

M60/M62/M66 Simister Island Interchange

**Preliminary Environmental Information Report
Non-Technical Summary**

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Non-Technical Summary

The Preliminary Environmental Information Report Non-Technical Summary (PEIR NTS) has been produced in PDF and digital formats. This document is the PDF format.

The digital PEIR NTS presents the same project information in digital format. The digital PEIR NTS can be accessed via the following link:

<https://experience.arcgis.com/experience/c333028719d14c62a2ae247c3401420c/page/Homepage/>

The digital PEIR NTS can be viewed through internet web browsers on desktop computers, laptops, tablets and mobile phones. It is recommended that recent versions of the Google Chrome, Mozilla Firefox, Apple Safari or Microsoft Edge web browsers are used to view the digital PEIR NTS.

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1. Introduction

1.1 Scheme overview

- 1.1.1 National Highways on behalf of the Department for Transport is proposing to deliver improvements to the M60/M62/M66 Simister Island Interchange and the M60 between junctions 17 and 18 (known as the ‘scheme’) (see **Location plan**). The scheme involves widening of the motorway between junctions 17 to 18 of the M60 from four to five lanes and installing a discontinuous hard shoulder. The scheme also involves alterations of the M66 to provide four lanes southbound through M60 junction 18, 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 junction 18 (further detail is given in **Section 2.4**).
- 1.1.2 The scheme is located within the administrative area of Bury Metropolitan Borough Council but also extends into the Rochdale Borough Council, Manchester City Council and Salford City Council administrative areas for some of the study areas used for the preliminary environmental assessment (further detail is given in **Chapter 4**).

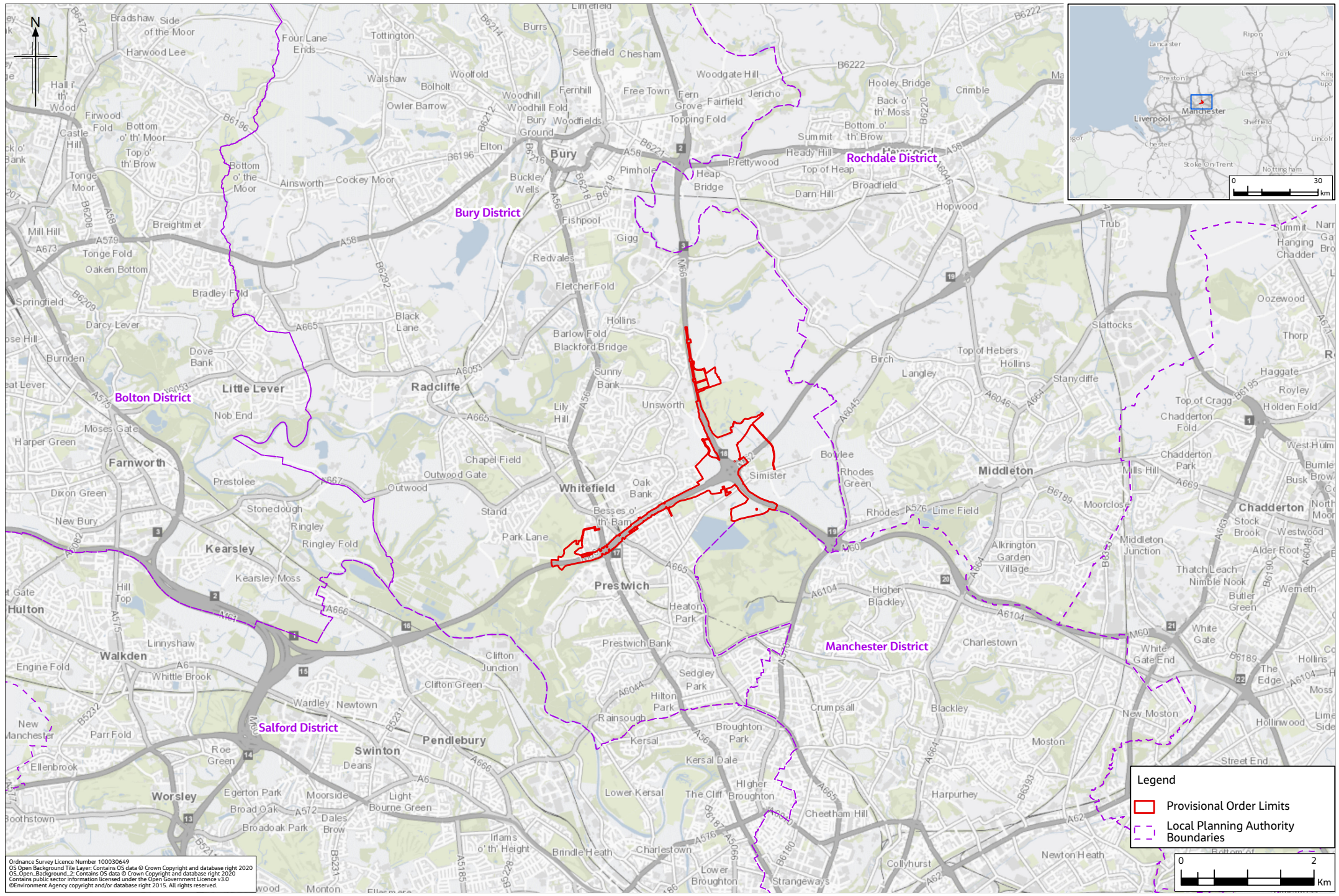
1.2 Development Consent Order

- 1.2.1 The scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008, triggering the need to apply for a Development Consent Order (DCO) in order to construct the scheme.
- 1.2.2 The scheme is currently in the pre-application stage of the DCO process. This involves developing the design and carrying out all necessary assessment and consultation before submitting the application for development consent. We are intending to submit the application for development consent in 2023.
- 1.2.3 The scheme could result in significant environmental effects, so an Environmental Impact Assessment is needed. The results of the Environmental Impact Assessment will be documented in an Environmental Statement, which we will submit as part of the application for development consent.

1.3 Preliminary Environmental Information Report

- 1.3.1 The Preliminary Environmental Information Report (PEIR) for the scheme has been produced to support the statutory consultation. The PEIR includes environmental information to allow consultees to understand the likely significant environmental effects of the scheme and measures proposed to avoid or reduce such effects (known as mitigation measures). The PEIR is provided to help members of the public, consultees and other stakeholders to develop an informed view of the scheme when submitting consultation responses.
- 1.3.2 This is the Non-Technical Summary of the PEIR, which presents the information in the PEIR in non-technical language.

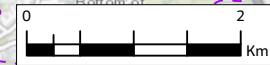
Location Plan



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Legend

- Provisional Order Limits
- Local Planning Authority Boundaries



2. The scheme

2.1 Need for the scheme

- 2.1.1 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 M60 junction 18 provides the interchange between the M60, M62, and M66 motorways to the north of Manchester. Several significant economic areas are accessed from M60 junction 18, including Manchester's city centre and central business district, Bury Town Centre, Heaton Park and the Pilsworth Road industrial estate.
- 2.1.3 M60 junction 18 is one of the busiest motorway junctions in the north-west, 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.

Traffic on the M60



- 2.1.4 Our proposed improvements to M60 junction 18 would:
- **Reduce traffic congestion and improve journey times** (up to three minutes during rush hour from M66 junction 3 and M60 junction 17) by increasing the capacity of the interchange and allowing traffic to flow more freely
 - **Reduce traffic on some local roads** as reduced delays on the motorway network makes travelling on the motorway a more attractive option for vehicle users
 - **Reduce the existing impact of the junction on the surrounding environment** including within Noise Important Areas and Air Quality Management Areas
 - **Ensure that the interchange can cope with a predicted increase in traffic** from more jobs and homes in Greater Manchester

