	1.7	1.6	0.3
Pilsworth Road (Between Plot 3 Access to 3-Arrows)	2.0	1.2	2.5	0.9	-0.1	1.8	1.7	0.2
Moss Hall Road (Immediately North of 3-Arrows Junction)	3.1	3.1	4.5	4.4	-0.1	3.8	3.8	3.2
M66 J3 Connector Road (East of Junction with Pilsworth Road)	1.0	0.4	1.7	1.4	-0.1	1.2	1.2	0.4
Moss Hall Road (North of Junction with Pilsworth Road)	1.6	2.4	4.1	5.1	0.0	4.0	4.0	3.9
Pilsworth Road (Immediately West of M66 J3)	0.5	0.5	1.5	1.1	0.4	1.1	1.0	0.9
Moss Hall Lane (Immediately South of 3-Arrows Junction)	4.8	3.0	5.4	5.7	0.0	4.8	4.6	4.0
Pilsworth Road (Immediately North of Junction with SHLR)	0.9	0.7	2.3	0.7	0.4	1.2	1.1	1.8
Whittle Lane (West of Junction with A6045 Heywood Old Road)	-1.9	-3.1	-2.5	-3.2	-0.2	-2.2	-2.3	-2.2
A6045 Manchester Road (Immediately North East of Junction with SHLR)	0.0	0.1	0.9	0.1	0.3	0.3	0.1	0.7
A6045 Manchester Road (North of Junction with Coronation Avenue)	0.0	-0.1	1.7	0.0	-0.1	-0.2	-0.3	-0.4
A6046 Middleton Road (Immediately South of M62 J19)	0.3	0.2	1.8	0.8	0.5	1.0	0.9	0.9
Langley Lane (East of Junction with A6045)	0.0	-0.1	0.4	-0.4	0.0	0.3	0.2	0.2
A6045 Manchester Road (Immediately South of Junction with Whittle Lane)	-0.1	-0.1	1.0	0.3	0.2	0.0	0.0	-0.1
M62 NEB on slip (Junction 19)	1.4	-0.5	2.0	0.9	0.7	-0.2	-0.2	0.3
M62 SWB off slip (Junction 19)	1.1	-0.1	1.9	-0.3	0.4	0.6	0.4	0.3
M62 SWB on slip (Junction 19)	-0.3				0.3			
M62 NEB off slip (Junction 19)	0.1				0.6			
Jun 19 - M62 through roads SWB between slip roads	-0.1	0.1	0.5	0.1	0.1	0.4	0.3	0.3
Jun 19 - M62 through roads NEB between slip roads	0.0	0.1	0.8	0.3	0.3	0.5	0.4	0.4
QEII Way (Immediately Northwest of Jct 19)	1.2	-1.1	2.6	0.4	0.7	-0.4	-0.5	-1.0
Middleton Road (North of the Middleton Road/Coronation Avenue Junction)	0.0	-0.1	0.0	0.1	0.0	-0.1	-0.2	-0.2
Coronation Avenue (West of the Middleton Road/Coronation Avenue Junction)	0.0	-0.3	1.3	-0.3	0.4	0.0	0.2	-0.8
A58 Bury Street (East of A58 Bury Street/ Pilsworth Jct)	0.6	0.4	1.2	0.3	0.1	0.6	0.5	0.8
Pilsworth Road (South of A58 Bury Street/ Pilsworth Jct)	1.0	0.9	2.5	0.9	0.2	1.4	1.3	1.8
A58 Bury Street (west of A58 Bury Street/ Pilsworth Jct)	0.1	0.0	1.0	0.2	0.4	0.2	0.0	0.4
Pilsworth Road (East of M66 Jct 3)	2.9	2.7	3.9	3.3	0.0	3.2	3.2	2.5
M66 SB on slip (south of M66 Jct 3)	0.9	0.1	1.8	-0.1	0.4	0.7	0.6	-0.8
M66 NB off slip (south of M66 Jct 3)	0.9	0.2	1.4	0.2	-0.1	0.9	0.8	0.0
Pilsworth Road (East of M66 Jct 3)	2.9	2.7	3.9	3.3	0.0	3.2	3.2	2.5
M66 NB on slip (north of M66 Jct 3)	0.6	0.5	1.5	1.3	0.3	0.9	0.8	0.9
