M60/M62/M66 Simister Island Interchange

TR010064

ENVIRONMENTAL STATEMENT
NON-TECHNICAL SUMMARY

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Planning Act 2008

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

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

M60/M62/M66 Simister Island Interchange

Development Consent Order 202[ ]

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1 Introduction

1.1.1 National Highways (the 'Applicant') is the Government company charged with operating, maintaining and improving England's motorways and major A-roads.

1.1.2 The M60/M62/M66 Simister Island Interchange (the 'Scheme') would deliver improvements to the M60/M62/M66 Simister Island Interchange and the M60 between junction (J) 17 and J18. The Scheme is located within the administrative area of Bury Metropolitan Borough Council in Greater Manchester (see Figure 1: Location Plan).

1.1.3 The Scheme involves widening of the motorway between J17 to J18 of the M60 from four lanes to five lanes in both directions and installation of a hard shoulder, widening of the M66 southbound through M60 J18 from two lanes to four lanes, construction of a new link road (known as the Northern Loop) linking the M60 eastbound to M60 southbound, and alterations to other slip roads around M60 J18 (further detail is given in Section 2.4).

1.1.4 It should be noted that the interchange is situated on more than one motorway and as a result has three junction numbers: M60 J18, M66 J4 and M62 J18. For the purpose of this Scheme, and therefore this document, the interchange is referred to as M60 J18.

1.1.5 The Scheme is identified as a Nationally Significant Infrastructure Project under the Planning Act 2008, which means that an application for a Development Consent Order is required to build and operate it. The Applicant's application for a Development Consent Order will be examined by an independently appointed Examining Authority which will make a recommendation to the Secretary of State for Transport as whether the Development Consent Order should be granted. The Secretary of State will then issue a decision on the application.

1.1.6 The Scheme could result in significant environmental effects, so an Environmental Impact Assessment was deemed to be required. The results of the Environmental Impact Assessment have been documented in the Environmental Statement, which has been submitted as part of the application for a Development Consent Order. This Non-Technical Summary forms part of the Environmental Statement and summarises the results of the Environmental Statement in non-technical language.

1.1.7 The Environmental Statement is part of a series of documents that makes up the application for a Development Consent Order and is taken into consideration by the Examining Authority during the examination of the application for a Development Consent Order.

1.1.8 The Environmental Statement sets out a description of the Scheme, reasonable alternatives considered in the development of the Scheme design, the environmental setting, the potential impacts of the Scheme on local communities and the environment, and the measures that would be taken to reduce negative (adverse) effects before reporting the likely significant adverse or positive (beneficial) effects of the Scheme.

1.1.9 The Environmental Statement consists of four volumes:

- Volume 6.1: Environmental Statement – the main chapters of the Environmental Statement, providing Scheme information and the results of the environmental assessments. Chapters 1 to 4 of the Environmental Statement provide background to the Scheme, and Chapters 5 to 15 provide environmental aspect assessments (such as air quality and noise and vibration assessments). A summary of the likely significant effects identified in the assessments is then provided in Chapter 16.
- Volume 6.2: Environmental Statement Figures – drawings ('figures') to support the main chapters of the Environmental Statement.
- Volume 6.3: Environmental Statement Appendices – technical appendices to support the main chapters of the Environmental Statement.
- Volume 6.4: Environmental Statement Non-Technical Summary – this document. This Non-Technical Summary provides a summary of the Environmental Statement in non-technical language.

1.1.10 The Environmental Statement and other documentation submitted by the Applicant in support of the Development Consent Order application are available from the National Infrastructure Planning webpage for the Scheme under 'National Infrastructure Applications' or at the following link[1]: https://infrastructure.planninginspectorate.gov.uk/projects/north-west/m60-m62-m66-simister-island/.

[1] Alternatively the Planning Inspectorate's case team can be contacted via email at M60SimisterIsland@planninginspectorate.gov.uk or via telephone at 0303 444 5000 to request copies of the Development Consent Order application documentation.

2 The Scheme

2.1 Need for the Scheme

2.1.1 M60 J18 provides the interchange between the M60, M62, and M66 motorways to the north of Manchester. The M60, M62 and M66 motorways connect important economic areas within Greater Manchester, and also facilitate a connection to Leeds, another important economic area.

2.1.2 Several significant economic areas are accessed from M60 J18, including Manchester's city centre and central business district, Bury town centre, Heaton Park and the Pilsworth Road industrial estate.

2.1.3 M60 J18 is one of the busiest motorway junctions in the north-west (see Plate 2.1), used by approximately 90,000 vehicles every day. This high volume of traffic is above the capacity the interchange was designed for, resulting in congestion and delays. A high accident rate is another issue associated with the junction and surrounding routes.

2.1.4 Significant development allocations are located in Bury, Rochdale and Oldham through the Greater Manchester Combined Authority's Places for Everyone Plan and Atom Valley, Manchester's Mayoral Development Zone. The Places for Everyone Plan is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes and sustainable growth. Atom Valley aims to deliver 1.6 million square metres of employment space, 20,000 jobs and 7,000 homes over three major employment sites, including the Northern Gateway development between M60 J18 and M62 J19 in South Heywood. The Northern Gateway proposal includes up to 1.2 million square metres of employment floorspace in the area immediately to the north-east of M60 J18, and over 2,500 residential units around Simister and Heywood. It is anticipated that these developments would impact on both the M60 and M62, leading to extra pressure on M60 J18.

2.1.5 If the capacity constraints on the northern section of the M60/M62 are not addressed, its impact on the wider transport network in the north could hold back growth across the region. Some of the busiest stretches of road outside the M25 are located between Junctions 8-18 of the M60, and the combination of local and strategic traffic, coupled with the design of the road, further worsens congestion and environmental problems.

Plate 2.1 Traffic on the M60

2.2 Scheme objectives

2.2.1 The main objectives of the Scheme are to:

- Improve the journey experience for users of this section of the network by:
  - Reducing traffic congestion at peak times and reducing journey times (up to three minutes during rush hour from M66 J3 and M60 J17) by increasing the capacity of the interchange and allowing traffic to flow more freely
  - Delivering more reliable journey times
- Provide a Scheme that is safe for all road users
- Minimise the impact of the Scheme on the surrounding environment including within Noise Important Areas[2] and Air Quality Management Areas[3]

[2] Air Quality Management Areas are locations identified by local authorities where specific measures are needed to reduce emissions in order to meet the United Kingdom's air quality objectives.

[3] Noise Important Areas are areas that have been identified as experiencing particularly high road traffic noise levels.

- Support future economic growth across the Greater Manchester area by delivering against local aspirations set out in regional and local authorities' transport strategies and local plans

2.3 Environmental context

2.3.1 The Scheme design has been an iterative process that has considered environmental mitigation measures and buildability to develop an economic solution and a good road design that is sensitive to the context of its surroundings and the communities that surround it. Key environmental constraints considered during this process are shown in Figure 2: Key Environmental Constraints, and include but are not limited to, the following:

- The Greater Manchester Air Quality Management Area, located within the Order Limits[4].
- Noise Important Areas covering M60 J17 and J18 and sections of the adjacent motorways.
- Heaton Park Registered Park and Garden[5], located adjacent to the Order Limits between M60 J18 and J19.
- Listed buildings[6] located within the study area for the cultural heritage assessment.
- Ecological sites located adjacent to or near to the Order Limits, including Sites of Biological Importance[7], Local Nature Reserves[8], habitats of importance such as ancient woodland, and protected or notable species such as great crested newt, bats, wintering and ground nesting birds, badgers, and invasive species such as Japanese knotweed.

[4] The Order Limits are the limits of land to be acquired or used permanently or temporarily within which the Scheme may be carried out.

[5] A Registered park and garden is a historic park and/or garden on the Register of Historic Parks and Gardens of Special Historic Interest in England.

[6] Listed buildings are buildings of special architectural and historic interest listed on the National Heritage List for England.

[7] Sites of Biological Importance are not legally protected but are designated in order to protected local sites of biological diversity.

[8] Local Nature Reserves are legally protected ecological sites designated for their local scientific interest.

- Ecological sites located within 200 metres of the network of affected roads[9], including Rochdale Canal Special Area of Conservation[10] and Site of Special Scientific Interest[11].
- Green Belt[12] land, located within the Order Limits around M60 J18 (extending north, south and east of the junction), and a Special Landscape Area[13] located within the Order Limits north-east of M60 J18.
- Several Public Rights of Way[14] and the Haweswater Aqueduct underpass permissive path[15] located within the Order Limits.
- Watercourses located within or near to the Order Limits.
- The settlements of Unsworth, Simister, Whitefield, Prestwich and Kirkhams, located close to the Scheme, with some residential dwellings located adjacent to or in close proximity to the Order Limits.
- Educational facilities such as Unsworth Academy, Parrenthorn High School and St Margaret's Church of England Primary School located close to the Order Limits.
- Community facilities such as Pike Fold Golf Club and Unsworth Cricket Club, located within or adjacent to the Order Limits.

2.3.2 The baseline environment for the Environmental Impact Assessment is discussed further in Chapter 3 of this document.

[9] The network of affected roads is defined by the traffic modelling undertaken for the Scheme.

[10] Special Areas of Conservation are legally protected to protect and conserve sites of European interest for biodiversity.

[11] Sites of Special Scientific Interest are legally protected sites of ecological and/or geological interest.

[12] The purpose of Green Belt land is to safeguard open land from urban sprawl.

[13] Special Landscape Areas are landscapes designated for their local importance, e.g. environmental, cultural or visual importance.

[14] A Public Right of Way is a footpath with a right of way that allows the public to walk along it.

[15] A permissive path is a footpath that the public are allowed to use because the person who privately owns the land has made the route available to the public.

2.4 Scheme design

2.4.1 The key elements of the Scheme, as shown in Figure 3: Overview of the Scheme Design, are:

- Widening of the M60 carriageway between J17 and J18 from four lanes to five lanes in both directions and installation of a new hard shoulder. By introducing this layout, traffic joining the M60 at one junction and leaving at the next would not have to change lanes.
- Construction of a new loop road (the 'Northern Loop') to provide a new link between the M60 eastbound to the M60 southbound. This would allow drivers to continue along the M60 without having to leave the motorway, navigate the roundabout and re-join the M60.
- Widening of the M66 southbound through J18 from two lanes to four lanes.
- Widening of the existing M60 northbound to M60 westbound link road from one lane to two lanes.
- Realignment of the approach to the M60 eastbound to M66 northbound link road as the M66 eastbound off-slip road to the J18 roundabout would be closed for general use.
- Realignment of the M66 southbound slip road to J18 to accommodate the Northern Loop, including a new overbridge where the slip road crosses the Northern Loop and realignment of the left turn lane to the M62 eastbound.
- Realignment of the existing M62 westbound to M60 southbound link road.
- Renewal of signs and signals, including new signs and street lighting at M60 J18 and its approaches, renewed traffic signals at the M60 J18 roundabout, and new gantries on the M66 southbound side and between M60 J17 to J18.
- Construction of associated drainage works including new ponds to accommodate surface water run-off from the highway and improve water quality.

2.5 Environmental input to the design process

2.5.1 The Scheme includes a range of measures that have been developed to avoid, prevent, reduce or offset likely significant adverse environmental effects. This includes measures such as changing the road's height and layout, reducing the temporary and permanent areas of the Scheme, and altering construction methods.

2.5.2 Environmental considerations have been a key factor in developing the Scheme. Environmental design principles include, but are not limited to, the following:

- Retain as much existing vegetation as feasible, including where it provides important visual screening or forms part of the landscape structure. Where vegetation loss is unavoidable, and where practicable, replace and extend areas of planting into the landscape to provide visual screening.
- Maximise biodiversity value throughout the Scheme and improve wildlife connectivity by incorporating habitats such as hedgerows and lines of trees, linking with retained woodland and hedgerows where possible.
- Reinforce the landscape character and pattern, and biodiversity, by planting native tree and hedge species typically found within the surrounding local landscape.
- Aim to limit the overall area of the Scheme as much as possible, including when considering the design and location of ponds.
- Integrate earthworks sensitively into the surrounding landscape and plan appropriate planting around the features.
- Careful design of structures, signage and gantries to help integrate these into the wider landscape.
- Sensitive design of ponds and swales, to integrate these features into the landscape and provide greater biodiversity enhancement.
- Provide visual interest for local residents, users of Public Rights of Way and users of greenspace.