2.2 Environmental input to the design process

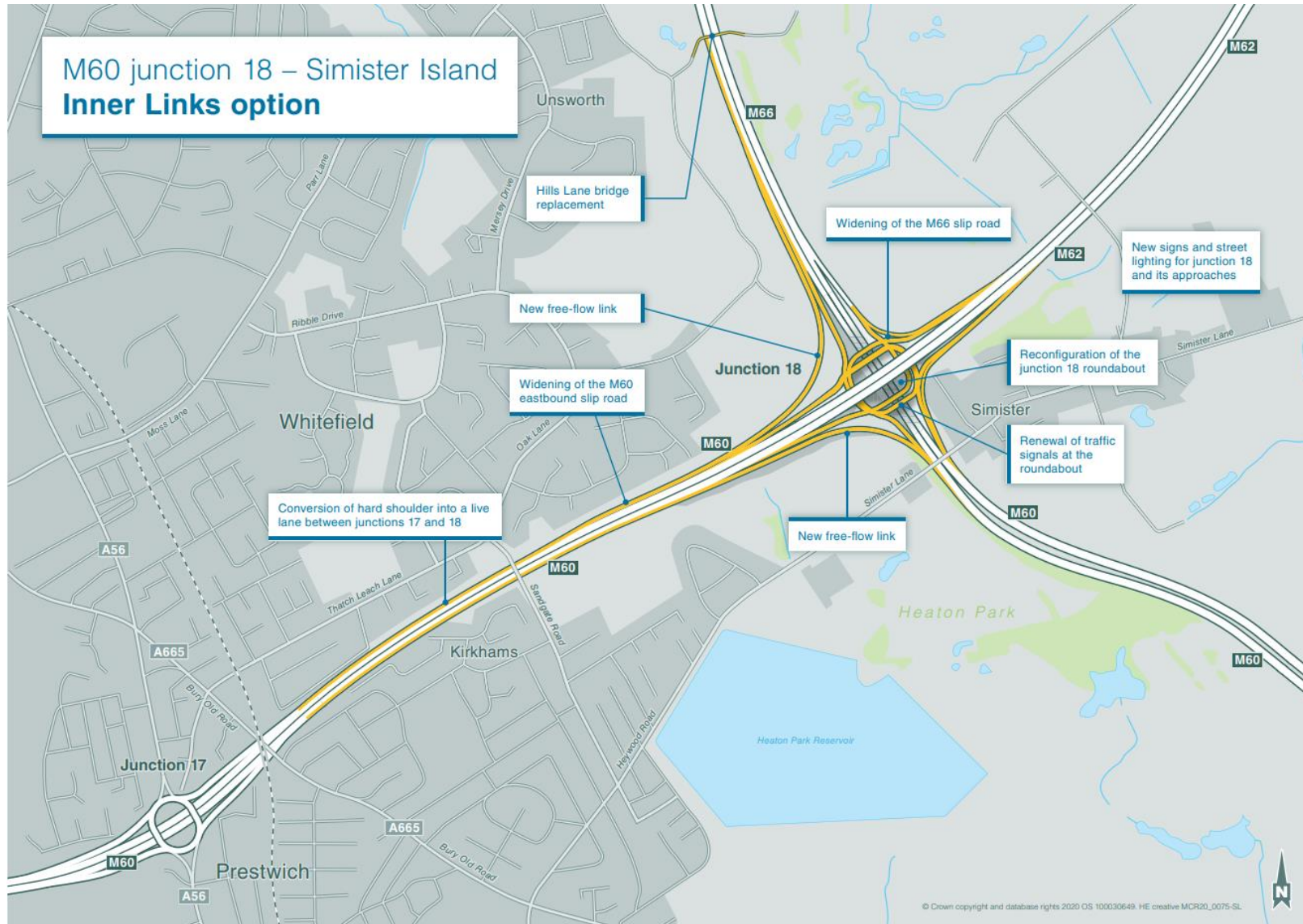
- 2.2.1 The scheme design is being developed through a process in which the ongoing Environmental Impact Assessment identifies measures that are needed to protect or enhance sensitive environmental features. This includes measures such as refining the layout and height of the scheme design, reducing the amount of land required for temporary construction works and the amount of land required permanently for the scheme and altering construction methods.
- 2.2.2 Environmental considerations have been a key factor in developing the preliminary design which is now subject to statutory consultation. The ongoing design development and refinement will continue to be influenced by the Environmental Impact Assessment process.
- 2.2.3 We have developed the following design objectives in relation to the environment for the scheme:
- 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 proposed planting into the landscape to provide visual screening.
 - Maximise biodiversity gain 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 design as much as possible, including when considering the design and location of drainage ponds.
 - Integrate drainage and 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 attenuation ponds, to integrate these features into the landscape and provide greater biodiversity enhancement.
 - Improve the quality and capacity of existing walking, cycling and horse riding infrastructure, , and provide visual interest for local residents, users of public rights of way and public open space.
- 2.2.4 We have also identified mitigation measures to avoid or prevent environmental impacts through the scheme design (known as embedded mitigation) (see **Section 2.3** for further details). In addition, we will apply standard construction and operational management practices for avoiding and reducing environmental effects (known as essential mitigation).

2.3 Scheme development and alternatives considered

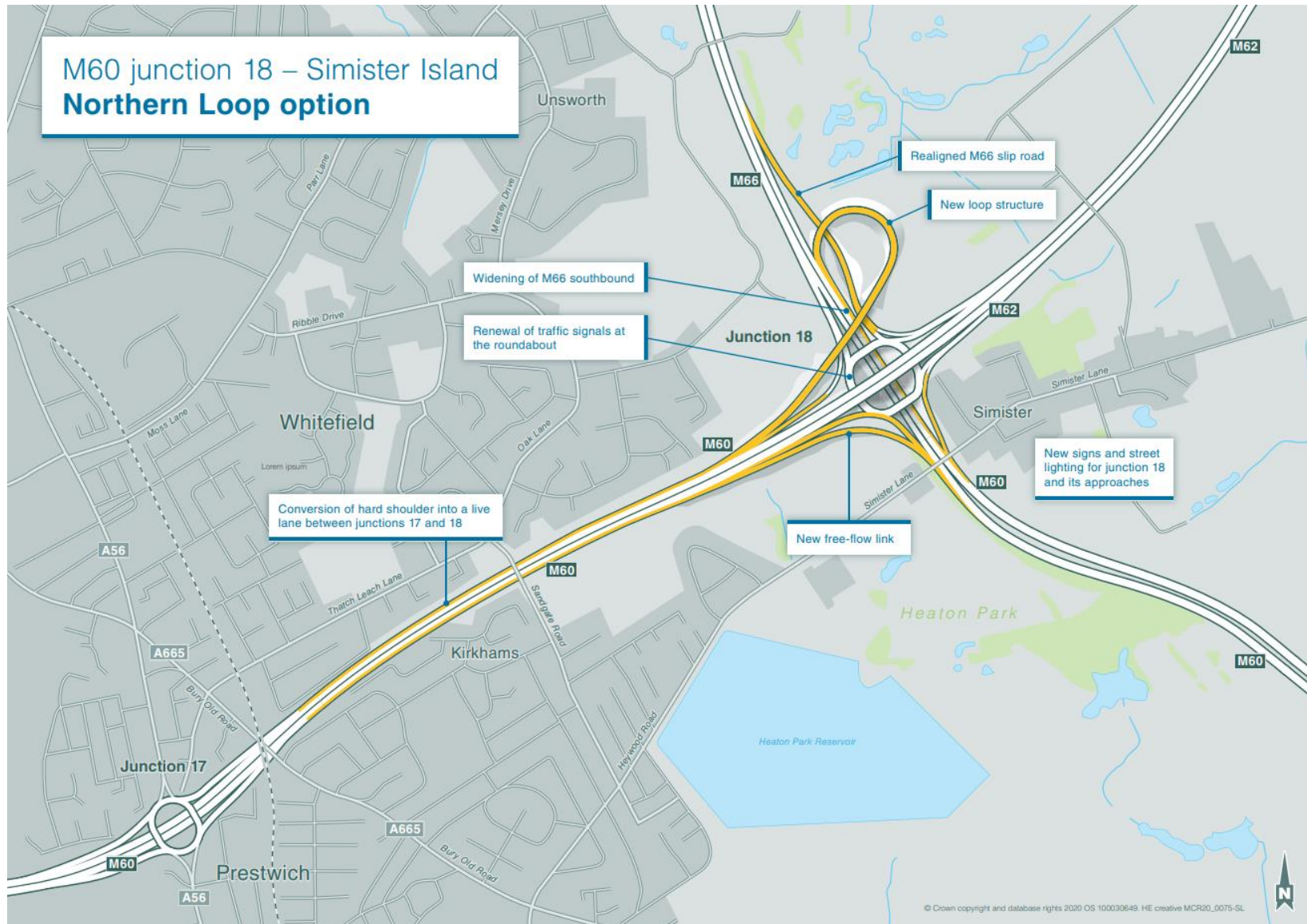
- 2.3.1 148 potential improvement options were identified for the scheme in 2015, with five options initially taken forward for further assessment. After further consideration two

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 the **Inner Links** and **Northern Loop** option illustrations), were selected for public consultation.

The 'Inner Links' option presented at public consultation



The 'Northern Loop' option presented at public consultation



- 2.3.2 During our 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. The Northern Loop is our preferred option as it would provide greater capacity on the interchange and improve journey times to a greater extent compared with the Inner Links.
- 2.3.3 The ongoing Environmental Impact Assessment process following initial public consultation has influenced the design development of the Northern Loop. Examples of where we have altered the scheme design to avoid or reduce environmental impacts include:
- Changing the height of the Northern Loop so that the M66 southbound diverge link goes onto a bridge, rather than under the Northern Loop, to reduce the volume of earthworks needed to construct the scheme
 - Siting an attenuation pond (a pond that holds water received from paved surfaces during heavy rainfall to reduce flooding) to the north of the M60, rather than within Philips Park Local Nature Reserve, to avoid impacts to sensitive habitats
 - Accessing Philips Park Local Nature Reserve via the M60 in order to construct a new culvert (a structure that allows water to flow under a road), rather than through the park, to minimise loss of habitat and ancient woodland within the Local Nature Reserve
 - Avoiding works to widen the motorway and install hard shoulder provision outside Prestfield Court (Kensington Street). In order to avoid clearance of vegetation along the highway verge which screens some views of the motorway for residents at Prestfield Court. The scheme design was changed so that hard shoulder provision would start further east of Prestfield Court and additional hard shoulder provision was accommodated into the scheme design at Haweswater Aqueduct/Underpass.
- 2.3.4 The preferred option for the scheme was selected based on several factors, including environmental impacts, journey times, complexity of build, affordability, and feedback from the public. For more information on the previous consultation results and the preferred route announcement, please visit our webpage at www.nationalhighways.co.uk/M60-Simister-Island.
- 2.3.5 Since announcing the Northern Loop as our preferred option, we've been reviewing the design of the proposal. As part of this the following alternatives which incorporate a hard shoulder into the design of the stretch of motorway between junctions 17 and 18 of the M60 have been considered:
- Increase the number of lanes between M60 junctions 17 and 18 from four to five lanes in each direction and additionally create a “full” hard shoulder, which would bring the motorway very close to residential properties and require some land from residential properties in some locations. This option was called ‘Option 1’.
 - Increase the number of lanes between M60 junctions 17 and 18 from four to five lanes in each direction and additionally create a discontinuous hard shoulder, with the aim of minimising permanent land requirements and impacts to residential properties. Where possible a hard shoulder would be installed keeping within the Highways Boundary (the extent of the publicly maintained highway managed by

National Highways) that would minimise impacts on residential properties. This option was called 'Option 2'.