M66 SB off slip (north of M66 Jct 3)	1.2	2.5	2.7	2.5	0.1	2.5	2.6	2.7
M66 SB on slip (south of of M66 Jct 2)	0.1	-0.2	0.4	-0.1	0.2	0.2	0.0	0.0
M66 NB off slip (south of of M66 Jct 2)	0.3	0.0	1.4	0.4	0.4	0.4	0.3	0.3

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
M66 NB on slip (north of of M66 Jct 2)	-0.2	-0.2	-1.1	-0.4	-0.3	-0.9	-0.6	-0.6
M66 SB off slip (north of of M66 Jct 2)	-0.7	-0.7	-0.3	-0.9	0.4	-0.7	-0.8	-0.8
A6046 Hollin Lane (north of Hollin Lane/ Langley Lane Jct)	0.4	0.2	2.5	1.1	0.9	1.4	1.3	1.3
A6046 Hollin Lane (south of Hollin Lane/ Langley Lane Jct)	0.3	0.1	2.1	0.8	0.6	1.1	1.0	1.0
Langley Lane (west of Hollin Lane/ Langley Lane Jct)	-0.3	-0.7	-0.6	-1.0	-0.2	-0.5	-0.5	-0.6
Hollins Lane (east of Hollins Lane/ Croft Lane/ Hollins Brow Jct)	0.6	0.5	2.0	0.5	0.8	1.8	1.3	1.3
Croft Lane (north of Hollins Lane/ Croft Lane/ Hollins Brow Jct)	0.7	0.8	2.2	1.8	0.9	1.9	1.7	1.6
A56 Manchester Road (north of A56 Manchester Road/ Hollins Brow Jct)	0.4	0.4	1.5	1.4	0.4	1.2	1.0	1.0
Hollins Brow (east of A56 Manchester Road/ Hollins Brow Jct)	0.6	0.7	1.9	2.1	0.6	1.6	1.5	1.4
A56 Manchester Road (south of A56 Manchester Road/ Hollins Brow Jct)	0.0	0.0	0.6	0.1	0.3	0.4	0.2	0.1
M60 EB off slip (north of M62/M66 Jct 18)	0.2	-0.4	0.9	0.3	0.1	-0.1	-0.2	-0.6
M62 EB on slip (east of M62/M66 Jct 18)	-0.4	-2.0	-2.2	-2.3	0.0	-1.4	-1.7	-1.7
M62 SB off slip (east of M62/M66 Jct 18)	0.0	-0.7	1.0	0.1	0.5	0.3	0.2	0.4
M60 SB on slip (south of M62/M66 Jct 18)	-0.1	0.1	3.0	2.4	0.6	1.2	1.1	1.5
M60 WB off slip (south of M62/M66 Jct 18)	-0.1	0.0	-1.9	-1.1	-0.5	-0.1	0.4	0.5
M62 WB on slip (west of M62/M66 Jct 18)	0.1	0.0	-1.7	-0.7	-0.9	-0.7	-0.4	-0.5
M62 NB off slip (north of M62/M66 Jct 18)	0.1	0.0	-0.4	-0.3	0.0	0.0	0.0	-0.1
M60 NB on slip (north of M62/M66 Jct 18)	0.2	0.0	-0.2	-0.2	-0.3	-0.1	-0.1	-0.5
Jun 18 - M62 through roads SWB between slip roads	0.2	0.1	1.1	0.5	0.3	0.5	0.4	0.2
Jun 18 - M62 through roads NEB between slip roads	0.1	0.1	1.1	0.3	0.4	0.5	0.4	0.4
Jun 18 - M62 through roads EB between slip roads	0.0	0.1	0.6	0.3	0.2	0.2	0.2	0.3
Jun 18 - M62 through roads EB between slip roads	0.0	0.0	0.7	0.3	0.3	0.4	0.3	0.3
A627 SB (north of M62/A627 Jct 20)	0.0	0.1	0.4	0.2	-0.1	-0.1	0.0	0.0
A627 NB (north of M62/A627 Jct 20)	0.0	0.0	0.3	0.1	-0.1	0.2	0.2	0.1
M62 EB on slip (east of M62/A627 Jct 20)	-0.1	0.0	-1.5	-0.1	-1.0	-1.6	-1.0	-1.0
M62 SB off slip (east of M62/A627 Jct 20)	0.0	0.0	1.8	0.1	0.9	0.8	0.5	0.6