2.5.3 Further control measures are contained within the First Iteration Environmental Management Plan, which is Volume 6.5 of the Development Consent Order application. The First Iteration Environmental Management Plan details all the mitigation measures for the Scheme which will be implemented by the Applicant and the Principal Contractor before, during and after construction.

2.6 Construction

Construction programme

2.6.1 The Scheme would take approximately three years to construct. An outline construction programme has been developed, with key milestones outlined below:

- Mobilisation[16] to site – Quarter (Q)4 2025
- Start of works – Q1 2026
- M66 southbound diverge traffic switch – Q1 2028
- Northern Loop traffic switch – Q3 2028
- Open for traffic – Q1 2029
- Demobilisation from site – Q2 2029

2.6.2 The Scheme comprises elements of 'online' works, which require working on and directly adjacent to the existing motorway carriageways, and 'offline' works, which are located remotely from the current road alignments. Both online and offline works would likely be carried out concurrently.

Site compounds

2.6.3 The main site compound would be located to the north-west of M60 J18 in land south of Mode Hill Lane and Cowl Gate Farm. This compound would be the main base for the construction team on site, with provision for the main offices, site welfare facilities (toilets and washing facilities, for example), vehicle recovery, staff parking, and a materials storage area. Construction staff would access the site compound via Mode Hill Lane during the mobilisation phase only, and via a temporary haul road off the M60 eastbound to M66 northbound link to allow construction vehicles to transport construction materials during the construction phase. Access via Mode Hill Lane would remain an option for private cars accessing the site office throughout the construction period.

2.6.4 In addition to the main site compound, there would be several smaller site compounds to help reduce the number of staff making journeys on and around M60 J18 on a daily basis. These smaller site compounds would be located:

- North of M60 J18 in land north of Pike Fold Golf Club. Access would be via Griffe Lane to undertake main works.
- North-east of M60 J18 in land south of Pike Fold Golf Club. Access would be via Egypt Lane for the mobilisation phase only, then via the M66 southbound.
- South-west of M60 J18, adjacent to the M60 eastbound to M60 southbound link in land north of Simister Lane. Access would be via a road off Simister Lane for the mobilisation phase only then via the M60 northbound to M60 westbound link.

[16] The mobilisation period is reserved for setting up temporary construction compounds, the diversion and protection of utility services (where required), archaeological mitigation (if required) and the implementation of other required environmental mitigation (such as protected species mitigation (if required)) before the main construction works could commence.

- Between M60 J18 and J19, south of the motorway, in a field north of Heaton Park. Access would be via the M60 motorway using a 24/7 hard shoulder closure.

Construction noise and working hours

2.6.5 During major construction work there are many sources of noise. These can include the movement and operation of construction vehicles, and the operation of heavy machinery. To help reduce the impacts of our construction work, steps would be taken such as timing construction to minimise work outside normal working hours where possible, using low-noise equipment and temporary noise barriers.

2.6.6 Construction work in most areas would be carried out during normal daytime working hours, which would be between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturday. In addition, there may be an hour before or after these times for site set up and close down (this would include activities such as deliveries, movement to place of work and general preparation works, but would not include the operation of machinery or plant). During the summer months, working hours could extend from 7am to 9pm to make use of the longer daylight hours. These are standard working hours for infrastructure projects across the country.

2.6.7 Work done outside of these hours or on bank holidays is considered off-peak work. There would be works that need to be done at night or at weekends. There are several reasons for this, such as limiting the disruption to motorists using the motorway, or for safety reasons where there would be construction of new bridges or gantries over the motorway. Evening and night working hours would be from 7pm to 7am Monday to Saturday. Saturday off-peak working hours would be from 1pm to 7pm, and Sunday and public holiday off-peak working hours would be 7am to 9pm for daytime works and 9pm to 7am for night-time working.

2.6.8 The exact details of construction working hours would be discussed with the local authorities in advance of the works taking place.

Traffic management

2.6.9 Temporary access would be required off the motorway to access the offline works areas, as the local road network is not suitable in some areas for the expected number and type of construction vehicles that would be needed for construction.

2.6.10 Some access from the local road network would be required to gain entry for construction traffic to the offline work areas during the early stages of the Scheme. This would include access off Mode Hill Lane, Griffe Lane, Simister Lane and Egypt Lane. This may involve some limited disruption to these roads, however, access for residents would be maintained throughout.

2.6.11 The existing motorways would generally be kept open during peak hours during construction of the Scheme to avoid significant disruption to the road user. However, where construction activities prohibit safe road operation, off peak lane closures and carriageway closures would be required.

2.6.12 Closures would include combinations of single carriageways, both carriageways, slip roads and link roads. These closures would happen at night-time, and possibly over weekends, to minimise disruption. Suitable diversion routes would be put in place for motorway traffic, and existing diversion routes currently used by the Applicant would be utilised for the Scheme. Where the local road network is to be used for diversions the details would be agreed with the local highways authorities during the detailed temporary traffic management design phase prior to the start of construction.

2.6.13 To reduce the volume of site traffic on the road, shuttle buses would be used to take workers from the main site compound to work fronts, the smaller site compounds and laydown areas, where feasible.

2.6.14 Traffic management (for example, temporary traffic lights, lane closures, contraflows and overnight road closures) would be included in a Traffic Management Plan. An Outline Traffic Management Plan has been submitted with the Development Consent Order application.

Environmental management

2.6.15 All construction work would be done with appropriate environmental controls in place. A First Iteration Environmental Management Plan has been submitted with the Development Consent Order application. This document contains details of measures to manage environmental effects in construction and operation, and includes specific controls for the construction phase such as:

- Control of noise, dust and other emissions.
- Temporary drainage and treatment facilities to protect watercourses from potential pollution.
- Restricting construction work to normal daytime hours and avoiding night-time working unless absolutely required to avoid major disruption to road users during the daytime.
- Controlling lights used in construction compounds and working areas.
- Managing construction compounds to minimise effects on sensitive environmental features and residential areas.
- Establishing buffers and work-free zones to protect environmental features.

2.6.16 The First Iteration Environmental Management Plan submitted with the Development Consent Order application also contains several outline topic-specific management plans, including an Outline Air Quality and Dust Management Plan, Outline Noise and Vibration Management Plan, Outline Landscape and Ecological Management Plan, Outline Contaminated Land Management Plan, and Outline Carbon Management Plan.

2.6.17 The First Iteration Environmental Management Plan would be developed into a Second Iteration Environmental Management Plan for implementation during construction of the Scheme. The Second Iteration Environmental Management Plan must be substantially based on the First Iteration Environmental Management Plan.

2.7 Scheme development and alternatives considered

2.7.1 The M60 J18 was identified in the Highways Agency's Route Based Evidence Strategy Report (published in 2014) as a key junction capacity issue on the strategic route network[17]. The Scheme has been in development since then, with a large number of junction improvement options considered and factors such as environmental impacts, engineering feasibility, and cost taken into account.

2.7.2 148 potential improvement options were identified for the Scheme in 2015, with five options initially taken forward for further assessment. After further consideration two options were taken forward and two further variants were identified. In 2019 two of these four variants, the 'Inner Links' and 'Northern Loop' options (see Plates 2.2 and 2.3), were selected for public consultation.

2.7.3 During the consultation in 2020, respondents agreed that there was a need to improve traffic flows through the junction. There was a clear preference for the Northern Loop option as a means of achieving this, with over two-thirds of respondents preferring the Northern Loop option.

2.7.4 The Northern Loop option was selected as the preferred option and a preferred route announcement was made on 27 January 2021. Several criteria were considered, including the scheme objectives, safety, benefits, costs, environmental effects, construction and feedback from the public consultation. While both the Inner Links and Northern Loop options would meet the scheme objectives, the Northern Loop would provide greater capacity improvements and journey time savings for road users when compared to the Inner Links. These benefits, therefore, will be felt for longer into the future, as predicted traffic levels continue to grow and thus ensure that the strategic road network will function efficiently for longer into the future as predicted traffic levels continue to grow.

[17] The strategic route network comprises motorways and major A roads.