- Retain the current number of lanes between M60 junctions 17 and 8 (four lanes in each direction) and existing hard shoulder. This option was called 'Option 3'.

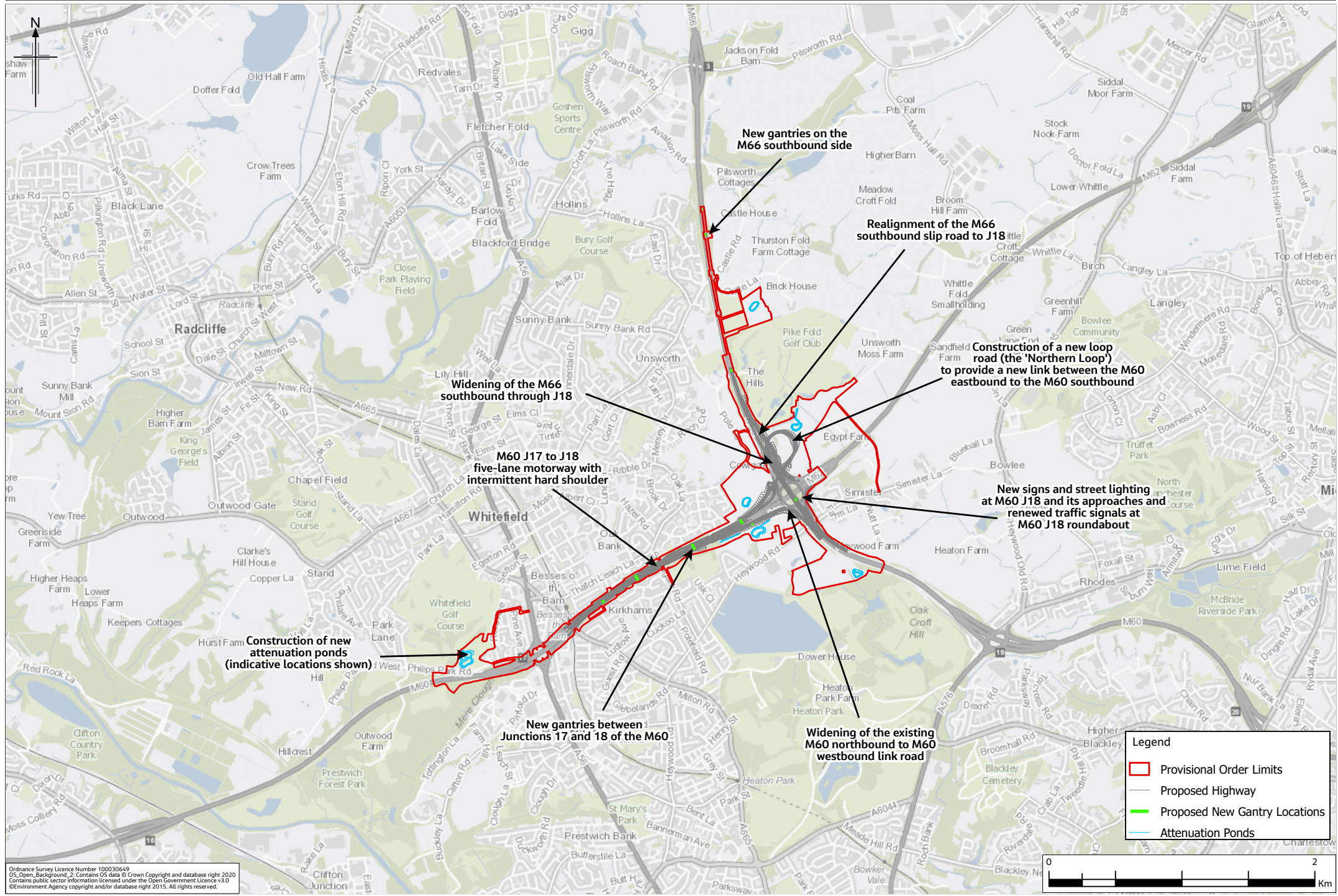
2.3.6 Following an environmental risk assessment and taking into account other considerations such as scheme cost, viability, programme and deliverability, operational safety, engineering and construction challenges and risks, and legal and statutory process challenges and risks, it was recommended that Option 2 should be progressed at PCF Stage 3.

2.4 Key features of the scheme

Scheme design

2.4.1 An overview of the scheme is provided below. Further detail is shown on the General Arrangement Plans (in Map Book 1 of the statutory consultation).

An overview of the Proposed Scheme design



2.4.2 The key elements of the scheme are:

- Widening of the M60 carriageway between junction 17 and 18 from four lanes to five lanes in both directions and installation of a discontinuous hard shoulder. By introducing this layout, traffic joining the M60 at one junction and leaving at the next will 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 will 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 junction 18 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 junction 18 roundabout will be closed for general use
- Realignment of the M66 southbound slip road to junction 18 to accommodate the Northern Loop structure, including a new overbridge where the slip road crosses the Northern Loop and realignment of the left turn lane to the M62 eastbound
- Renewal of signs and signals, including new signs and street lighting at M60 junction 18 and its approaches, renewed traffic signals at the M60 junction 18 roundabout, and new gantries on the M66 southbound side and between junctions 17 and 18 of the M60
- Construction of new attenuation ponds to accommodate surface water run-off from the highway and improve water quality

Construction

Construction programme

2.4.3 We expect construction to start in 2025 and take approximately three years. For the first few months, the construction would likely focus on preparing the area for the main construction works to begin, such as setting up temporary construction compounds, moving utility pipes and cables, archaeological work (if required), and environmental protection work (if required).

Environmental management

2.4.4 All construction work would be done with appropriate environmental controls in place, in line with an Environmental Management Plan. This would include 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

2.4.5 Traffic management (for example, temporary traffic lights, lane closures, contraflows and overnight road closures) would be included in a Traffic Management Plan.

Site compounds

2.4.6 The main site compound is likely to be located to the north-west of M60 junction 18 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 enabling works (the works identified under the **Construction programme** section above) phase of the project only, and via a temporary haul road off the M60 eastbound to M66 northbound link to allow construction vehicles to transport construction materials.

2.4.7 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 junction 18 on a daily basis. These smaller site compounds will be subject to further review and may decrease in size and number depending on how the scheme design and work programme develops.

Construction noise and working hours

2.4.8 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 we would take steps such as timing construction to minimise work outside normal working hours where possible, using low-noise equipment and temporary noise barriers.

2.4.9 To reduce the impact on residents, most construction work would be done during normal daytime working hours. Our normal daytime working hours would probably be between 7.30am and 6pm Monday to Friday, and between 7.30am and 1pm on Saturdays. In addition, there may be an hour before or after these times when we are setting up or closing down the site (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).

2.4.10 During the summer months, working hours may extend from 7am to 7pm. These are standard working hours for infrastructure projects across the country. Work done outside of these hours or on bank holidays is considered off-peak work.

2.4.11 There would be some instances when work would 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 we are constructing new bridges or gantries over the motorway.

2.4.12 We will discuss the exact details of construction working hours with the local authorities and these will be detailed in our Environmental Management Plan.

Reducing construction traffic on local roads and traffic management

2.4.13 To reduce the amount of construction traffic on the existing roads, construction traffic would use temporary roads where possible. These are likely to be close to the existing M60, M62 and M66 routes. However, where this is not possible, additional land within the provisional Order Limits (the land required for temporary construction works and permanent land required for the scheme) may need to be used temporarily.

2.4.14 Where the existing road is to be widened, we would keep the road open but have roadworks that make the existing lanes on the motorway narrower and implement lower speed limits.

2.4.15 By locating our site compounds near the existing motorway and using temporary roads, we would aim to limit the number of Heavy Goods Vehicles using local roads.

2.4.16 We would also use shuttle buses to take workers from local transport hubs (e.g. bus depots or railways stations) to and between the site compounds.