A627 SB (south of M62/A627 Jct 20)	0.0	0.0	0.6	0.1	0.2	0.1	0.1	0.1
A627 NB (south of M62/A627 Jct 20)	0.0	0.0	0.5	0.2	-0.2	0.1	0.0	0.0
M62 WB on slip (west of M62/A627 Jct 20)	0.2	0.2	0.4	0.7	-0.1	-0.2	0.5	0.5
M62 NB off slip (west of M62/A627 Jct 20)	0.1	0.3	1.9	0.7	0.1	0.8	0.9	0.8
Jun 20 - M62 EB through road link	0.0	0.0	0.4	0.1	0.1	0.2	0.2	0.2
Jun 20 - M62 WB through road link	0.1	0.1	0.5	0.1	0.2	0.3	0.2	0.2
A576 NEB (north of M60 Jct 19)	0.1	0.2	1.5	0.7	0.5	0.6	0.6	0.5
A576 EB (north of M60 Jct 19)	-0.1	-0.1	0.2	0.0	0.1	-0.1	-0.2	-0.1
M60 EB on slip (east of M60 Jct 19)	-0.1	-0.2	0.1	-0.3	0.1	0.0	0.0	0.0
M60 SWB off slip (east of M60 Jct 19)	-0.1	0.0	-0.3	-0.3	0.0	-0.2	-0.2	-0.4
A576 Middleton Road SWB (south of M60 Jct 19)	0.0	0.0	0.9	0.2	0.4	0.3	0.2	0.2
A576 Middleton Road NWB (south of M60 Jct 19)	0.0	0.1	0.2	-0.6	0.4	0.6	0.3	0.6
M60 NWB on slip (west of M60 Jct 19)	0.1	0.1	-0.2	-0.7	0.2	0.6	0.5	0.6
M60 SEB off slip (west of M60 Jct 19)	0.1	0.1	1.2	0.7	0.4	0.4	0.4	0.4
Jun 19 - M60 WB through road link	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.1

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
Jun 19 - M60 EB through road link	0.1	0.1	0.3	0.2	0.0	0.1	0.1	0.1
B6221 Wash Lane (north of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.2	0.2	0.9	1.1	0.2	0.7	0.6	0.6
A58 Rochdale Road (east of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.3	0.3	1.1	1.3	0.2	0.7	0.7	0.7
A58 Rochdale Road (west of the B6221 Wash Lane/ A58 Rochdale Road Jct)	0.3	0.3	1.5	1.3	0.4	1.0	0.9	0.9
Hill Top Road (northeast of the Hareshill Road/ Hill Top Road Jct)	0.1	0.1	0.4	0.2	0.2	0.4	0.2	0.2
A6045 Heywood Old Road (north of A6045/ A576 / Kelvin Avenue Jct)	-0.1	-0.1	1.9	1.0	0.2	0.8	0.7	0.5
A576 Manchester Old Road (east of A6045/ A576 / Kelvin Avenue Jct)	0.1	0.1	1.3	0.4	0.4	0.6	0.4	0.5
Kelvin Avenue (south of A6045/ A576 / Kelvin Avenue Jct)	0.0	0.0	0.8	0.2	0.3	0.5	0.0	0.4
A576 Middleton Road (west of A6045/ A576 / Kelvin Avenue Jct)	0.0	0.1	1.2	0.5	0.4	0.5	0.4	0.3
Hollins Lane (Parr Lane/ Hollins Lane/ Castle Road Jct)	0.6	0.4	2.2	0.5	1.0	1.9	1.4	1.4
Parr Lane (Parr Lane/ Hollins Lane/ Castle Road Jct)	0.6	0.4	2.2	0.6	1.0	2.0	1.5	1.4
Castle Road (Parr Lane/ Hollins Lane/ Castle Road Jct)								
Pilsworth Road (SW of the Pilsworth Road/ Pilsworth Way Jct)	0.4	0.5	1.5	1.2	0.4	1.3	1.1	1.1
Pilsworth Road (Northeast of the Roach Bank Road/ Pilsworth Road Jct)	0.3	0.4	1.5	0.9	0.4	1.1	0.9	0.9