Plate 2.2 Inner Links option presented at public consultation

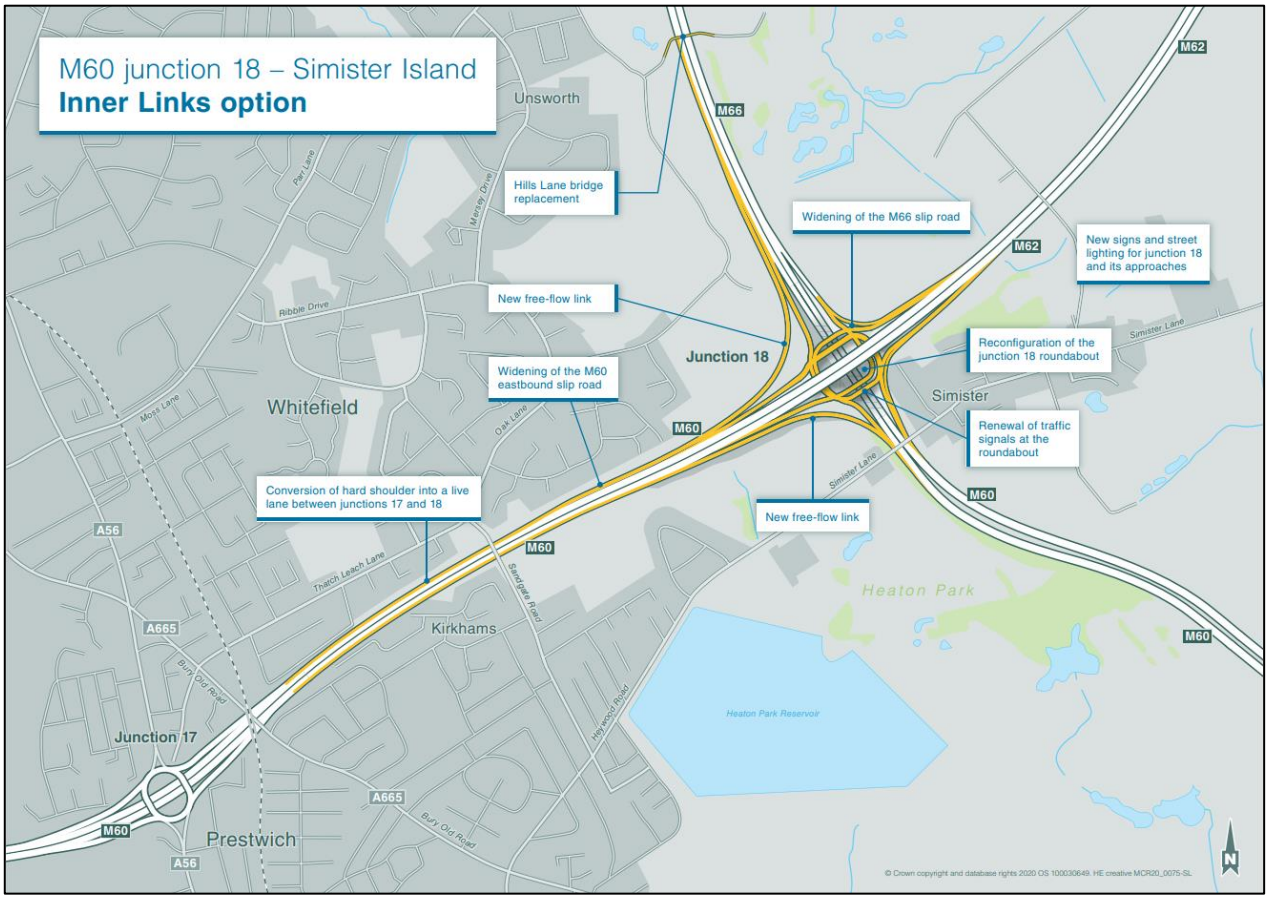
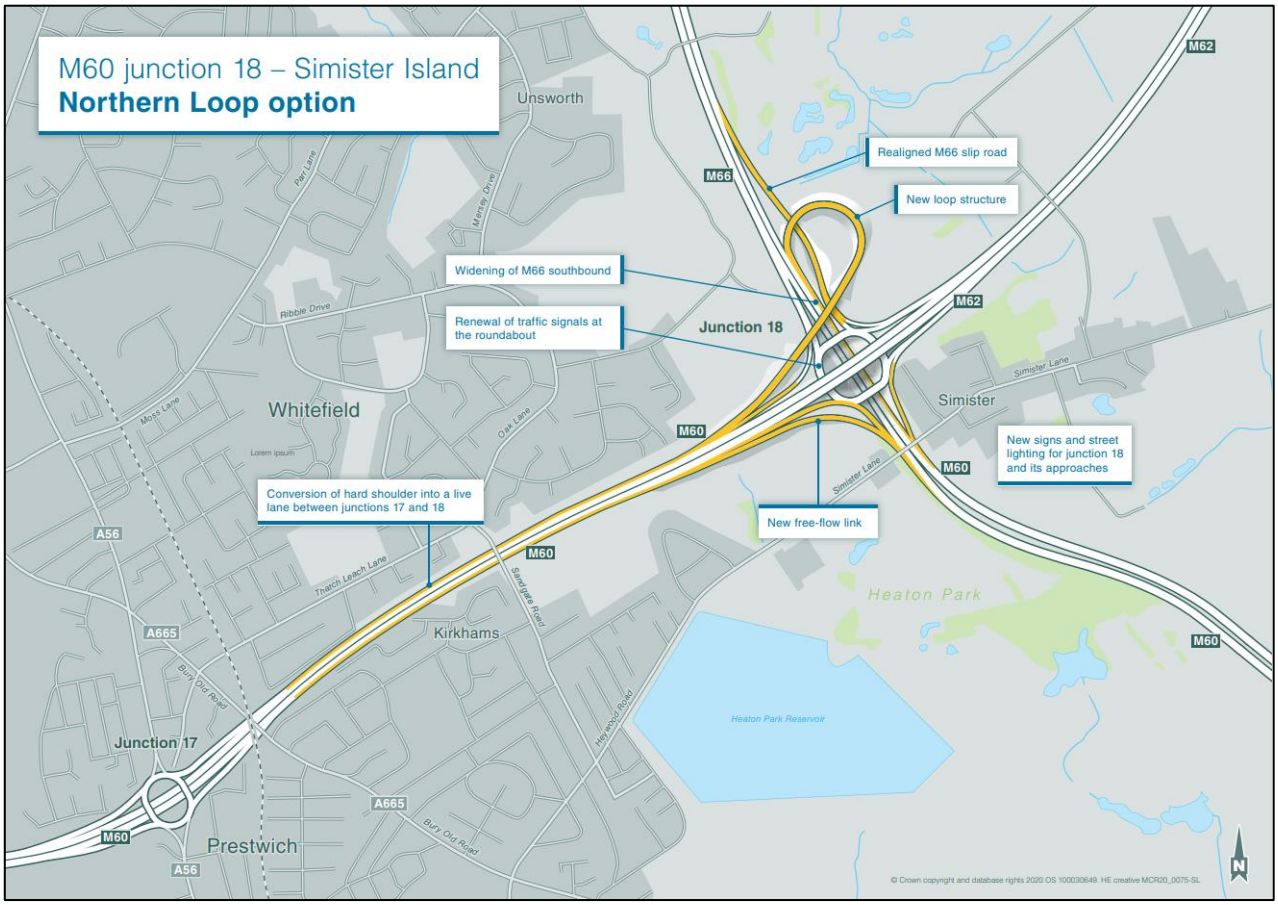


Plate 2.3 Northern Loop option presented at public consultation



2.7.5 Following the preferred route announcement, the design of the Scheme has been further refined as a result of further studies (including environmental assessment) and public consultation. Changes to the highways design from the preferred route announcement include, but are not limited to, the following:

- Incorporation of hard shoulder between M60 J17 to J18, and modification of lane provisions and cross-sections to optimise the available motorway verge. These changes increase the capacity of the motorway and improve the current coverage of hard shoulder between M60 J17 to J18.
- Modification of the height of the M66 southbound diverge so that the M66 southbound diverge goes onto a bridge over the Northern Loop, rather than under it. This change reduces the volume of earthworks and construction materials required to build the Scheme and improves safety by providing road users with greater visibility of the road around the Northern Loop and on the approach to the slip road.
- Removal of the offline M60 northbound to M60 westbound link, to maintain and widen the existing link to two lanes. This change delivers the same traffic capacity while minimising environmental impacts by reducing the amount of land that is required to build the Scheme.

3 Assessment of likely significant effects

3.1 Approach to the assessment

Environmental scoping

3.1.1 An Environmental Scoping Report was produced to document the scope of the environmental assessment, including a description of the aspects and matters to be included in the Environmental Statement. This report was submitted to the Planning Inspectorate on 2 July 2021. The Planning Inspectorate reviewed and consulted on the Environmental Scoping Report and published a Scoping Opinion on 12 August 2021. The Environmental Scoping Report and Scoping Opinion can be found at Volumes 6.6 and 6.7 of the Development Consent Order application, respectively.

Statutory consultation

3.1.2 A statutory consultation was held between 15 February and 28 March 2023. National Highways consulted with consultees including Natural England, the Environment Agency, Historic England, the relevant planning authorities, and other interested parties such as landowners and tenants, the local community and the wider public.

3.1.3 A Preliminary Environmental Information Report was produced to support the statutory consultation. Its purpose was to help members of the public, consultees and other stakeholders to develop an informed view of the Scheme. The report represented a ‘snapshot in time’ of the ongoing environmental assessment process. The Preliminary Environmental Information Report is included in Annex L of the Consultation Report Annexes (Volume 5.2) submitted as part of the Development Consent Order application.

3.1.4 A further supplementary consultation was held between 31 July and 10 September 2023 to inform affected stakeholders of the updates and changes to the Scheme since the statutory consultation and allow them to provide feedback.

3.1.5 A Consultation Report has been produced to summarise the feedback received during the consultations and to demonstrate how the project team have considered this feedback in the Scheme design. The Consultation Report has been submitted as part of the Development Consent Order application (Volume 5.1).

Assessment methods

3.1.6 The Environmental Impact Assessment has followed industry standard methods, including for establishing significance, that are set out in the National Highways Design Manual for Roads and Bridges along with topic-specific guidance as appropriate. Each aspect chapter in the Environmental Statement provides further detail regarding the specific methodology applied.

3.1.7 The Environmental Impact Assessment (as documented in the Environmental Statement) has followed a series of key steps:

a. Identification of the study area and the receptors to be assessed. Receptors range from people, properties and ecological species to the surrounding environment and its resources.

b. Information on the existing environment collected using methods such as field surveys, desk-based studies, and consultation with environmental groups and the public.

c. Potential impacts identified.

d. Mitigation measures set out to avoid, reduce or offset potential adverse impacts.

e. Likely significant environmental effects identified, considering whether effects would be beneficial or adverse, permanent or temporary and taking mitigation measures into account.

f. Requirements for monitoring of mitigation measures identified.

3.1.8 The Environmental Statement also takes into account how and when the existing environment could change over time if the Scheme were not built.

3.1.9 Environmental surveys have been carried out to inform the environmental assessment. These include ecology surveys (including for habitats, bats, birds, badgers, and great crested newts), landscape winter and summer surveys, tree surveys, air quality monitoring, noise monitoring, soil surveys, and ground investigation surveys.

3.1.10 In addition to surveys, other predictive techniques have been used to inform the Environmental Impact Assessment, such as air quality, noise and flood risk modelling (computer generated simulations).

3.1.11 The Environmental Statement covers the following environmental aspects: air quality; cultural heritage (including archaeology and built heritage); landscape and visual; biodiversity; geology and soils; material assets and waste; noise and vibration; population and human health; road drainage and the water environment; climate; the interrelationship between these aspects (combined effects), and the potential interactions between the Scheme and other reasonably foreseeable developments (cumulative effects). The conclusions from the assessment of these aspects are summarised in the following sections of this document.

3.1.12 In line with regulatory requirements, the Environmental Statement has also considered:

- Heat and radiation (whether the Scheme would generate heat or introduce new sources of radiation)
- The risk of major accidents and disasters occurring (for example, severe flooding or storms, a major transport incident or critical infrastructure failure) and the Scheme's potential vulnerability to, or introduction of, major accidents and disasters
- Effects resulting from the Scheme that could potentially affect another European Economic Area state (known as transboundary effects)

3.1.13 The assessment of the aspects listed above (paragraph 3.1.12) has identified that the Scheme is unlikely to result in any likely significant effects, so these aspects were not assessed further.

3.1.14 Demolition of the Scheme is not considered in the assessment, as it is considered highly unlikely that the Scheme would be decommissioned before the end of its design life of 60 years, as the road would have become an integral part of the strategic road network. In the event of the Scheme needing to be demolished, this would conform to the legal process at that time, including Environmental Impact Assessment if required.

3.2 Air quality

Introduction

3.2.1 Air pollution is associated with adverse health impacts and is recognised as a contributing factor in the onset of conditions such as heart disease and cancer. In certain circumstances air pollution may adversely affect ecosystems either directly or indirectly through elevated nitrogen deposition (the transfer of nitrogen pollutants from the atmosphere to land and water bodies).

3.2.2 The air quality assessment considers levels of nitrogen dioxide (NO_2) and particulate matter (referred to as PM_{10} or $PM_{2.5}$, depending on the size of the particles). These levels are compared to objectives and limit values that have been set in UK legislation based on the effects of each pollutant on health and on the environment. If air quality levels are higher than the objectives or limit values, the term ‘exceedance’ is used. For ecological sites the air quality assessment also considers nitrogen deposition and the change in nitrogen deposition.

3.2.3 The study areas for the air quality assessments during construction and operation are based on traffic modelling results, which enabled a network of affected roads to be defined. Features sensitive to air pollution, such as residential properties and ecological sites, within 200 metres of the network of affected roads were identified. Modelling was then undertaken at those features where the highest and/or largest changes in air pollutant concentrations were considered likely to occur. Changes in annual mean concentrations of nitrogen dioxide and particulate matter at human receptors were assessed in comparison to the air quality objective. The risk of exceeding the limit value for nitrogen dioxide and particulate matter at the roadside or for a significant increase in nitrogen deposition[18] at ecological receptors were also assessed.

[18] Nitrogen deposition is the transfer of nitrogen from the atmosphere to vegetation and habitats.

Baseline environment

3.2.4 The existing air quality within the study area has been evaluated based on local authority, Highways England (now National Highways) and Transport for Greater Manchester air quality monitoring data collected between 2015 and 2021. Additional temporary monitoring sites were also installed along the Scheme route and in the general vicinity in 2021, which were then statistically converted to 2018, taking into account Covid-19 restrictions. This monitoring recorded potential exceedances of the nitrogen dioxide air quality objective at a number of locations within 1 kilometre of the network of affected roads.

3.2.5 There is one AQMA for the whole of Greater Manchester covering the Scheme and a number of other key roads in the area. In addition, both the Greater Manchester Combined Authority and National Highways have identified exceedances of the nitrogen dioxide limit value adjacent to roads likely to be affected by the Scheme. However, by the opening year of the Scheme (2029), compliance with the limit value is projected to be achieved.

3.2.6 Air quality is generally expected to improve in the future as vehicle emissions improve and the use of electric vehicles becomes more widespread.

Effects during construction

3.2.7 The assessment has identified that there are some locations where air quality is worsened and some where it is improved, however, the vast majority of locations improve as traffic is re-routed away from the affected roads and dispersed over a wider area. There are no new or worsened exceedances of the relevant air quality objectives or limit values with the Scheme in place. The largest improvements in air quality are modelled to occur close to the Scheme. The overall effect of the construction of the Scheme on air quality at human receptors from road traffic is considered **not significant**.