3. The Environmental Impact Assessment

3.1 Environmental scoping

3.1.1 An Environmental Scoping Report was produced to set out the preliminary design of the scheme, alternative design options considered, existing baseline environmental conditions, likely significant environmental effects resulting from the scheme, the proposed scope and assessment methodology for the Environmental Impact Assessment, and the proposed structure of the Environmental Statement.

3.1.2 The Environmental Scoping Report was submitted to the Planning Inspectorate on 2 July 2021 in PDF and interactive digital formats. The PDF and digital formats of the Environmental Scoping Report can be viewed on the Planning Inspectorate's website under 'National Infrastructure Applications' or at the following links:

- PDF:

<https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/TR010064/TR010064-000013-TR010064%20-%20Scoping%20Report%20PDF%20VERSION.pdf>

- Digital report:

<https://experience.arcgis.com/experience/4409d244b5f34f77a996047d4165fb38>

3.1.3 The digital format presents the same project information as the PDF format of the Environmental Scoping Report and can be viewed using recent versions of the Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge web browsers. Guidance on how to use the digital report is available at the link in paragraph 3.1.2 and also provided here:

<https://jacobs.maps.arcgis.com/sharing/rest/content/items/1482b2f9f6274d8fb69dca2940c4119c/data>

3.1.4 The Planning Inspectorate reviewed and consulted on the Environmental Scoping Report and published a Scoping Opinion on 12 August 2021, which can be viewed on the Planning Inspectorate’s website under ‘National Infrastructure Applications’ or at the following link:

<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010064/TR010064-000030-TR010064%20-%20Scoping%20Opinion.pdf>

3.2 Basis of the PEIR

3.2.1 The PEIR has been prepared at an interim stage of the scheme’s preliminary design process. Stakeholder feedback received during the statutory consultation will be considered and could influence the design. There could therefore be changes to the provisional Order Limits (the application land boundary) to allow for changes in temporary working areas, or changes in the amount of land needed for the scheme design and its environmental mitigation areas.

3.2.2 The provisional Order Limits presented in the PEIR are considered a realistic estimate of how much land is likely to be needed to deliver the junction improvements. These are likely to be refined as we get closer to an application for development consent being submitted.

3.2.3 The PEIR therefore represents a ‘snapshot in time’ of the ongoing environmental assessment process. It does not report the full results of the Environmental Impact Assessment, which will be presented in the upcoming Environmental Statement that will be submitted with the application for development consent. As such, the environmental information presented in the PEIR is based on assessment and survey data available at the time of writing the report.

3.3 Surveys and assessment

3.3.1 Environmental surveys have been carried out to inform the environmental assessment, with further surveys to be undertaken in 2023. The following surveys have been undertaken or are due to be undertaken:

- Ecology surveys, including for habitats, bats, birds (including protected and notable species such as barn owls), badgers, great crested newts, otters, water vole, reptiles and terrestrial invertebrates (animals without a backbone that live on land, such as insects)
- Landscape winter and summer surveys
- Arboriculture (tree) surveys
- Air quality monitoring
- Cultural heritage site walkover (an inspection of the site and its surrounding area) survey
- Noise monitoring
- Agricultural Land Classification (an assessment of the quality of agricultural land) soil surveys

- Soil resource survey
- Assessment of the condition and physical features of rivers and streams
- Floating water plantain (a plant that lives on water) survey
- Ground investigation surveys
- Groundwater Dependent Terrestrial Ecosystem (wetlands whose vegetation is dependent on groundwater) survey

3.3.2 Most of the surveys listed in paragraph 3.3.1 were undertaken in 2021 and 2022. Additional barn owl, bat activity, terrestrial invertebrate, arboriculture, ground investigation and GWDTE surveys are due to be undertaken in 2023 to inform the environmental assessment.

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

3.4 Environmental aspects

3.4.1 The PEIR 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 proposed developments (cumulative effects). The conclusions from the preliminary assessment of these aspects are summarised in the following sections of this Non-Technical Summary.

3.4.2 In line with regulatory requirements, the PEIR also considers:

- 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)

3.4.3 The preliminary assessments of the aspects listed above (paragraph 3.4.2) have identified that the scheme is unlikely to result in any significant environmental effects, and they have therefore been scoped out of the assessment.

4. Preliminary environmental assessment

4.1 Air quality

Introduction

4.1.1 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).

- 4.1.2 We have carried out a preliminary air quality assessment to assess likely changes in concentrations of air pollutants and rates of nitrogen deposition as a result of the scheme.
- 4.1.3 In line with recognised guidance, the preliminary assessment for air quality has focused on the air quality objective and Limit Value for nitrogen dioxide, which is a pollutant contained within road traffic exhaust emissions which is harmful to human health. In addition, ecological receptors have been assessed in order to understand potential changes in rates of nitrogen deposition (the transfer of nitrogen from the atmosphere to vegetation and habitats).
- 4.1.4 The study area for the air quality assessment is 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 at human receptors were assessed in comparison to the air quality objective. The risk of exceeding the Limit Value for nitrogen dioxide at the roadside or for a significant increase in nitrogen deposition at ecological receptors was also assessed.

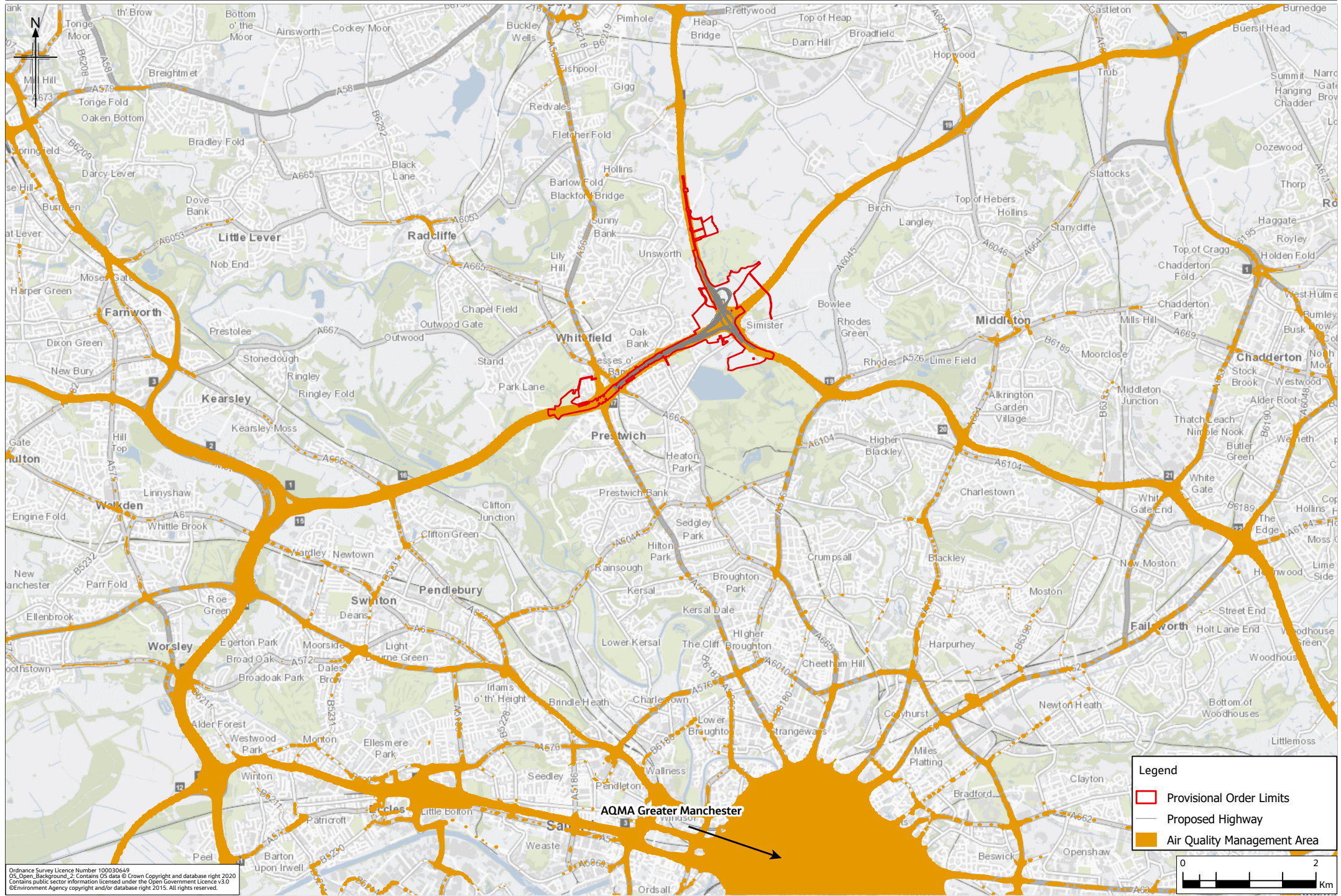
Baseline environment

- 4.1.5 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 2019. We also installed additional temporary monitoring sites along the scheme route and in the general vicinity in 2021. This monitoring recorded potential exceedances of the nitrogen dioxide air quality objective at a number of locations within 1km of the network of affected roads.
- 4.1.6 Air Quality Management Areas (AQMAs) are locations identified by local authorities where specific measures are needed to reduce emissions in order to meet the UK's air quality objectives. There is one AQMA for the whole of Greater Manchester covering the scheme and a number of other key roads in the area.
- 4.1.7 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, compliance with the Limit Value is projected to be achieved.
- 4.1.8 Features which are sensitive to changes in air quality near the network of affected roads, and which have been considered in the air quality assessment, are as follows:
- **Human health features** – these are locations that are sensitive to air quality, including residential properties and buildings used by the young, elderly and other vulnerable populations, such as schools and hospitals. We have also considered a

potential residential development next to the scheme at the request of Bury Metropolitan Borough Council.