Pilsworth Road (southwest of the Roach Bank Road/ Pilsworth Road Jct)	0.4	0.4	1.9	1.1	0.5	1.2	1.0	1.0
Roach Bank Road (West of the Roach Bank Road/ Pilsworth Road Jct)	0.0	0.0	0.5	0.1	0.2	0.3	0.2	0.2
East arm (Roach Bank Road/ Pilsworth Road Jct)	0.1	0.0	0.6	0.2	0.3	0.4	0.3	0.3
Pilsworth Road (west of the Pilsworth Road / Viridor Haul Road Jct)	2.9	2.7	3.9	3.3	0.0	3.2	3.2	2.5
A58 Bury New Road (west of the A58 Bury New Road/ Heap Brow Jct)	0.1	0.1	1.5	1.8	0.3	1.1	1.1	1.0
A58 Bury New Road (east of the A58 Bury New Road/ Heap Brow Jct)	0.0	-0.2	0.4	-0.2	0.3	0.0	-0.1	-0.2
Heap Brow (north of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.7	1.5	3.7	5.3	0.1	3.6	3.6	3.6
Moss Hall Road (south of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.9	1.6	3.1	4.1	0.0	3.1	3.0	3.0
Bury Old Road (east of the Heap Brow/ Bury Old Road/ Moss Hall Road Jct)	0.8	0.9	1.4	0.8	0.3	1.5	1.3	0.9
A6045 Heywood Old Road (north of the A6045 Heywood Old Road/Ellis Lane Jct)	-0.1	-0.1	0.9	0.1	0.2	-0.1	-0.2	-0.4
A6045 Heywood Old Road (south of the A6045 Heywood Old Road/Ellis Lane Jct)	-0.1	-0.1	0.9	0.2	0.2	-0.1	-0.1	-0.3
Ellis Lane (off the A6045 Heywood Old Road/Ellis Lane Jct)								
Moss Hall Road (northwest of the Moss Hall Road/ Birch Industrial Park access)	-0.2	4.5	5.9	5.9	0.0	5.2	5.2	4.6
Moss Hall Road (south of the Moss Hall Road/ Birch Industrial Park access)	-0.7	9.1	9.5	9.4	-0.3	9.7	9.7	9.2
Birch Industrial Park (south of the Moss Hall Road/ Birch Industrial Park access)	0.0	0.0	1.4	0.0	0.2	0.2	0.1	0.1
A6045 Manchester Road (north of A6045 Manchester Road/ Newhouse Road)	0.1	0.1	0.6	0.3	0.3	0.1	0.2	0.8
A6045 Manchester Road (south of A6045 Manchester Road/ Newhouse Road)	0.0	0.1	0.7	0.1	0.3	0.3	0.1	0.6
Newhouse Road (south of A6045 Manchester Road/ Newhouse Road)	0.0	0.1	-0.3	0.2	0.5	0.6	0.2	0.3
A6046 Manchester Road (north of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	0.0	0.0	1.6	0.0	0.6	0.6	0.6	0.5
A6045 Manchester Road (south of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	0.0	0.0	1.5	0.0	0.5	0.5	0.5	0.3
Middleton Road (southeast of the A6046 Manchester/ A6045 Manchester/ Middleton Road Jct)	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
A6046 Middleton Road (north of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	-0.1	1.4	0.1	0.6	0.5	0.5	-0.2

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
A6046 Middleton Road (south of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	-0.1	0.9	0.0	0.3	0.3	0.3	-0.1