3.2.8 The nitrogen deposition assessment showed an improvement at most sites during construction. The nitrogen deposition assessment also showed that that there is the potential for significant effects to occur at two ecological sites during construction. Effects on these sites are further assessed in the biodiversity chapter of the Environmental Statement, and the biodiversity assessment has concluded that there would be **no significant effects** on these ecological sites (see Section 3.5 of this document for further details).

3.2.9 The air quality model confirmed that concentrations of nitrogen dioxide at specific roadside locations used to report on compliance with air quality limit values are within the acceptable value set in law. Concentrations of particulate matter at these locations are also below the relevant limit values.

3.2.10 The impact of construction dust during construction is considered to be 'high' risk. Well established mitigation measures have been included in the Outline Air Quality and Dust Management Plan submitted with the Development Consent Order application and would be used to control dust emissions during construction. These measures include dampening down of surfaces, planning the site layout so that dust-causing activities would occur as far from human and ecological features as possible, and erecting screens or barriers around dust-causing activities. With these measures in place, there would be **no significant effects** resulting from dust.

Effects during operation

3.2.11 The assessment has identified that there are some locations where air quality is worsened and some where it is improved. There are no exceedances of the relevant air quality objectives or limit values with the Scheme in place. The largest improvements in air quality are modelled to occur at a small number of receptors which have some of the highest modelled concentrations without the Scheme in the opening year of the Scheme (2029). These improvements are modelled to occur as a result of a reduction in congestion associated with the Scheme. The overall effect of the operation of the Scheme on air quality at human receptors is considered **not significant**.

3.2.12 The nitrogen deposition assessment showed that that there is the potential for significant effects to occur at eight ecological sites during operation. Effects on these sites are further assessed in the biodiversity chapter of the Environmental Statement, and the biodiversity assessment has concluded that there would be **no significant effects** on these ecological sites (see Section 3.5 of this document for further details).

3.2.13 The air quality model confirmed that concentrations of nitrogen dioxide at specific roadside locations used to report on compliance with air quality limit values are within the acceptable value set in law. Particulate matter at these locations are also below the relevant limit values too.

3.3 Cultural heritage

Introduction

3.3.1 Cultural heritage includes archaeological remains, historic buildings and other structures, and historic designed landscapes like historic parks and gardens. The cultural heritage assessment considers the impacts to archaeological remains from construction, together with the way in which heritage assets such as historic buildings and parks and gardens can be affected by changes to their setting.

Baseline environment

3.3.2 To understand archaeological remains which are not legally protected (non-designated), a study area which includes the area within the Order Limits and a zone extending 500 metres from the edge of that boundary has been applied. For designated (protected by law or in the planning process) heritage assets, such as listed buildings, scheduled monuments and registered parks and gardens, a 1 kilometre study area has been used to take into account an asset's setting (the surroundings in which the historic asset is experienced). The landscape and visual study (see Section 3.4 for further details) has also been used to understand how setting might be affected.

3.3.3 A cultural heritage walkover survey has been carried out to locate the recorded position of archaeological remains from local datasets and understand the visual setting of historic buildings and parks and gardens.

3.3.4 There are no designated heritage assets located within the Order Limits. The study area for designated assets contains 13 listed buildings, three Conservation Areas[19], and one Registered Park and Garden (Heaton Park), which abuts the Order Limits to the south of M60 J18 near where a pond will be implemented.

3.3.5 There are six non-designated archaeological sites within the Order Limits including those overlapping into them. The extent to which these sites have survived is unknown. There are a further 78 non-designated archaeological assets and 35 non-designated historic buildings within 500 metres of the Order Limits. Two of these are adjacent to the Order Limits at M60 J18.

Effects during construction

3.3.6 There would not be any physical impacts to designated heritage assets during construction, as they are too far away from the area affected by construction activity to be physically affected. This includes Heaton Park Registered Park and Garden. The listed building Brick Farmhouse would experience some changes to its setting from additional noise, dust, and lighting associated with the construction of a pond. This would be a temporary **slight adverse (not significant) effect**.

3.3.7 Two non-designated historic buildings adjacent to M60 J18 would experience some changes to their setting from the presence of construction compounds or additional noise, dust, vibration and lighting during construction works. This would be a temporary **slight adverse (not significant) effect**.

[19] Conservation Areas are areas designated by local authorities for special historic or architectural interest.

3.3.8 Physical impacts would occur to the known archaeological assets within the Order Limits. This would also apply to archaeological remains that are presently unknown. The adverse effects arising from these physical impacts can be offset by implementing mitigation such as preserving any archaeological remains by record prior to construction. Such measures would be informed by a programme of investigation which will determine the presence or absence of such remains and inform a robust mitigation strategy. Investigation would be carried out in accordance with a method statement approved by the Greater Manchester Archaeological Advisory Service.

Effects during operation

3.3.9 There would not be any physical or setting effects on archaeological remains during operation of the Scheme. Therefore, there would be **no significant effects** on archaeological remains during operation.

3.3.10 There would be changes to the setting of two heritage assets in close proximity to the Scheme from new road infrastructure. These assets are the non-designated historic building Cold Gate Farm, and Heaton Park registered park and garden (the change to its visual setting would occur at the northern end of the designation, in an area that has already seen much change historically). These effects would be **slight adverse (not significant)**.

3.4 Landscape and visual

Introduction

3.4.1 An assessment of the effects on landscape character and on people's views that are likely to arise due to the Scheme has been undertaken. The assessment considers landscape and visual effects during construction and operation in year 1 (opening year) and year 15 (design year) (including summer and winter). An assessment of effects is undertaken at year 1 prior to the establishment of planted mitigation, i.e. the worst case when the Scheme becomes operational, and at year 15 when planted mitigation should be sufficiently established to determine its effectiveness.

Baseline environment

3.4.2 Surveys focused on a study area extending to 2 kilometres from the Scheme and were undertaken during summer (September 2021 and October 2022) and winter (March 2021 and December 2022) to inform the landscape and visual assessment.

3.4.3 The landscape within the study area is heavily influenced by the motorway transport corridors, with M60 J18 being the intersection of the M60, M62 and M66 motorways. The urban areas of Whitefield, Unsworth, Prestwich and the settlement of Simister also heavily influence the landscape within the study area.

3.4.4 Motorway infrastructure is visible from within Whitefield and Prestwich in the vicinity of the motorway although views quickly reduce with distance due to intervening residential development; the linear tree belts along the motorway corridors and other groups of vegetation. Directly north and north-east of M60 J18 the landscape is mostly flat and open, and the motorway is visible from rural properties, footpaths and Pike Fold Golf Course, though hedgerows and woodlands limit some near and middle-distance views.

Plate 3.1 View south-west from Griffe Lane across Pike Fold Golf Course towards M60 J18 and the location of the Northern Loop

3.4.5 Motorway lighting is visually prominent from urban areas located near the motorway corridors and M60 J18 and from the more undeveloped rural area to the north and north-east.

3.4.6 Elevated areas within Heaton Park registered park and garden allow some very limited views to the M60 corridor, although woodland within Heaton Park and along the highway boundary provides a high level of screening. The Scheme is not visible from Heaton Park.

3.4.7 Key features within the study area relevant to landscape include three landscape character areas[20], one townscape character area[21], a Special Landscape Area (located east of the M66 and north of the M62 and extending east to Moss Hall Road), Green Belt land, Heaton Park registered park and garden, and other cultural heritage features (refer to Section 3.3), public footpaths, a cycleway and a bridleway.

3.4.8 Potential visual receptors within the study area include:

[20] Landscape Character Areas are geographical areas with a broadly consistent landscape character, e.g. similar landforms, land use or vegetation cover.

[21] Townscape Character Areas are geographical areas with a broadly consistent townscape character, e.g. similar pattern, scale and density of development, similar townscape uses and open space, timeline and cultural influences

- Residents within the settlements of Whitefield, Unsworth, Prestwich and Simister and within the rural area to the north and east of the M60 J18 between the M66 and M62.
- Users of the public rights of way network or other routes used by walkers, cyclists and horse riders, visitors to Heaton Park registered park and garden and open spaces such as Boz Park, visitors to allotments and playing fields, and visitors to Pike Fold Golf Course.
- People at their places of work, such as within nearby schools and businesses on the peripheries of the motorway corridor and also travellers on the road network.

Effects during construction

3.4.9 The Scheme would increase the prominence of major highway infrastructure within the landscape. Landscape Character Area 26: Prettywood, Pilsworth and Unsworth Moss would be significantly affected by construction of the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge and the construction of the M66 southbound diverge. The removal of highway vegetation, land alteration, the siting of material storage areas, and construction activities, such as the construction of embankments, the viaduct, the bridge and ponds, would change the landscape quality and character of the Landscape Character Area and also a part of the Special Landscape Area. These effects would be **moderate adverse (significant) effects**.

Plate 3.2 View west from Egypt Lane towards M60 J18 and the location of the Northern Loop

3.4.10 Road widening would bring traffic closer to residential areas and footpaths and also require removal of linear tree belts. The presence of construction activities, such as construction compounds and earthworks for the construction of the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge and road widening, would be prominent in people's views close to the Scheme. Visual disturbance from the movement of construction plant on haul routes and working areas, temporary construction lighting and the removal of highway vegetation belts on the M60 and M66 would change the nature of views.

3.4.11 The greatest change in people's views from construction activities would occur within residential settlement edges north and south of the M60 to the east of the A655 Old Bury Road, locations in the vicinity of M60 J18, and for individual residential properties within the rural area to the north and north-east. People using footpaths, a cycleway and a bridleway that run close to, or cross, the Scheme would also notice a change in views. These changes would result in **very large, large or moderate adverse (significant) effects** at 17 of the 29 representative viewpoints[22] included in the assessment.

Effects during operation

3.4.12 Once construction activity has ceased and reinstated grass sward has established sufficiently to soften the earthworks, the effects on Landscape Character Area 26: Prettywood, Pilsworth and Unsworth Moss would reduce and there would be **no significant effects** by year 1 of operation. There would be **no significant effects** on the other Landscape or Townscape Character Areas during year 1 of operation, as the operational Scheme would form a very small part of each character area.

3.4.13 During operation in the first winter after the Scheme is open, following completion of all construction but before planted mitigation would have established, there would continue to be **large or moderate** (**significant) adverse effects** on people's views at 16 representative viewpoint locations due to vegetation loss and resulting views of new and existing highways infrastructure (such as the new Northern Loop and new gantries and signage and from clearance of linear tree belts along the M60 mainline). These impacts on views would be significant along residential settlement edges to the north and south of the M60 east of the A665 Bury Old Road, in the vicinity of the M60 J18, for individual residential properties within the rural area to the north and north-east, and also footpaths that run close to, or cross, the Scheme.

[22] A representative viewpoint represents the experience of different types of visual receptors, where large numbers of viewpoints cannot be included individually, with similar significant effects.

3.4.14 The environmental design has aimed to reduce the visual impacts from the Scheme. The assessment shows that by operational year 15, once mitigation planting has sufficiently established to help integrate the Scheme into the landscape and to help screen views of the Scheme, there would remain **moderate (significant) adverse effects** on people's views at one representative viewpoint location along the M60 motorway (residential properties 1 and 2 Warwick Close, 51, 53, 55, 57, 59 and 61 Kenilworth Avenue, and 2 and 4 Barnard Avenue), as vegetation removed could not be reinstated due to the narrowness of the remaining motorway verge and close proximity to the hard shoulder and drainage). There would be **no significant effects** for the remaining representative viewpoints, and there would be slight beneficial effects (improvements on existing views) in some locations around M60 J18, which would be **not significant**.

3.5 Biodiversity

Introduction

3.5.1 Biodiversity is the study of living organisms and their relationship with each other and their environment. A biodiversity assessment has been undertaken, focussing on three main areas of study: designated (protected) sites; priority (important) habitats; and protected and notable species of plants and animals. Extensive surveys and desk studies have been undertaken to inform the assessment.