- **Ecological features** – these are designated ecological sites (such as an ancient woodland site, Local Nature Reserve, and local sites of biological importance) close to the network of affected roads where nitrogen deposition from vehicle exhaust emissions could potentially affect plant health and productivity.
- **Compliance risk features** – these are publicly accessible locations (such as footpaths) or human health features (as described above) near to affected roads at which compliance with air quality Limit Values is assessed.

Greater Manchester Air Quality Management Area



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Effects during construction

- 4.1.9 A screening assessment of preliminary estimates of changes in traffic flows during the construction phase suggests that construction traffic is unlikely to exceed relevant traffic scoping criteria. On this basis, construction phase traffic is considered unlikely to have a significant effect on local air quality. Updated estimates of construction traffic will be considered within the Environmental Statement.
- 4.1.10 We would use well established mitigation measures to control dust emissions during construction, such as 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, it is unlikely there would be significant effects resulting from dust.

Effects during operation

- 4.1.11 The preliminary assessment has identified that there are some locations where air quality is worsened and some where it is improved. No perceptible worsening in air quality is modelled (i.e. predicted through computer modelling) to occur at receptors where the air quality objective is exceeded with or without the scheme. The largest improvements in air quality are modelled to occur at a small number of receptors where the air quality objective is exceeded without the scheme. 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**. Further modelling will be undertaken for the Environmental Statement based on updated traffic modelling results.
- 4.1.12 The nitrogen deposition assessment showed that that there is the potential for significant effects to occur at two ecological sites (Clifton Country Park Local Nature Reserve and Rhodes Farm Sewage Works local wildlife site) during operation. Effects on these sites will be assessed in the biodiversity chapter of the upcoming Environmental Statement.
- 4.1.13 The air quality model confirmed that concentrations of nitrogen dioxide at specific roadside locations used to report on compliance with air Limit Values are within the acceptable value set in law.

Conclusion

- 4.1.14 With standard construction phase mitigation measures in place, it is unlikely there would be significant air quality effects resulting from construction dust.
- 4.1.15 For human receptors, **no significant effects** from changes in air quality are expected. Effects from changes in nitrogen deposition are possible for two ecological sites. It is considered that there is no risk of the scheme affecting the UK's reported ability to comply with air quality Limit Values in the shortest timescale possible. These conclusions will be further explored in the Environmental Statement.

4.2 Cultural heritage

Introduction

- 4.2.1 Cultural heritage includes archaeological remains, historic buildings and other structures, and historic landscapes including designated parks and gardens. A preliminary assessment of heritage assets has been undertaken. The assessment considers the historic change of the landscape and potential effects on the setting of heritage assets.

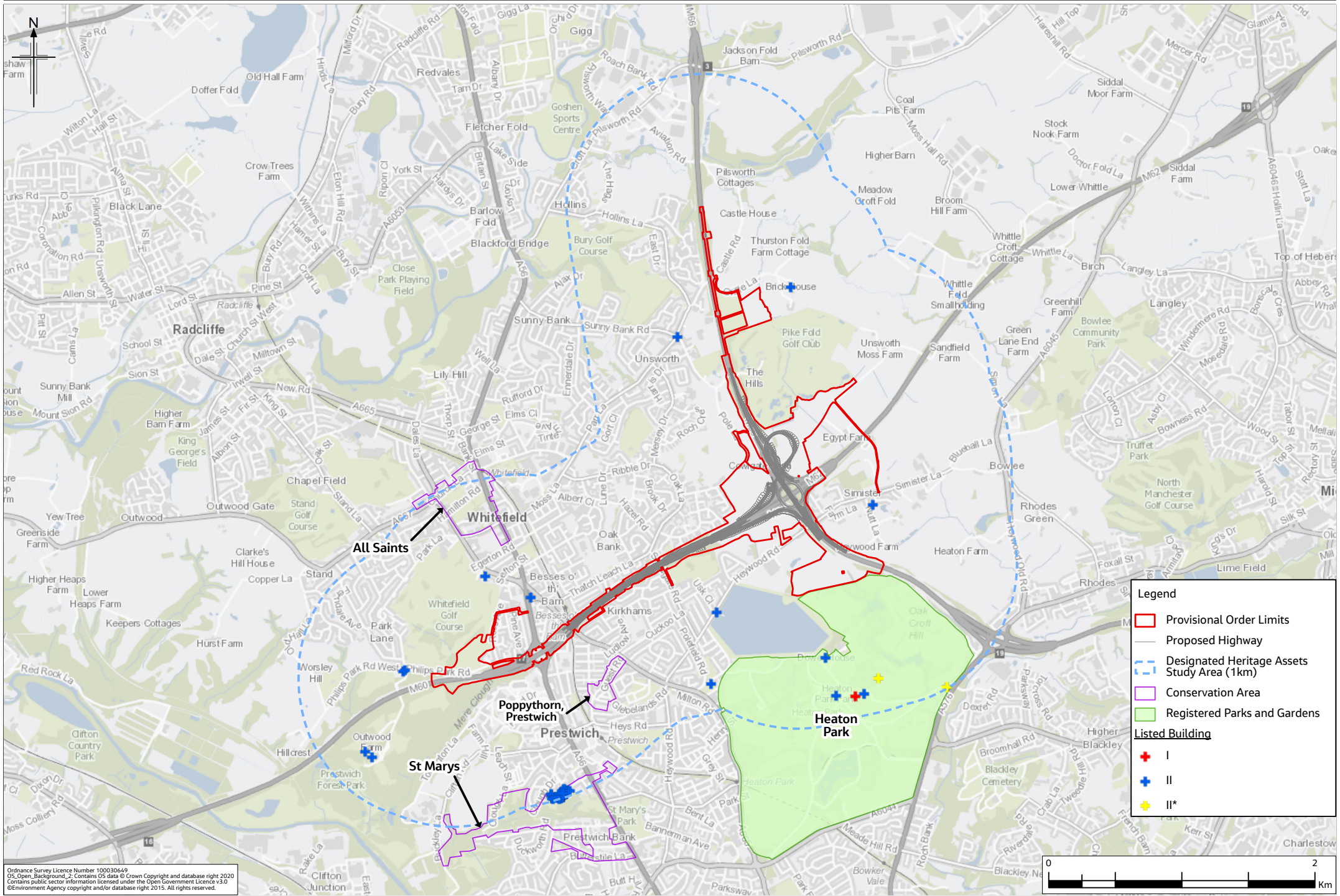
Baseline environment

- 4.2.2 To understand archaeological remains which are not legally protected (non-designated), we have used a study area which includes the area within the provisional Order Limits and a zone extending 300m from the edge of that boundary. For designated (legally protected) heritage assets, such as listed buildings and scheduled monuments, we have used a 1km study area. By doing this, we can take an asset's setting (the surroundings in which the historic asset is experienced) into account. We have also used the landscape and visual study (see **Section 4.3: Landscape and visual**) to aid us in addressing how setting might be affected.
- 4.2.3 A cultural heritage walkover survey has been carried out for the upcoming Environmental Statement.

Designated cultural heritage assets

- 4.2.4 Buildings designated for special historic or archaeological interest are known as listed buildings. There are three listed historic buildings and structures within 300m of the provisional Order Limits, with a further 38 within the wider 1km study area.
- 4.2.5 Conservation Areas are areas designated by local authorities for special historic or architectural interest. The Poppythorn, All Saints (Whitefield) and St Mary's (Prestwich) Conservation Areas are located within the 1km study area.
- 4.2.6 Parks and gardens designated for special historic interest are known as Registered Parks and Garden. Heaton Park, a Grade II listed Registered Park and Garden, is close to the provisional Order Limits where there would be a proposed attenuation pond.

Designated Cultural Heritage Assets



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Non-designated cultural heritage assets

- 4.2.7 There are no legally protected assets within the provisional Order Limits, but there are nine non-protected archaeological sites within the same area including those overlapping into the provisional Order Limits. The extent to which these sites have survived is unknown.
- 4.2.8 There are a further 48 non-designated archaeological assets and 14 non-designated historic buildings within 300m of the provisional Order Limits. Two of these are adjacent to the provisional Order Limits at M60 junction 18.