Lenten Grove (west of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	0.0	-0.2	0.1	0.3	0.4	0.3	0.2
Tangmere Avenue (east of the A6046 Middleton Road/ Tangmere Avenue/ Lenten Grove Jct)	0.0	0.0	-0.3	0.0	0.3	0.4	0.1	0.2
A6045 Manchester Road (south of the A6045 Manchester Road/ Workers Way Jct)	0.0	0.1	1.5	0.2	0.2	0.0	0.0	-0.2
A6045 Heywood Old Road (North of A6045/ Langley Lane Junction)	-0.2	-0.1	1.3	0.2	0.3	0.0	-0.1	-0.4
A6045 Heywood Old Road (South of A6045/ Langley Lane Junction)	-0.2	-0.2	0.9	-0.1	0.2	-0.3	-0.3	-0.6
M66 north of Jct 2 - SB	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
M66 north of Jct 2 - NB	0.0	0.0	0.5	0.2	0.2	0.3	0.2	0.2
M66 between Jct 2 and Jct 3 - SB	0.1	0.0	0.4	0.1	0.1	0.2	0.1	0.1
M66 between Jct 2 and Jct 3 - NB	0.0	0.0	0.7	0.2	0.3	0.3	0.2	0.2
M66 between Jct 3 and M62 Jct 18 - SB	0.1	-0.2	0.4	-0.2	0.2	0.1	0.0	-0.2
M66 between Jct 3 and M62 Jct 18 - NB	0.2	0.0	0.6	0.1	0.1	0.3	0.2	0.0
M62 west of Jct 18 - SB	0.0	0.0	0.4	0.2	0.1	0.1	0.1	0.1
M62 west of Jct 18 - NB	0.0	0.0	0.5	0.3	0.0	0.1	0.1	0.1
M62 between Jct 18 and Services - EB	-0.1	-0.2	0.3	0.0	0.1	0.0	0.0	0.1
M62 between Jct 18 and Services - WB	0.0	-0.1	0.6	0.2	0.3	0.3	0.2	0.3
M62 between Services and Jct 19 - EB	0.0	-0.1	0.4	0.0	0.1	0.2	0.1	0.1
M62 between Services and Jct 19 - WB	0.0	-0.2	0.5	0.0	0.3	0.2	0.1	0.1
M62 between Jct 19 and 20 - EB	0.1	0.1	0.6	0.1	0.2	0.3	0.3	0.3
M62 between Jct 19 and 20 - WB	0.1	0.1	0.8	0.2	0.3	0.5	0.4	0.4
M62 east of Junction 20 - EB	0.0	0.0	0.3	0.1	0.0	0.1	0.1	0.1
M62 east of Junction 20 - WB	0.0	0.0	0.5	0.1	0.2	0.2	0.2	0.2
M60 between M62 Jct 18 and M60 jct 19. - EB	0.1	0.1	0.5	0.3	0.1	0.3	0.2	0.2
M60 between M62 Jct 18 and M60 jct 19. - WB	0.1	0.1	0.0	-0.2	0.1	0.3	0.2	0.2
M60 South of Jct 19 - EB	0.0	0.0	0.4	0.2	0.1	0.2	0.2	0.2
M60 South of Jct 19 - WB	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.1
M60 Southwest of Jct 17 - EB	0.0	0.0	0.3	0.1	0.0	0.1	0.1	0.1
M60 Southwest of Jct 17 - WB	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.1
A56 Bury New Road SB (Immediately north of Junction 17)	0.0	0.0	0.6	0.2	0.2	0.4	0.1	0.1
A56 Bury New Road NB (Immediately north of Junction 17)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
M60 NEB on slip road (Immediately east of Junction 17)	0.0	0.0	0.2	0.7	0.2	0.1	0.3	0.3
M60 SB off slip road (Immediately east of Junction 17)	0.0	0.0	0.1	0.2	0.0	0.1	0.2	0.2