Baseline environment

3.5.2 The study area for Special Areas of Conservation extends up to 30 kilometres around the Order Limits for Special Areas of Conservation designated for bats, any site with hydrological connectivity, sites within 200 metres of the network of affected roads being assessed for changes in air quality (refer to Section 3.2 for further details), and any other site within 2 kilometres of the Scheme. Rochdale Canal Special Areas of Conservation (also a Site of Special Scientific Interest) is the only Special Areas of Conservation within the study area, located 5 kilometres east of the Order Limits and within 200 metres of the network of affected roads. The SAC is designated for its population of one particular plant called water plantain.

3.5.3 There are no Sites of Special Scientific Interest within the study area of 2 kilometres, though, as noted above, Rochdale Canal (a Site of Special Scientific Interest) is located within 200 metres of the network of affected roads. Two Sites of Special Scientific Interest (Ashclough, and Nob End) are hydrologically connected to the Scheme via the River Irwell and the River Roch and its various tributaries.

3.5.4 The study area for Local Nature Reserves is 2 kilometres, with additional sites included where they are within 200 metres of the network of affected roads. There are five Local Natures Reserves within the study area (Hollins Vale, Mere Clough, Philips Park, Blackley Forest, and Alkrington Woods) and there are four Local Nature Reserves within 200 metres of the network of affected roads. There are also two Local Nature Reserves located outside of the study area but which have hydrological connectivity with the Scheme (Nob End, and Moses Gate). The nearest Local Nature Reserve to the Scheme is Hollins Vale, located 30 metres west of the Order Limits.

3.5.5 There are eight Sites of Biological Importance within the study area of 1 kilometre, and 11 Sites of Biological Importance within 200 metres of the network of affected roads. The nearest Site of Biological Importance to the Scheme is Hazlitt Wood, located approximately 3 metres south-east of the Order Limits.

3.5.6 There are two ancient woodland[23] inventory sites located within the study area of 1 kilometre, and four sites within 200 metres of the network of affected roads. The nearest ancient woodland inventory site is Mere Clough, located 470 metres west of the Order Limits.

3.5.7 There are priority habitats[24] located within the study area of 1 kilometre. These habitats include types of grassland and mixed deciduous woodland, lowland fens, traditional orchards, hedgerows and eutrophic standing water. There are areas of deciduous woodland (trees that shed their leaves every year) located along the existing motorway verges within the Order Limits. There are also nine areas of groundwater dependent terrestrial ecosystems[25] located within the study area of 250 metres.

3.5.8 Field surveys and desk-based research have indicated that the area within 2 kilometres of the Order Limits is used by a range of protected and notable species, including bats, badgers, otters, various breeding and winter birds, reptiles such as slow worm and common lizard, great crested newts, common toad, brown hare, hedgehog, and terrestrial (land) invertebrates[26].

[23] Ancient woodland is an area of woodland that have persisted since 1600.

[24] A priority habitat is a habitat type that has been identified as being the most threatened and requiring conservation action.

[25] Groundwater dependent terrestrial ecosystems are habitats that are potentially dependent on groundwater.

[26] Invertebrates are animals without a backbone or bony skeleton.

Plate 3.3 Great crested newt found during a survey

Plate 3.4 Example of ponds present in the area

Effects during construction

3.5.9 Effects on biodiversity during construction can include direct removal of vegetation (resulting in habitat loss), disturbance of species (such as from noise or vibration), and changes in air quality and deposition of dust.

3.5.10 There would be **no significant effects** on designated sites, priority habitats and other habitats during construction. The assessment has shown that there are **no effects** (due to there being no pathway to an effect) or **neutral effects** on most designated sites, priority habitats and other habitats. There would be **slight adverse (not significant) effects** on Ashclough and Nob End Sites of Special Scientific Interest, Hazlitt Wood Site of Biological Importance, and some priority habitats (lowland mixed deciduous woodland, eutrophic standing water[27], and hedgerows), due to impacts including potential pollution of surface water and groundwater, habitat loss, and changes in groundwater flow during construction.

3.5.11 Mitigation measures and best practice measures would be employed during construction, and these would reduce potential impacts (such as changes in noise, deposition of dust, and pollution of surface water and groundwater) to a not significant level. Habitat lost would be replaced and enhanced so that there would be an overall beneficial offset and a gain in habitat once planting has matured (an approximate increase of 3.68% in habitat units[28] within the Order Limits and an increase of 58.5% in hedgerow units within the Order Limits).

3.5.12 There would be **no significant effects** on protected and notable species during construction. The assessment has shown that there are **no effects** (due to there being no pathway to an effect) or **neutral effects** on most protected and notable species. There would be **slight adverse (not significant) effects** on freshwater species (due to potential pollution of surface water during construction), and barn owl (due to loss of foraging habitat). There would be measures in place during the construction phase to avoid death or injury to wildlife, as well as avoiding fragmentation of habitats and disturbance. This would include constructing exclusion areas around important features and habitats. There would be loss of terrestrial habitat used by great crested newts, however measures would be put in place to ensure that great crested newts remain in a favourable conservation status through District Level Licensing[29].

Effects during operation

3.5.13 There would be **no significant effects** on designated sites, priority habitats and other habitats during operation. The assessment has shown that there are **no effects** (due to there being no pathway to an effect) or **neutral effects** on most designated sites, priority habitats and other habitats. There would be **slight adverse (not significant) effects** on the Clifton Woods ancient woodland inventory site due to an increase in nitrogen deposition from vehicle emissions potentially affecting habitats.

[27] Eutrophic standing water is still water rich in nutrients, such as ponds, lakes, canals, gravel pits and reservoirs.

[28] A unit is a measurement of biodiversity value taking into account the habitat type, size, condition and location.

[29] District Level Licensing is a Natural England scheme that helps to better protect great crested newts by funding the creation of ponds in areas where great crested newts will benefit the most.

3.5.14 There would be **no significant effects** on protected and notable species during operation. The assessment has shown that there would be **slight adverse (not significant) effects** on bats, badger, barn owl, breeding and wintering birds, brown hare, hedgehog, water shrew and common toad, due to potential risk of mortality from entanglement with the golf ball netting at Pike Fold Golf Course. There would be **no effects** (due to there being no pathway to an effect) or **neutral effects** on other protected and notable species.

3.5.15 The design of the Scheme (including sensitive lighting design, use of a low noise surfacing, and improvements on some existing drainage arrangements) would reduce potential impacts during operation.

3.6 Geology and soils

Introduction

3.6.1 A geology and soils assessment has been undertaken, focussing on geology (including bedrock geology[30], superficial deposits[31], and geological designations), soil resources and land contamination (including risks to human health and waterbodies).

3.6.2 To support the assessment, surveys have been undertaken, including an agricultural land classification survey, and ground investigations.

Baseline environment

3.6.3 The geology and soils assessment has used a study area of 250 metres around the Order Limits, which is considered to represent the distance over which contamination can move and where effects on soils or geological features may occur.

3.6.4 There are no Sites of Special Scientific Interest designated for geology within the study area.

3.6.5 The bedrock geology underlying the geology and soils study area comprises rocks laid down between approximately 360 and 250 million years ago and include rocks notable for the amount of coal contained within them. On top of the bedrock geology are relatively young glacial deposits, topsoil and peaty soil (in some locations). Some of the rock units have aquifers (bodies of rock or sediment that hold water) that support local water supplies, such as the Chester Sand Formation.

[30] Bedrock geology is the main layers of rock that form the Earth.

[31] Superficial deposits are ‘young’ deposits of rocks usually laid on top of the bedrock geology.

3.6.6 The area within the Order Limits contains a mixture of soils from poor quality to very good quality. These soils have been assigned a classification following agricultural land classification surveys. The majority of the land surveyed within the Order Limits is classified as non-agricultural land (56.5%), followed by soils of moderate quality (these are Grade 3b soils; 30.5%). Approximately 5.5% of the land surveyed within the Order Limits is classified as Best and Most Versatile agricultural land[32] (these are Grade 2 and Grade 3a soils).

3.6.7 Made ground[33] was identified during the ground investigations, including asbestos fibres in some locations, and made ground along the carriageway and raised ground to the north-east of M60 J18. Historical mining of coal may have occurred at the site, and gravel and sand pits have been noted on historical maps. In addition, there are three historical landfills located directly east and west of the M60. Inert (un-reactive) waste deposited between 1993 and 1999 is probably associated with construction of the M62/M60.

Effects during construction

3.6.8 There would be a **moderate adverse (significant) effect** on soils due to permanent and/or temporary land take requirements for the Scheme. There would be a permanent loss of approximately 2.3 hectares of Grade 2 and Grade 3a Best and Most Versatile land (approximately 2.7% of the Order Limits). There would be a permanent loss of approximately 17.3 hectares of Grade 3b soils of moderate quality (approximately 20.2% of the Order Limits) and a temporary loss of 9.9 hectares of Grade 3b soils of moderate quality (approximately 11.6% of the Order Limits).

3.6.9 There would be **no significant effects** on other geology and soils receptors during construction. Best practice measures and mitigation measures would reduce potential impacts during construction. An Outline Contaminated Land Management Plan, which includes construction techniques to mitigate potential risks to construction workers, residents, and controlled waters, has been submitted with the Development Consent Order application.

Effects during operation

3.6.10 There would be **no significant effects** on geology and soil features during operation. The permanent loss of agricultural land occurring during construction would persist during operation but is not considered as an additional effect. Any contamination deemed by risk assessment to have posed a significant risk during construction would have been removed or remediated during the construction phase.

[32] Best and Most Versatile land is agricultural land considered to be the most flexible, productive and efficient and is most capable of delivering crops for food and non-food uses.

[33] Made ground is land where natural soils have been replaced by man-made materials, for example embankments.

3.7 Material assets and waste

Introduction

3.7.1 A material assets and waste assessment has been undertaken, considering the likely significant environmental effects from: the use and consumption of construction materials; building over or close to mineral safeguarding sites and peat resources; and the production and disposal of waste during the construction and operation of the Scheme.

Baseline environment

3.7.2 Regional baseline data shows that there is likely to be a good supply of both primary (new materials rather than recycled) and recycled aggregates (minerals which are used for construction including sand, gravel and crushed rock) within the north-west of England to support the construction of the Scheme. These data also show that there is likely to be sufficient available waste management and disposal capacity within the north-west region to accommodate the majority of waste likely to arise during the construction of the Scheme.

3.7.3 Mineral safeguarding maps show that a proportion of the Scheme is located within Mineral Safeguarding Areas for sand and gravel and brick clay/surface coal, and Areas of Search for sand and gravel. Mineral planning authorities designate these areas to protect known locations of minerals from non-minerals surface development which may prevent the existing and potential future extraction and use of the minerals – this is known as sterilisation.

3.7.4 The results of ground investigations and soil surveys indicate that there are limited existing peat deposits within the Scheme extents. At most locations, only isolated pockets of thin peat layers and remnant buried peat has been identified, with those peaty deposits encountered tending to be clustered in the north-west of the Scheme where there would be fewer permanent works. However, these peaty deposits are not considered to be peat resources (existing or potential peat extraction sites) for the purposes of this assessment.

Effects during construction

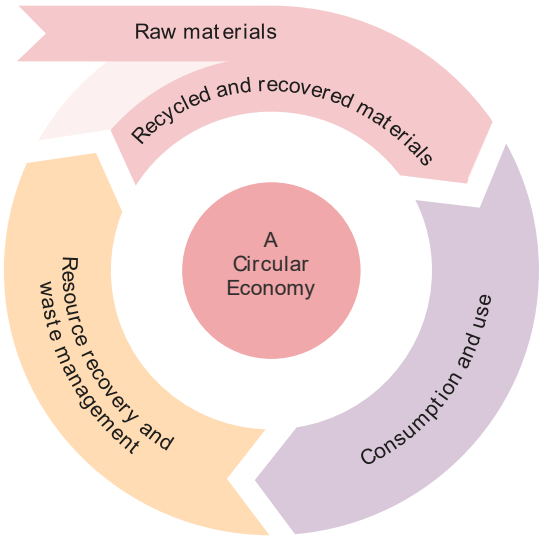
3.7.5 Construction of the Scheme would need materials and would generate waste that would need to be managed. The use of primary (or virgin) materials leads to direct impacts on the environment through use of limited natural resources. Disposal of waste to landfill leads to direct impacts on the environment through the permanent use of landfill space and the loss of material that could potentially be recycled.