Effects during construction

- 4.2.9 There will not be any physical impacts to designated heritage assets during construction. These sensitive receptors are mostly too far away from the area affected by construction activity to be affected. Heaton Park Registered Park and Garden would not suffer any adverse effects during construction.
- 4.2.10 Physical impacts may occur to the known archaeological assets within the provisional Order Limits. This will also apply to archaeological remains that are presently unknown, as well as historic landscape elements such as field boundaries.
- 4.2.11 The negative 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 will be informed by a programme of investigation which will determine the presence or absence of such remains and inform both the Environmental Statement and a robust mitigation strategy. Investigation will be carried out after consultation with the Greater Manchester Archaeological Advisory Service.
- 4.2.12 Overall, the preliminary assessment has concluded there would be **no significant adverse effects** on heritage assets during construction.

Effects during operation

- 4.2.13 There will not be any physical or setting effects on archaeological remains during operation of the scheme.
- 4.2.14 Any effects arising from the operational stage would relate to the setting of historic assets in close proximity to the scheme, notably two non-designated historic buildings adjacent to M60 junction 18. The impacts to setting would arise from changes to setting, including increased visual intrusion, additional noise and lighting. Visual impacts are likely to be reduced through landscape design.
- 4.2.15 No listed buildings, Conservation Areas or the Registered Park and Garden would suffer any adverse effects during operation of the scheme.
- 4.2.16 Overall, the preliminary assessment has concluded that there would be **no significant adverse effects** on heritage assets during operation.

Conclusion

- 4.2.17 The preliminary assessment has concluded that there would be **no significant adverse effects** on heritage assets during construction and operation of the scheme.
- 4.2.18 The scheme would have a direct physical effect on archaeological remains within the provisional Order Limits, although these can be offset using mitigation. The need for, and scope of, mitigation will be determined by a programme of investigation after discussion with local archaeological stakeholders.
- 4.2.19 Impacts to the setting of the two non-designated historic buildings adjacent to M60 junction 18 are the only likely outcome of the scheme once completed. The full extent of these will be determined on further study, though it is likely they will be partly offset by landscaping.

4.3 Landscape and visual

Introduction

- 4.3.1 A preliminary assessment of the effects on landscape character and views likely to arise due to the scheme has been undertaken. The preliminary assessment considers whether landscape and visual effects are likely to be significant during construction, and during operation (in winter of the opening year and the summer of the future year, 15 years after the opening year).
- 4.3.2 Surveys undertaken during summer and winter 2021 and during summer 2022 have focused on potentially significant effects within a 2km radius of the scheme.

Baseline environment

- 4.3.3 The landscape within the study area is heavily influenced by the motorway transport corridors, with M60 junction 18 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.

View east towards M60 junction 18 from Sandgate Road



4.3.4 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, linear tree belts along the motorway corridors and other groups of vegetation. North-east of junction 18 of the M60 the landscape is fairly flat and open, and the motorway is visible from footpaths in these areas, though hedgerows and woodlands limit some near and middle-distance views from rural properties.

View south-west from Griffie Lane across Pike Fold Golf Course towards M60 junction 18 and the proposed location of the Northern Loop



4.3.5 Motorway lighting is visually prominent from urban areas located near the motorway corridors and M60 junction 18 and from the more undeveloped rural area to the east.

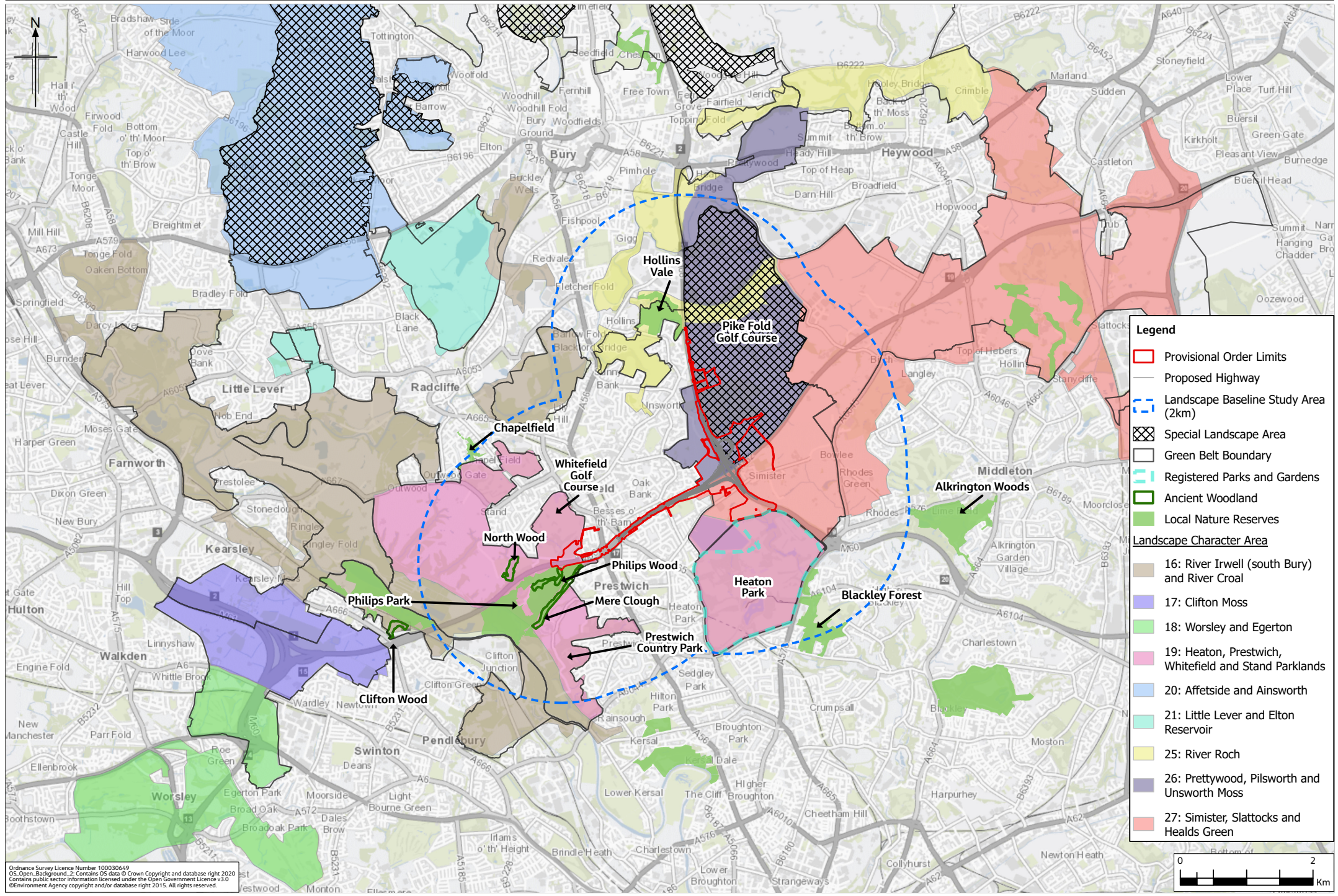
4.3.6 Elevated areas within Heaton Park Registered Park and Garden allow some very limited views to the M60 corridor, although woodland within Heaton Park and along the highway boundary provides a high level of screening.

Landscape

4.3.7 Key features within the study area relevant to landscape include:

- **Four landscape character areas (LCA)** (LCAs are geographical areas with a broadly consistent landscape character, e.g. similar landforms, land use or vegetation cover)
- **One townscape character area (TCA)** (TCAs 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)
- **Special Landscape Area EN9/1** (Special Landscape Areas are landscapes designated for their local importance, e.g. environmental, cultural or visual importance) located east of the M66 and north of the M62 and extending east to Moss Hall Road
- **Green Belt** land (the purpose of Green Belt is to safeguard open land from urban sprawl)
- **Ancient woodland within Philips Park**, south-west of M60 junction 17, and trees within the study area protected by tree preservation orders
- **Heaton Park Registered Park and Garden**, including a number of Grade II listed buildings within the park boundary, and other cultural heritage features (refer to **Section 4.3: Cultural heritage**)
- **Public footpaths** (including on overbridge, crossing Whitefield Golf Course, and Prestwich Country Park and Pike Fold Golf Course) from which the motorway can be viewed

Landscape Baseline



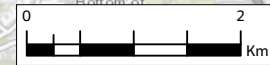
Legend

- Provisional Order Limits
- Proposed Highway
- Landscape Baseline Study Area (2km)
- Special Landscape Area
- Green Belt Boundary
- Registered Parks and Gardens
- Ancient Woodland
- Local Nature Reserves

Landscape Character Area

- 16: River Irwell (south Bury) and River Croal
- 17: Clifton Moss
- 18: Worsley and Egerton
- 19: Heaton, Prestwich, Whitefield and Stand Parklands
- 20: Afftside and Ainsworth
- 21: Little Lever and Elton Reservoir
- 25: River Roch
- 26: Prettywood, Pilsworth and Unsworth Moss
- 27: Simister, Slattocks and Heads Green

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Visual

4.3.8 Potential visual receptors within the study area include:

- Residents within settlements of Whitefield, Unsworth, Prestwich and Simister and within the rural area to the north-east of the M60
- Users of the public rights of way network
- Visitors to Heaton Park Registered Park and Garden
- Visitors to Public Open Spaces such as Philips Park, Thatch Leach Lane Playground, Fusilier's Meadow, Boz Park, and Hollins Vale Local Nature Reserve
- Visitors to private open space including allotments, playing fields, Heaton Park Golf Course, Whitefield Golf Course, Pike Fold Golf Course, Unsworth Cricket Club
- People at their places of work, such as within nearby schools and businesses on the peripheries of the motorway corridor and travellers on the road network

Effects during construction

4.3.9 The key elements of the scheme which would result in landscape and visual effects at the construction stage include:

- **Widening of the existing M60/M62 Mainline between junctions 17 and 18**, resulting in changes to landform (the shape of the land) and loss of vegetation, and opening up people's views to the motorway
- **Construction of the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge**, resulting in changes to the landform from excavation, soil stripping and earthworks across a wide area and an increase in motorway infrastructure within the rural fringe landscape
- **Construction of the M66 southbound diverge**, resulting in changes to landform and loss of vegetation, and opening up people's views to the motorway
- **Construction of the M60 northbound to M60 westbound motorway link road**, resulting in changes to landform and loss of vegetation and the opening up of people's views to the motorway corridors

View west from Egypt Lane towards M60 junction 18 and the proposed location of the Northern Loop



- 4.3.10 Other temporary activities during the construction phase that would result in likely significant landscape and visual effects during construction include movement of construction machinery, excavation and earthworks, the presence of compounds, temporary haul roads, temporary construction lighting, stockpiled soil and materials, and loss of vegetation.