A56 Bury New Road SB (Immediately south of Junction 17)	0.0	0.0	0.5	0.2	0.2	0.2	0.2	0.2
A56 Bury New Road NB (Immediately south of Junction 17)	0.0	0.0	1.7	1.0	0.6	0.5	0.2	0.2
M60 SWB on slip road (Immediately west of Junction 17)	0.0	0.0	1.0	0.3	0.6	0.6	0.3	0.4
M60 NB off slip road (Immediately west of Junction 17)	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.1
M60 Jct 17 - through roads NEB between slip roads	0.0	0.0	0.3	0.1	0.1	0.2	0.1	0.1

Description	SCENARIO							
	SHORT TERM		LONG TERM					
	2032 DM v 2032 DS (Without M62 MAM)	2032 DM v 2032 DS (With M62 MAM)	2024 Base v 2047 DS	2024 Base v 2024 Base with Dev	2032 DM v 2047 DM	2032 DM v 2047 DS	2032 DM v 2039 DS (No Area CCC Link)	2032 DM v 2039 DS (With Area CCC Link)
M60 Jct 17 - through roads SWB between slip roads	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1
Whittle lane (West of Flyover with M62)	-2.6	-3.9	-3.0	-3.7	-0.2	-2.8	-2.9	-2.9
Whittle lane (Flyover with M62)	-2.6	-3.8	-3.0	-3.7	-0.2	-2.9	-2.9	-2.9
M66 J2 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.7	0.2	0.3	0.4	0.2	0.2
M66 J2 South Bound Motorway Mainline Link between the slips	0.1	0.0	0.3	0.1	0.1	0.2	0.1	0.1
M66 J3 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.6	0.2	0.2	0.2	0.1	0.1
M66 J3 South Bound Motorway Mainline Link between the slips	0.0	-0.2	0.2	-0.1	0.1	0.1	-0.1	-0.1
M62 J18 Simister North Bound Motorway Mainline Link Between the slips	0.1	0.1	1.1	0.3	0.4	0.5	0.4	0.4
M62 J18 Simister South Bound Motorway Mainline Link Between the slips (Before West to South slip connection)	0.2	0.1	1.1	0.5	0.3	0.5	0.4	0.2
M62 J18 Simister South Bound Motorway Mainline Link Between the slips (After West to South slip connection)	0.1	0.1	4.7	4.4	0.1	0.2	0.2	0.1
M62 J18 Simister East Bound Motorway Mainline Link Between the slips	0.0	0.0	0.7	0.3	0.2	0.2	0.2	0.3
M62 J18 Simister West Bound Motorway Mainline Link Between the slips	0.0	0.0	0.7	0.3	0.3	0.4	0.3	0.3
M60 J19 North Bound Motorway Mainline Link between the slips	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.1
M60 J19 South Bound Motorway Mainline Link between the slips	0.1	0.1	0.3	0.2	0.0	0.1	0.1	0.1
M62 J19 East Bound Motorway Mainline Link between the slips	-0.1	0.1	0.5	0.1	0.1	0.4	0.3	0.3
M62 J19 West Bound Motorway Mainline Link between the slips	0.0	0.1	0.8	0.3	0.3	0.5	0.4	0.4
M62 Birch Motorway Services	-0.1	-0.4	0.0	-0.3	0.1	-0.3	-0.4	-0.4
M62 Birch Motorway Services	0.0	-0.4	0.3	-0.2	0.3	-0.1	-0.2	-0.2

APPENDIX D

FIGURES