3.7.6 To construct the Scheme land would be required permanently for new highways, access roads, structures, embankments, drainage, ponds and land for environmental mitigation. This would include land take from inside Mineral Safeguarding Areas and Areas of Search. Whilst this could partially constrain or prevent the potential future extraction of the minerals in these areas, discussions with the Greater Manchester Minerals and Waste Planning Unit and the Coal Authority confirm the Scheme is unlikely to lead to the significant sterilisation of the mineral resource in the study area.

3.7.7 While peaty deposits are also recorded within the Scheme boundary, these are not considered to be peat resources and discussions with the Greater Manchester Minerals and Waste Planning Unit has confirmed that no significant sterilisation of peat resources is therefore likely to occur. This is on the basis that national planning policy requires that planning authorities do not identify new sites or extensions to existing sites for commercial peat extraction. This is due to peat being an important "carbon sink" owing to its properties of absorbing / locking away carbon dioxide (a heat-trapping greenhouse gas) in the ground. Due to its compressible nature however, any localised peaty deposits that are encountered within the footprint of certain permanent works may need to be excavated and managed as waste if they cannot be built over using standard construction methods.

3.7.8 Good practice mitigation measures would be implemented throughout the design and construction of the Scheme to reduce: the use and consumption of primary construction materials, unnecessary sterilisation of safeguarded mineral resources, and the production and disposal of waste to landfill in the north-west region. Where feasible, any surplus materials and wastes would be reused, recycled or otherwise recovered on or off-site. Maximising the reuse of materials and diverting waste away from landfill would reduce the environmental impacts associated with materials extraction or production, thereby supporting a circular economy[34] (see Plate 3.5).

Plate 3.5 A circular economy[35]



[34] A circular economy is an alternative to a traditional linear economy (of make, use, dispose) in which resources are kept in use for as long as possible.

[35] Illustration from Department for Environment, Food and Rural Affairs (2018). Resources and waste strategy: at a glance. https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england/resources-and-waste-strategy-at-a-glance.

3.7.9 By following good practice during construction, the Scheme has the potential to achieve up to 81% overall material recycling / recovery to substitute the use of primary materials, either on the Scheme or within the north-west region[36]; and use imported aggregates and aggregate containing materials with up to 67% recycled content[37].

3.7.10 Even with this good practice, the Scheme has the potential to dispose of about 23,200 tonnes of residual construction waste to landfill (i.e. after having first recovered and diverted 95% of this waste away from landfill). This would be equivalent to a small (less than 1%) reduction in landfill capacity for inert and non-hazardous waste in the north-west region.

3.7.11 The assessment has therefore concluded that that there would be **no significant effects** on material assets and waste from constructing the Scheme, after the application of mitigation.

Effects during operation

3.7.12 No significant maintenance activities would occur the first year of operational activities (opening year), and therefore no significant materials consumption or waste generation is expected. There would be **no significant effects** on material assets and waste during the operation of the Scheme.

3.8 Noise and vibration

Introduction

3.8.1 Noise and vibration can have an effect on the environment and on the quality of life enjoyed by individuals and communities. It may, in certain circumstances, lead to effects on human, ecological and infrastructure (e.g. buildings) receptors. An assessment of the construction and operation of the Scheme on noise and vibration has been undertaken.

Baseline environment

3.8.2 The study areas for the assessment correspond to the distance where it is considered that sensitive features could potentially be affected by noise or vibration. The study areas are:

- Construction noise – receptors up to 300 metres from construction activity.
- Construction vibration – receptors up to 100 metres from any activity likely to generate a noticeable level of vibration.
- Operational road traffic noise – receptors up to 600 metres from new road links or roads physically changed or bypassed by the Scheme.

[36] This has been determined by calculating the quantities of: site-won materials; imported materials with recycled content; and off-site recovered waste as a proportion of total materials input / output on the Scheme.

[37] Excludes site-won earthworks and recycled demolition materials which are not considered an imported aggregate for the purposes of the Design Manual for Roads and Bridges assessment criteria.

3.8.3 Noise measurement surveys have been undertaken in Autumn and Winter 2021 to understand the existing noise levels better (see Plate 3.6 for an example of the noise monitoring equipment used for the surveys).

Plate 3.6 Typical noise monitoring equipment

3.8.4 The existing noise climate near the Scheme is dominated by road traffic noise, predominantly from the M60, M62 and M66, as well as traffic using local roads. There are six Noise Important Areas within 600 metres of the Scheme. Four of the Noise Important Areas are directly within or adjacent to the Scheme, and the remaining two are located adjacent to the local road network.

3.8.5 Along the route of the Scheme there are many features that are sensitive to noise and vibration. The wider area around the Scheme is mostly urban, with the exception of the area to the north-east of M60 J18, which is open space. There are large areas of noise sensitive receptors, mainly residential dwellings, in the settlements of Simister, Prestwich and Besses O'Th'Barn, and some isolated semi-rural dwellings. The settlement areas also contain other noise sensitive receptors within the study area, including education facilities and healthcare facilities.

Effects during construction

3.8.6 Construction activities can cause adverse noise effects due to the overall noise level and the timing and duration of works. The activities likely to generate the highest overall levels of noise include piling (foundations that are driven into the ground) and pavement works, while longer-term activities, such as the construction of a new bridge, can cause adverse effects due to the duration of the works. Works, including most of the online works, need to be carried out during off-peak working hours such as nights, evenings and weekends.

3.8.7 Well established measures would be used during the construction phase to reduce the noise from construction activities. These would include using well-maintained equipment, building elements of the construction away from the site, and using temporary noise barriers for the noisiest activities. Good community relations are also key to managing the adverse effects of noise. Nearby residents would be informed of forthcoming works, especially works at night, through a range of measures including for example, newsletters, emails, text alerts and, in some situations, visits from the community relations team.

3.8.8 There would be **significant adverse effects** on nearby noise sensitive receptors during some phases of construction work, including site clearance and de-vegetation, earthworks, gantry installation, landscaping, road surfacing (pavement works) and white lining. Exceedances of construction threshold levels during both daytime and night-time works would result in significant adverse effects. The assessment has shown that 275 noise sensitive receptors would be significantly affected during daytime construction works (at various locations in the areas to the north and south of the M60 between J17 and J18, Simister Village and Cowl Gate Farm, depending on the phase of works), and 647 noise sensitive receptors would be significantly affected during night-time construction works (at various locations in the areas to the north and south of the M60 between J17 and J18, Simister Village and Cowl Gate Farm, depending on the phase of works).

3.8.9 There would be **no significant adverse effects** from vibration during construction activities.

Effects during operation

3.8.10 When the roads open for traffic (called Scheme opening) there are predicted to be road traffic noise decreases due to implementation of mitigation strategies. A minor noise increase of over one decibel is indicated on the public right of way adjacent to the M66 southbound where it is adjacent to the road, and decreasing as the right of way moves away from the area. Negligible noise increases of less than one decibel are predicted for numerous receptors including in the areas of M60 J17 along Bury New Road and Bury Old Road, M60 J18 in Simister, and M60 and M66 south and north of the M60 J18.

3.8.11 There are moderate noise decreases of three to below five decibels predicted for 1,549 residential dwellings and seven other sensitive receptors. This is due to the use of a low noise road surface with better noise reducing properties than a conventional low noise surface, resulting in a **short-term significant beneficial effect**.

3.8.12 Major noise decreases of over five decibels are predicted for 36 properties located north and south of the M60 between J17 and J18 around Barnard Avenue and Warwick Avenue. These dwellings would experience a **short-term significant beneficial effect**.

3.8.13 The introduction of the new road sections that make up the Northern Loop do not result in increased overall road traffic noise for the closest receptors on Marston Close and Cowl Gate Farm on Pole Lane.

3.8.14 15 years after opening, the significant beneficial effects experienced by receptors would gradually decrease as traffic increases over the time period. The short-term benefits experienced by these receptors would **not be considered overall operational significant beneficial effects**.

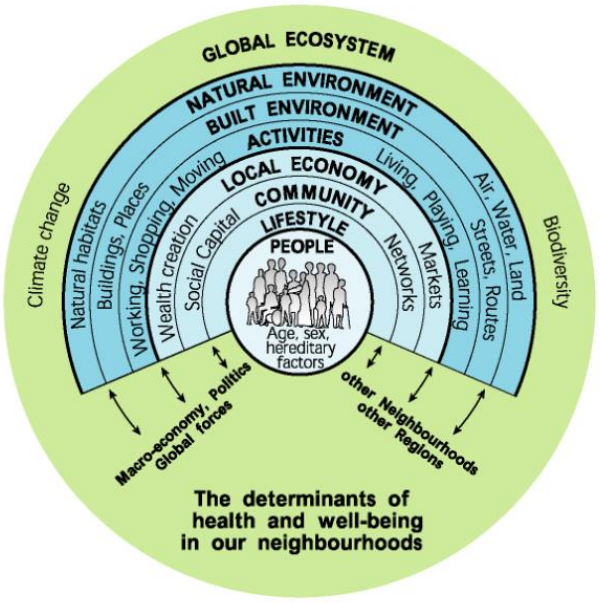
3.8.15 The assessment has shown that there would be **no significant effects** during operation.

3.9 Population and human health

Introduction

3.9.1 A population and human health has been undertaken, considering land use and accessibility, and health in terms of physical, mental and social well-being. Health is determined by a complex interaction between individual characteristics, lifestyle and the physical, social and economic environment. Most public health experts agree that these 'wider determinants of health' have a greater influence than formal healthcare for ensuring a healthy population (see Plate 3.7).

Plate 3.7 Wider determinants of health in our built and natural environment[38]



Baseline environment

3.9.2 The study area for land use and accessibility includes the Order Limits together with a buffer of approximately 100 metres, and the study area for human health consists of the wards that coincide with the Order Limits.

[38] Illustration from Barton, H. and Grant, M. (2006) A health map for the local human habitat.

3.9.3 Key settlements within the study area include Whitefield, Prestwich, Unsworth and Simister. These areas contain numerous community facilities and businesses of all types. Outdoor recreational assets nearest to the Scheme include Whitefield Golf Course, Philips Park/Prestwich Forest Park and Pike Fold Golf Club. Residential dwellings border the M60 between J17 and 18 and the east of the M66 north of M60 J18. There are areas of arable land (land capable of being ploughed and used to grow crops) and grazing agricultural land located adjacent east of M60 J18 and west of the M66.

3.9.4 There is a Public Rights of Way network within the study area. There are also Transport for Greater Manchester cycle routes within the Order Limits, as well as footways, lanes and permissive routes used by walkers, cyclists and horse-riders. There are a total of eight routes that can be used by walkers, cyclists and in some cases horse riders to cross the M60, M66 and M62 within the Order Limits, of which two are Public Rights of Way, one is the permissive path through Haweswater Aqueduct underpass and the others are local roads. Further routes including Public Rights of Way are located within the Order Limits where there are elements of the Scheme such as haul routes, compounds and soil storage areas, ponds and the Northern Loop.

3.9.5 Large areas of land bordering the M60 J18 have been allocated for housing or mixed-use development in the Greater Manchester Combined Authority's Joint Development Plan Document 'Places for Everyone' (submitted August 2021).

3.9.6 The wards of Higher Blackley, Besses and St Mary's score significantly worse than average for several health indicators and for levels of income deprivation and have a higher-than-average rate of premature deaths. This indicates that these communities may, on average, be more sensitive to pollution and problems of traffic than other communities and have less capacity to adapt to change. There may also be a greater dependency on public transport, taxis, walking and cycling among people in income-deprived communities to access services and employment.

3.9.7 Areas of key concern with regard to baseline noise and air pollutant levels are described in the Noise and vibration and Air quality sections of this Non-Technical Summary, respectively.