Landscape character effects

- 4.3.11 The scheme would increase the prominence of major highway infrastructure within the landscape. LCA 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, the widening of the M60 between junctions 17 and 18 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 attenuation ponds, would change the landscape quality and character of the LCA and the Special Landscape Area.
- 4.3.12 TCA Prestwich, Whitefield, Radcliffe and Unsworth Residential would be **significantly affected** by the widening of the M60 between junctions 17 and 18. Sections of linear tree belts that provide some enclosure of the motorway and separation from adjoining residential areas would be removed increasing the prominence of the motorway within the wider townscape character area.
- 4.3.13 There would be **no significant effects** for the other Landscape Character Areas within the study area due to localised and smaller scale construction works set within the context of the highway infrastructure and surrounding largely urban environment.

Visual effects

- 4.3.14 Road widening would bring traffic closer and also require removal of linear tree belts. Views from individual rural properties to the east of junction 18, views from properties along the M60 between the A665 Bury Old Road and M60 junction 18 and views from properties in the vicinity of M60 junction 18 are likely to experience the greatest change following removal of highways woodland belts and vegetation.
- 4.3.15 The presence of construction elements, 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.
- 4.3.16 The greatest change in people's views from construction activities would be from residential settlement edges north and south of the M60 to the east of the A655 Old Bury Road, locations in the vicinity of M60 junction 18, and for individual residential properties within the rural area to the east, and also footpaths that run close to, or cross, the scheme. These changes are considered likely to result in **significant adverse effects** during construction.
- 4.3.17 We are considering embedded mitigation measures to integrate the road into the local environment and minimise the impact of the scheme on the landscape. Measures are likely to include:
- Junction design to reduce the effects on landform; retain vegetation, field pattern, and landscape features; and reduce the effects on people's views
 - Considerate design of major structures, signage and gantries to limit visual intrusion
 - Refinement of the design of earthworks that achieve better integration with the surrounding landform, where space and material are available
 - Use of sensitive lighting design to stop upwards light and direct lighting to the highway
 - Native tree and shrub planting to break up the scale of the road, help screen new highways structures, traffic and lighting and help integrate the scheme into the existing landscape pattern
- 4.3.18 We are also considering essential mitigation measures, including tree protection measures, storage of soil in embankments around temporary works to provide temporary visual screening, site security fencing, keeping temporary lighting to a minimum, and restoring areas not required for permanent works.

Effects during operation

- 4.3.19 Adverse landscape and visual effects would be caused by the completed scheme and its operation. This would include the widening of the M60 between junctions 17 and 18, the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge, the motorway link roads and new lighting columns, gantries, road signals and signs. There would be residual effects from the vegetation clearance before mitigation planting becomes established.

Landscape character effects

- 4.3.20 During operation in the first winter after the scheme is open, before planted mitigation would have established, it is likely that there would continue to be **significant landscape effects** on one landscape character area (LCA 26) and the Special Landscape Area and on TCA Prestwich, Whitefield, Radcliffe and Unsworth Residential due to the widened M60 between junctions 17 and 18, the presence of the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge and M66 southbound diverge, and vegetation clearance during construction. However, by the summer of year 15 (i.e. 15 years after the scheme is open), it is likely that the established planted areas would provide integration and reduce the prominence of the scheme, resulting in **no significant landscape effects**.
- 4.3.21 There would be **no significant effects** on the other LCAs within the study area during operation due to the localised nature and small scale of changes.

Visual effects

- 4.3.22 During operation in the first winter after the scheme is open, following completion of all construction but before planted mitigation would have established, it is likely that there would continue to be **significant visual effects** on people's views from some 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). These impacts on views are considered likely to be significant from the residential settlement edges to the north and south of the M60 east of the A665 Bury Old Road and in the vicinity of the M60 junction 18, for individual residential properties within the rural area to the east, and also footpaths that run close to, or cross, the scheme.
- 4.3.23 By the summer of year 15 mitigation planting would have established which, when combined with other surrounding vegetation when in leaf, would reduce visibility or screen the scheme resulting in **no significant adverse effects** on views from most locations.

Conclusion

- 4.3.24 Due to the scale and nature of the scheme, there would be **significant adverse effects** on landscape and townscape character and people's views from some locations during the construction phase.
- 4.3.25 During the opening year of the scheme there would continue to be **significant adverse effects** on landscape and townscape character and people's views from some locations as mitigation planting would have not sufficiently established. However, 15 years after opening of the scheme these effects would become **not significant** due to mitigation planting having established.

4.4 Biodiversity

Introduction

- 4.4.1 Biodiversity is the biological variety and variability of life on earth and the ecological complexes that they are a part of. Construction, improvement and maintenance of roads can result in environmental effects on biodiversity. In addition, biodiversity is the

subject of a wide variety of legislation and policies; impacts to ecological receptors could constitute an offence under relevant legislation as well as comprising material considerations within the planning system.

Baseline environment

4.4.2 The main areas of construction activity, construction compounds, storage areas, haul roads and drainage outfalls included in the provisional Order Limits have been included within the study areas for the preliminary biodiversity assessment. The following sections describe the study area for each species of biodiversity or type of designated site and describes the baseline environment for biodiversity features. Designated ecological sites within 200m of the network of roads being assessed for changes in air quality (see **Section 4.1: Air quality**) have been included within the study area.

Special Areas of Conservation

4.4.3 Special Areas of Conservation (SACs) are legally protected to protect and conserve sites of European interest for biodiversity. The study area extends up to 30km around the provisional Order Limits for SACs designated for bats but extends to 2km for all other SACs. Rochdale Canal SAC is the only SAC within the study area, located 6.5km east and south-east of the provisional Order Limits and is within 200m of the network of affected roads. The SAC is designated for its population of one particular plant called water plantain.

Local Nature Reserves

4.4.4 Local Nature Reserves (LNRs) are legally protected ecological sites designated for their local scientific interest. The study area for statutorily designated sites is 2km, with additional sites included where they are within 200m of the network of affected roads.

4.4.5 Philips Park, Hollins Vale, and Mere Clough LNRs are located within 1km of the provisional Order Limits and there are four LNRs near the network of roads being assessed for changes in air quality.

Sites of Biological Importance

4.4.6 Sites of Biological Importance (SBIs) are not legally protected but are designated in order to protect local sites of biological diversity. SBIs have been considered within a study area of 1km from the provisional Order Limits.

4.4.7 There are nine SBIs within this study area, including Philips Park and North Wood, Hollins Plantation, Hazlitt Wood, Hollins Vale, and Heaton Park Reservoir. There are 11 SBIs near the network of roads being assessed for changes in air quality.