Effects during construction

3.9.8 There would be **moderate (significant) adverse effects** on one agricultural landholding due to permanent land take, and on three agricultural landholding due to temporary and permanent land take for the construction of the Scheme.

3.9.9 There would also be a temporary **very large (significant) adverse effect** on users of the permissive path via Haweswater Aqueduct underpass, and a **moderate (significant) adverse effect** on users of footpath 84BUR (west of the M66) due to temporary closure and diversion of these routes during construction. There would also be a temporary **moderate (significant) negative effect** on users of footpath 9WHI which would be closed for at least three years during construction until a replacement route has been provided.

3.9.10 Effects on other matters of land use and accessibility (private property and housing; community land and assets; and development land and business) would be **not significant**, subject to mitigation measures such as engagement with landowners or developers and full reinstatement of land acquired on a temporary basis.

3.9.11 There would be a temporary **moderate (significant) negative effect** for residents of Besses ward during construction, due to impacts on access to the natural environment and outdoor recreation from temporary diversion of footpaths, reductions in recreational amenity of some footpaths from disruption by construction traffic, and loss of greenspace as a result of vegetation clearance and temporary and permanent land take from agricultural landholdings.

3.9.12 There would also a temporary **large (significant) negative effect** on quality of life in all wards within the study area due to construction-related noise.

3.9.13 The combination of construction noise, localised dust, lighting and changes to accessibility and severance during construction is likely to lead to annoyance among residents of the communities most affected by construction works, which is assessed as a temporary **moderate (significant) negative effect** for the mental wellbeing of residents in Besses, Unsworth and Holyrood wards.

3.9.14 Mitigation measures would be employed during construction. These would include appointing a Community Liaison Manager to address local concerns during the construction phase. This would help with protective factors for mental health such as giving communities enhanced control and facilitating participation.

Effects during operation

3.9.15 There would be **no significant adverse effects** on land use and accessibility during operation, as the main impacts of land take and changes to access would occur during construction. No further impacts on agricultural landholdings are predicted over and above the permanent effect on one agricultural landholding predicted for construction.

3.9.16 There would be a permanent **large (significant) positive effect** on health outcomes (morbidity and mortality[39]) in all wards within the study area due to overall reductions in long-term exposure to traffic noise, which is associated with health benefits at a population level. There would be **no significant effects** on other determinants of health during operation.

[39] A morbidity rate tracks data on illness and disease within a population, while a mortality rate tracks the number of deaths from illness or disease within a population.

3.10 Road drainage and the water environment

Introduction

3.10.1 The road drainage and the water environment assessment considers impacts on surface water (water quality and hydromorphology[40]), groundwater, drainage, and flood risk. The assessment also considers the Scheme's compliance with the Water Framework Directive[41].

3.10.2 Desk-based assessments, hydromorphology surveys, drainage surveys, aquatic surveys and ground investigation have been undertaken to better understand the existing water environment.

Baseline environment

3.10.3 The study area for the assessments varies depending upon water environment features and the potential extent of impacts. The study areas are 250 metres for groundwater dependent terrestrial ecosystems, 1 kilometre for hydromorphology, surface water and flood risk, and 2 kilometres for groundwater.

3.10.4 The Scheme crosses one watercourse, Parr Brook, which passes under the M60 west of J18 in a culvert. Parr Brook receives road runoff from the Scheme as well as the River Irk, River Irwell, and Castle Brook.

3.10.5 The Scheme and all watercourses within the study area lie within the River Irwell catchment, a tributary[42] to the River Mersey. There are five main rivers within the study area, comprising Brightly Brook, Castle Brook, Hollins Brook, Parr Brook, and Whittle Brook.

3.10.6 There are aquifers[43] within the study area that support local water supplies, and six licensed groundwater abstractions used for industrial/commercial purposes[44]. The majority of the Scheme lies on aquifers classified as having a medium-high or medium vulnerability to contamination. There are also nine locally designated ecological sites within 250 metres from the Order Limits with habitats that are potentially dependent on groundwater.

3.10.7 There is one (revoked) potentially contaminated land site located in the south-east of the groundwater study area, and two historic landfill sites situated adjacent to the M60 between J18 and J19 (see Section 3.6 for further information).

[40] Hydromorphology is the physical character and form of rivers.

[41] The Water Framework Directive is a legal framework for improving the quality of water bodies.

[42] A tributary is a stream or river that flows into a larger stream or river.

[43] Aquifers are bodies of rock or sediment that hold water.

[44] Groundwater abstraction is the process of taking water from a groundwater source.

3.10.8 The Environment Agency has designated Flood Zones 1, 2 and 3 to indicate how likely an area is to flood. The Scheme is located within an area designated as Flood Zone 1[45]. There are numerous areas of surface water flood risk within the study area, and there are two main areas within the Order Limits with potential for groundwater flooding to occur (either at surface level or to property or infrastructure situated below ground level).

Effects during construction

3.10.9 The design of the Scheme includes a number of mitigation measures to reduce the Scheme's effects on the water environment, including:

- Ponds to store and treat water that will run off the road surface before discharging into watercourses
- Designing outfalls to minimise impact to watercourses

3.10.10 Effects on flood risk, water quality, hydromorphology and groundwater during construction would be mitigated by following good construction practice, such as pollution prevention guidelines, and locating construction activities outside of areas at risk of flooding.

3.10.11 There would be **no significant adverse effects** on surface water and hydromorphology. The key likely impacts during construction of the Scheme for surface water and hydromorphology are from the mobilisation of sediment and the use of polluting substances. If released into the environment these can pollute surface waterbodies. However, application of mitigation measures and best practice methods would reduce these impacts to not significant.

3.10.12 There would be **large (significant) adverse effects** on three groundwater dependent terrestrial ecosystem sites (Cowl Gate Farm, Castle Brook South, and Egypt Lane South), due to changes to groundwater flows, levels and quality from ground disturbance. There would be partial or total habitat loss by soil stripping or vegetation clearance. The loss of these features is mitigated by the implementation of improved habitats (see Section 3.5 for further details).

3.10.13 The risk of flooding during construction is most likely to arise from heavy rainfall when runoff may potentially flood working areas and excavations. With mitigation measures such as temporary drainage, there would be **no significant adverse effects** from construction activities on sources of flood risk.

[45] Flood Zones indicate how likely an area is to flood. Flood Zone 1 indicates low risk of flooding from rivers, with less than 0.1% chance of flooding in any one year.

Effects during operation

3.10.14 The Scheme includes sustainable drainage systems such as ponds and swales to store and treat water that would run off from the road surface before being released into watercourses for most outfalls. Some discharges of run-off via drainage outfalls could have impacts on water quality in the short-term for the watercourses they go into, however there would be **no significant adverse effects** on surface water and hydromorphology. The inclusion of features which would provide water quality treatment where currently there are none would lead to slight beneficial effect for two outfalls.

3.10.15 There would be **moderate (significant) adverse effects** for three groundwater dependent terrestrial ecosystem sites (Cowl Gate Farm, Castle Brook South, and Egypt Lane South) due to long-term disturbance of groundwater levels and flows from the presence of permanent underground infrastructure.

3.10.16 The drainage system has been designed to minimise the risk of flooding or causing flooding elsewhere by incorporating current design standards and future climate change allowances to improve its resilience, and through the use of measures to control and manage runoff, there would be **no significant adverse effects** on flood risk during operation.

3.11 Climate

Introduction

3.11.1 Major road schemes can lead to an increase in greenhouse gas emissions resulting from changes in road traffic emissions and the use of materials and energy to construct, operate and maintain infrastructure. Changes in land use and forestry can also result in changes in greenhouse gas emissions.

3.11.2 The climate assessment considers the potential impact of the Scheme on climate by estimating resulting changes in greenhouse gas emissions. This includes ‘embodied’ carbon within the materials used, carbon used in transport during construction and operation, and changes in land use affecting the storage of carbon.

3.11.3 The climate assessment also considers the potential vulnerability of the Scheme to possible future changes in climate (such as changes in temperature and rainfall patterns). Features that are potentially vulnerable to climate change include the Scheme itself (e.g. pavements, structures, earthworks, drainage and technology) but also operational road users, including the public and commercial operators, who may be affected by disruption.

Baseline environment

3.11.4 The study area for greenhouse gas emissions resulting from construction considers emissions associated with the manufacture and transport of construction materials, on site construction activities, worker commutes, and the transport and treatment of waste offsite for reuse, recycling, treatment, or disposal. Changes in road traffic emissions during the construction phase have also been considered (e.g. as a result of traffic management) as well as greenhouse gas emissions associated with the disturbance of soil and removal of vegetation. The study area is defined by the greatest extent of these activities, some which may occur at a national scale.

3.11.5 The study area defined for greenhouse gas emissions resulting from operational maintenance activities is based on a similar area to the study area defined during the construction phase. Greenhouse gas emissions associated with the consumption of electricity during the operation of the Scheme have also been considered. Changes in road traffic conditions as a result of the operation of the Scheme have been considered over an area greater than the road network affected by the works to provide a more complete assessment of changes in road user greenhouse gas emissions.

Effects during construction

3.11.6 The total greenhouse gas emissions from the construction phase are estimated to be 62,013 tonnes of carbon dioxide equivalent. The largest proportion of greenhouse gas emissions from the construction phase (43.9% in total) is associated with the construction process stage, which includes the transport of materials to the site, the transport and treatment of waste, employee transport, and construction and installation processes. Greenhouse gas emissions associated with the production of materials are estimated to contribute 39.3%, and changes in land use, peaty soil excavation and forestry during the construction phase are estimated to contribute 16.8%. The total greenhouse gas emissions from road users during the construction period are estimated to decrease slightly as a result of rerouting away from the construction works and enforced speed limits near the Scheme.

3.11.7 Construction phase greenhouse gas emissions, particularly following the implementation of mitigation measures to avoid or reduce greenhouse gas emissions, are estimated to be negligible in comparison to relevant United Kingdom carbon budgets[46] (0.002% and 0.001% of the fourth and fifth carbon budgets, respectively). Construction phase greenhouse gas emissions are therefore considered unlikely to have a material impact on the ability of the United Kingdom Government to meet its carbon reduction targets and are therefore **not significant**.

[46] Each carbon budget provides a five-year, statutory cap on total United Kingdom greenhouse gas emissions. This cap should not be exceeded if the United Kingdom is to achieve its commitments to reduce emissions.

3.11.8 Climate change related impacts are considered **not significant** during the construction phase following the application of mitigation measures to reduce the vulnerability of the Scheme to impacts from climate change. These would include, for example, suitable management of site drainage and using weather forecasts to plan on-site activities to minimise the impacts of heavy rainfall.

Effects during operation

3.11.9 Operational phase greenhouse gas emissions would mainly be from vehicles using the infrastructure. Within the study area for the climate assessment the Scheme is estimated to result in an increase in emissions of 0.9% in the Scheme opening year (2029), an increase in emissions of 0.6% 15 years after Scheme opening (2044), and an increase in emissions of 0.6% in the 'future year' (2061). Changes in land use and forestry as a result of the Scheme are estimated to result in a slight increase in carbon sequestration[47] (i.e. a net benefit) during its operation.

3.11.10 Operational phase greenhouse gas emissions are estimated to be negligible in comparison to relevant United Kingdom carbon budgets (0.001% and 0.002% of the fifth and sixth carbon budgets, respectively). Operational phase greenhouse gas emissions are therefore considered unlikely to have a material impact on the ability of the United Kingdom Government to meet its carbon reduction targets and are therefore **not significant**.

3.11.11 For the operational phase, a number of potential climate hazards have been identified at this stage for a minimum 60-year design life, including various hazards related to increased rainfall and extreme rainfall events in winter, various hazards associated with decreased rainfall and higher occurrence of dry spells, and increased summer temperatures and heatwaves/hot spells.

3.11.12 Materials would be chosen that comply with relevant highways design standards, guidance and good engineering practice. Additionally, the design incorporates suitable climate change allowances in accordance with relevant Environment Agency guidance. These mitigation measures, coupled with appropriate asset management during operation including monitoring and inspections, would adequately address the potential climate change hazards identified. As a result, it is considered that there would be **no significant effects** in relation to the potential climate-related hazards identified.

3.12 Cumulative effects assessment

Combined effects

3.12.1 Combined effects can arise from interrelationships between environmental aspects (for example between ecology and the water environment, population and human health), affecting a single resource or receptor. Combined effects have been assessed within the individual environmental aspect chapters of the Environmental Statement.

[47] Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide.

Inter-project cumulative effects

3.12.2 Although an individual development may not itself have significant environmental effects, when combined with other development(s), impacts could potentially combine to result in a significant cumulative effect on a receptor or group of receptors. These are known as inter-project cumulative effects.

3.12.3 A review of planning applications made to local planning authorities, as well as other National Significant Infrastructure Projects and Transport Works Act Orders developments within the study area for the cumulative effects assessment (2 kilometres from the Order Limits) was undertaken to identify any other developments which have the potential to result in cumulative effects together with the Scheme.

3.12.4 A total of 110 records of planning applications, development plan allocations and other reasonably foreseeable developments were identified in a ‘long list of other developments’. After initial screening, 21 other developments were carried forward to a ‘short list of other developments’. Following further screening using threshold criteria, two other developments were progressed for further assessment. The assessment concluded that there would be **no significant effects** resulting from the Scheme in combination with these other developments.

4 Summary

4.1.1 Table 4.1 provides a summary of the likely significant residual effects associated with the construction and operation of the Scheme. Mitigation measures have been developed for this assessment to avoid or reduce environmental effects where possible, and these measures have been considered when determining the significance of effects.

Table 4.1 Summary of likely significant residual effects

Aspect	Construction	Operation*
Air quality	No likely significant effects identified.	No likely significant effects identified.
Cultural heritage	No likely significant effects identified.	No likely significant effects identified.
Landscape and visual	Likely significant adverse effects Landscape Character Area 26: Prettywood, Pilsworth and Unsworth Moss due to construction activities (for example, from the movement of construction machinery; the presence of site compounds, haul roads and material stockpiles; and loss of vegetation). Likely significant adverse effects on people's views at 17 representative viewpoint locations due to construction activities including those noted above.	During the opening year there would be significant adverse effects on people's views at 16 representative viewpoint locations due to vegetation loss and resulting views of new and existing highways infrastructure (such as the Northern Loop and new gantries and signage, and from clearance of linear tree belts along the M60 mainline). These effects would reduce to non-significant 15 years after Scheme opening (2044) due to the establishment of mitigation planting, except at one representative viewpoint location, where significant adverse effects would remain.
Biodiversity	No likely significant effects identified.	No likely significant effects identified.
Geology and soils	Likely significant adverse effects on soils of moderate to very good quality (including Best and Most Versatile land) due to permanent and temporary land take requirements.	No likely significant effects identified*.
Material assets and waste	No likely significant effects identified.	No likely significant effects identified.
Noise and vibration	Likely significant adverse effects on 275 noise sensitive receptors during daytime construction works at various locations in the areas to the north and south of the M60 between J17 and J18, Simister Village and Cowl Gate Farm, depending on the phase of works. Likely significant adverse effects on 647 noise sensitive receptors during	There would be short term significant beneficial effects on a large number of noise sensitive receptors at Scheme opening, however these benefits would gradually decrease to not significant long-term. No likely significant effects identified.

Aspect	Construction	Operation*
	night-time construction works at various locations in the areas to the north and south of the M60 between J17 and J18, Simister Village and Cowl Gate Farm, depending on the phase of works.	
Population and human health	Likely significant adverse effects on four agricultural land holdings due to permanent and/or temporary land take, and on three routes used by walkers or walkers and cyclists due to temporary diversion of these routes. Likely negative significant effect on access to the natural environment and outdoor recreation for residents in Besses ward, and negative significant effects on quality of life from construction noise for some residents in all wards in the human health study area.	No likely significant adverse effects identified*. Permanent positive significant effect on health outcomes in all wards within the study area, due to overall reductions in long-term exposure to traffic noise.
Road drainage and the water environment	Likely significant adverse effect on three groundwater dependent terrestrial ecosystem sites** (Cowl Gate Farm, Castle Brook South, and Egypt Lane South) due to changes to groundwater flows, levels and quality from ground disturbance. There would be partial or total habitat loss from soil stripping or vegetation clearance.	Likely significant adverse effect on three groundwater dependent terrestrial ecosystem sites** (Cowl Gate Farm, Castle Brook South, and Egypt Lane South) due to long-term disturbance of groundwater levels and flows from the presence of permanent underground infrastructure.
Climate	No likely significant effects identified.	No likely significant effects identified.
Cumulative effects	No likely significant effects identified.	No likely significant effects identified.

*The permanent loss of agricultural land occurring during construction would persist during operation but is not considered as an additional effect.

**Effects on the habitats supported by groundwater dependent terrestrial ecosystem sites are considered in the biodiversity assessment. Due to the type and importance of the habitats supported by these three sites, the biodiversity assessment has concluded that these effects would not be ecologically significant.

5 What happens next?

5.1.1 The Planning Inspectorate, on behalf of the Secretary of State, will manage the planning process once the Development Consent Order application has been submitted.

5.1.2 Members of the public can register with the Planning Inspectorate as Interested Parties which will entitle them to make written representations and participate in the examination process. Information on how to register can be found on the National Infrastructure Planning webpage for the Scheme: https://infrastructure.planninginspectorate.gov.uk/projects/north-west/m60-m62-m66-simister-island/.

5.1.3 The Planning Inspectorate will appoint an Examining Authority to undertake the examination of the Development Consent Order application. Through the course of the examination, careful consideration is given by the Examining Authority to all the important and relevant matters. This includes the representations made by Interested Parties, any supporting evidence submitted and answers provided to the Examining Authority's questions in writing or at hearings.

5.1.4 The examination is expected to last up to six months.

5.1.5 The Examining Authority then has three months to prepare its report recommendation on the application. This is then passed to the Secretary of State for Transport, who will have three months to decide whether or not to grant the Development Consent Order.

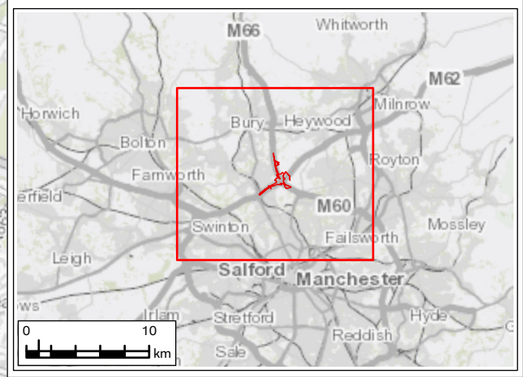
5.1.6 Granting the Development Consent Order would give the Applicant the necessary legal powers to proceed with the Scheme.

FIGURE 1

Legend

- Order Limits
- Local Planning Authority Boundaries

The Order Limits are the limits of land to be acquired or used permanently or temporarily within which the Scheme may be carried out.



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	JAN 24	For DCO application	LT	MS	JR	BB

Development Consent Order Number:	Development Consent Order Drawing Number:
TR010064	6.4

Client

national highways

Project

REGIONAL DELIVERY PARTNERSHIP
M60/M62/M66 SIMISTER ISLAND INTERCHANGE

Drawing Title

ENVIRONMENTAL STATEMENT
LOCATION PLAN

Drawing Status

S4 – SUITABLE FOR STAGED APPROVAL

Scale @ A3	1:50,000	DO NOT SCALE
Jacobs No.	B36601F0	
Client No.	HE548642	Rev P01

Drawing Number

HE548642-JAC-LDC-SII_MLT-SK-LE-0077

0 4 Km

FIGURE 2

Hollins Vale LNR
Brick Farmhouse
Hollins Plantation SBI
Unsworth War Memorial
Cold Gate Farm
Haweswater Aqueduct underpass permissive path
Philips Park and North Wood SBI
Heaton Park Reservoir (West) SBI
Heaton Park Reservoir (East) SBI
Droughts Farm
Church Of St George
Hazlitt Wood SBI

INSET MAP

Rochdale Canal SAC/SSSI

Legend

- Order Limits
- 2km Buffer
- Affected Road Network (ARN)
- ARN 200m Buffer
- Grade I Listed Building
- Grade II Listed Building
- Grade II* Listed Building
- Non-designated Historic Buildings (Point)
- Non-designated Historic Buildings (Region)
- Watercourse - Open Channel
- Culvert
- National Cycle Network Route 6
- Public Rights of Way (PRoW)
- Permissive Path
- Conservation Area
- Sites of Biological Importance (SBI)
- Special Landscape Areas Bury UDP Policy EN9/1
- Rochdale Canal Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI)
- Heaton Park Registered Parks and Garden
- Scheduled Monuments
- Local Nature Reserves (LNR)
- Ancient Woodland
- Noise Important Areas
- Green Belt
- Greater Manchester Air Quality Management Area (AQMA)

INSERT MAP

MAIN MAP

P01	JAN 24	For DCO application	LT	MS	JR	BB
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Development Consent Order Number: TR010064

Development Consent Order Drawing Number: 6.4

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
M60/M62/M66 SIMISTER ISLAND INTERCHANGE

Drawing Title: ENVIRONMENTAL STATEMENT
KEY ENVIRONMENTAL CONSTRAINTS

Drawing Status: S4 – SUITABLE FOR STAGED APPROVAL

Scale @ A3	1:30,000	DO NOT SCALE
Jacobs No.	B36601F0	
Client No.	HE548642	Rev P01

Drawing Number: HE548642-JAC-LDC-SII_MLT-SK-LE-0079

FIGURE 3

Legend

- Order Limits
- Scheme design
- Ponds and swales

Gantries

- New Gantries
- Removed Gantries
- Retained Gantries

Public right of way and maintenance access track

- Maintenance access track
- Public right of way
- Retained public right of way
- Stopped up public right of way

New gantries on the M66 southbound side

Realignment of the M66 southbound slip road to J18

Pond 2

Widening of the M66 southbound through J18 from two lanes to four lanes

Pond 1

New loop road (the 'Northern Loop') to provide a new link between the M60 eastbound to the M60 southbound

Simister Pike Fold Bridge

Simister Pike Fold Viaduct

Renewal of signs and signals, including new signs and street lighting at M60 J18 and its approaches, and renewed traffic signals at the M60 J18 roundabout

Pond 7

Realignment of the approach to the M60 eastbound to M66 northbound link road

Realignment of the M62 westbound to M60 southbound link

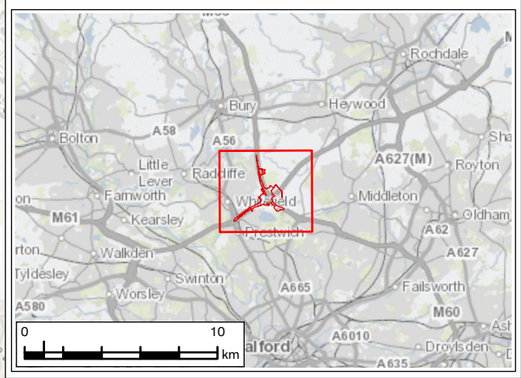
New gantries between Junctions 17 and 18 of the M60

Pond 4

Pond 5

Widening of M60 J17 to J18 from four to five lanes in both directions with new hard shoulder

Widening of the M60 northbound to M60 westbound link from one to two lanes



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	JAN 24	For DCO application	LT	MS	JR	BB

Development Consent Order Number: TR010064

Development Consent Order Drawing Number: 6.4

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
M60/M62/M66 SIMISTER ISLAND INTERCHANGE

Drawing Title: ENVIRONMENTAL STATEMENT
OVERVIEW OF THE SCHEME DESIGN

Drawing Status: S4 – SUITABLE FOR STAGED APPROVAL

Scale @ A3	1:15,000	DO NOT SCALE
Jacobs No.	B36601F0	
Client No.	HE548642	Rev P01

Drawing Number: HE548642-JAC-LDC-SII_MLT-SK-LE-0078