Priority habitats and ancient woodland

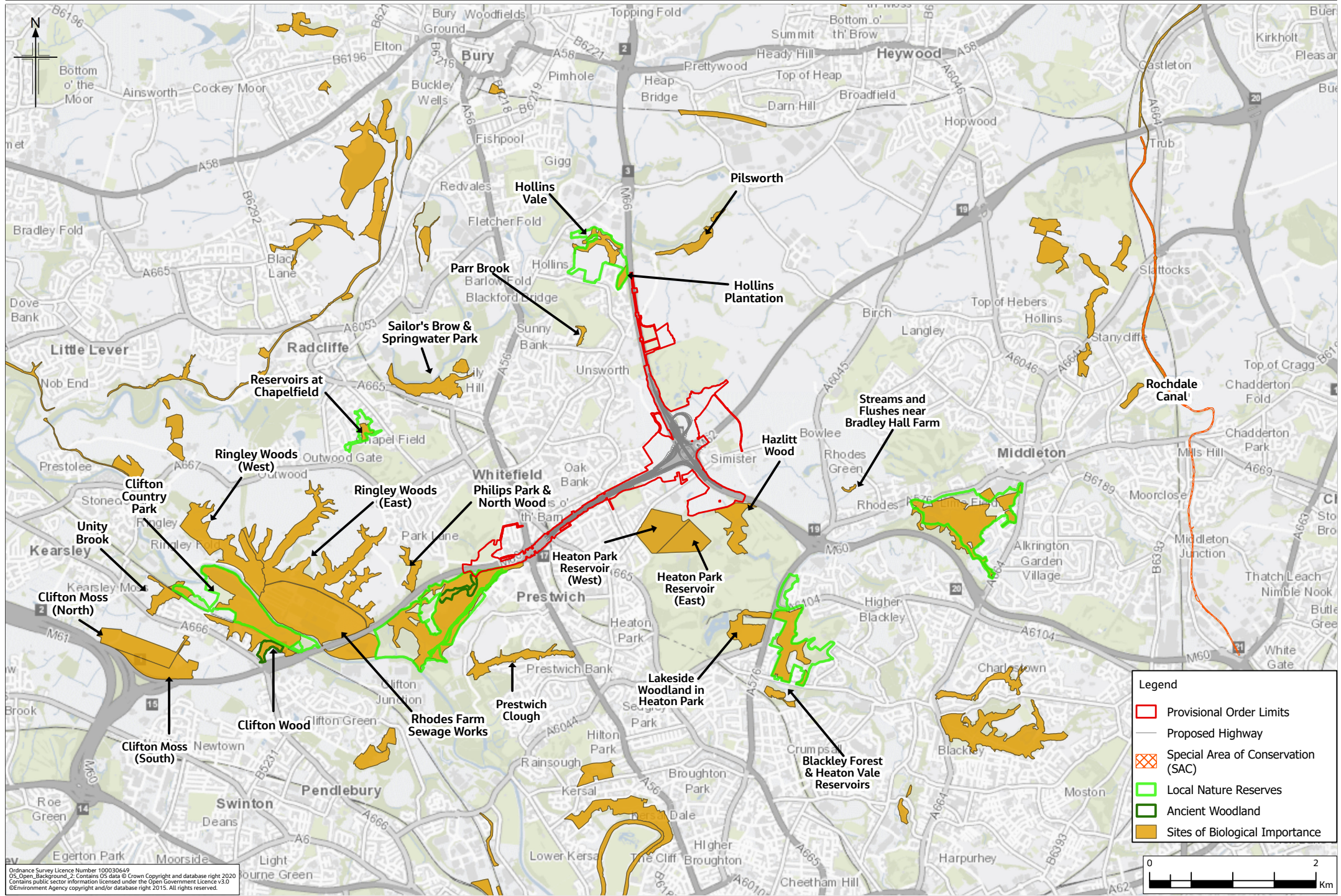
4.4.8 Priority habitats are habitat types that have been identified as being the most threatened and requiring conservation action. Priority habitats and ancient woodland have been considered within a study area of 1km from the provisional Order Limits.

4.4.9 Priority habitats, such as good quality semi-improved grassland, mixed deciduous woodland, lowland fens, traditional orchards, and wood pasture and park, were

identified. There are areas of deciduous woodland (trees that shed their leaves every year) located along the existing motorway verges within the provisional Order Limits.

- 4.4.10 Ancient woodland are areas of woodland that have persisted since 1600. Ancient and veteran trees (veteran trees can be any age, but show 'ancient characteristics' like ancient woodland trees) were also searched for. There are five ancient woodland sites located within 1km of the provisional Order Limits, four of which are located near the network of roads being assessed for changes in air quality.

Designated Ecological Sites



Legend

- Provisional Order Limits
- Proposed Highway
- Special Area of Conservation (SAC)
- Local Nature Reserves
- Ancient Woodland
- Sites of Biological Importance

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Protected and notable species

- 4.4.11 Field surveys and desk-based research have indicated that the area within 2km of the provisional 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 such as the Cinnabar moth.
- 4.4.12 Additional ecology field surveys will be undertaken and the results reported in the upcoming Environmental Statement.

Great crested newt found during a survey



Example of ponds present in the area



Effects during construction

- 4.4.13 Effects on biodiversity during construction include both temporary and permanent impacts, including the loss of areas of some habitats including grassland, woodland, trees, and hedgerows. In addition, there may be impacts on small sections of watercourses through creation of new outfalls.
- 4.4.14 It is proposed that any habitat loss is replaced and enhanced so that there would be an overall beneficial offset and a gain in habitat once planting has matured. There is potential for a significant adverse effect on Philips Park due to the potential loss of a small area of ancient woodland to enable access to the downstream end of the culvert. Ancient woodland is considered to be an irreplaceable habitat. Potential impacts cannot be ruled out at this stage as construction activities would take place close to, though not within, the ancient woodland. The ancient woodland site itself is within the provisional Order Limits as access may be required to implement protection measures for the woodland itself and/or to gain access to the watercourse for water monitoring and silt protection. The extent of Philips Park Ancient Woodland site that is within the provisional Order Limits (0.03ha) represents 0.8% of the ancient woodland site as a whole.
- 4.4.15 At this stage the proposed temporary works detailed above are not anticipated to result in loss or deterioration of ancient woodland habitat. An Arboricultural Impact Assessment is currently being developed for the scheme and will be available for the Environmental Statement. Measures intended to avoid, reduce or prevent impacts to trees and woodland will be outlined in the Environmental Statement.
- 4.4.16 In addition, 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 and common toad. Measures would be put in place to ensure that great crested newts remain in a favourable conservation status through District Level Licensing. District Level Licensing is a 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.
- 4.4.17 With mitigation measures, including those identified above, it is considered that there could be a **significant adverse effect** on Philips Park and **no likely significant adverse effects** on other biodiversity features during construction.

Effects during operation

- 4.4.18 Impacts during operation could include changes to air quality resulting from the deposition of nitrogen from traffic emissions, with the following sites potentially impacted (subject to further assessment):
- Clifton Country Park LNR / SBI / Ancient Woodland site
 - Rhodes Farm Sewage Works SBI
- 4.4.19 During operation impacts could include wildlife death or injury from moving vehicles. Disturbance of wildlife is also a potential impact during operation, however, this would be mitigated through sensitive lighting design and screening through landscape planting. Proposed attenuation ponds would provide water quality treatment from road

runoff (water that runs off roads particularly after rainfall) before reaching receiving watercourses.

- 4.4.20 Preliminary assessment has concluded that effects on biodiversity features are **not likely to be significant** with the application of mitigation measures as described above. Further assessment of potential impacts on the two ecological sites identified in paragraph 4.4.17 will be undertaken and reported in the Environment Statement.

Conclusion

- 4.4.21 Baseline surveys have either been completed or are ongoing within the provisional Order Limits of the scheme and have shown that these areas are used by a number of protected and notable species, including bats, great crested newts, toads, badgers and birds.
- 4.4.22 Construction of the scheme would lead to a small number of impacts, mainly through loss of habitats. Construction activities to install a new culvert would take place close to a small area of ancient woodland in Philips Park. As potential impacts on the ancient woodland cannot be ruled out at this stage, there is potential for **significant adverse effect** on Philips Park. With mitigation measures, such as the replacement and enhancement of any habitat loss as a direct impact of the proposed works, there would be **no likely significant adverse effects** on other biodiversity features during construction.
- 4.4.23 Operation of the scheme would have a number of impacts, particularly with regard to air quality, however it is considered that effects are **not likely to be significant** with the application of mitigation measures. Further assessment on the impact of changes to air quality on ecological sites will be undertaken and reported in the Environmental Statement.

4.5 Geology and soils

Introduction

- 4.5.1 A preliminary geology and soils assessment has been undertaken. The assessment considers the likely significant effects of the scheme on:
- Geology – including bedrock geology (the main layers of rock that form the Earth), superficial deposits ('young' deposits of rocks usually laid on top of the bedrock geology), sites designated for geology, and valuable non-designated geological features
 - Soil resources – mostly agricultural
 - Land contamination – effects on human health, surface water and groundwater

Baseline environment

- 4.5.2 A study area of 250m around the provisional Order Limits has been used to establish baseline conditions and identify potential impacts on geology and soil features. The study area is considered to represent the distance over which contamination can move and where effects on soils or geological features may occur.

4.5.3 Initial ground investigation and agricultural land classification soil surveys have been undertaken. Further investigation will be undertaken due to a change in the provisional Order Limits. Data from this survey will inform the assessment presented in the Environmental Statement but were not yet available for the preliminary geology and soils assessment.

4.5.4 Key geology and soils features are summarised below.

Bedrock geology

4.5.5 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 and peat.

4.5.6 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.

4.5.7 The area around the scheme is dominated by good to moderate quality soils for agricultural land.

4.5.8 There is made ground (land where natural soils have been replaced by man-made materials, for example embankments) along the carriageway and raised ground to the north-east of M60 junction 18. 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

4.5.9 Soils would be affected in two ways during construction, via:

- Physical removal or permanent covering of agricultural land
- Degradation of agricultural land during stripping, handling and storage of soils

4.5.10 A permanent loss of agricultural land associated with the provisional Order Limits would be unavoidable. The degradation and loss of soil resources has been assessed as a **significant adverse effect** during construction.

4.5.11 Contamination can pose a risk to people's health. Made ground, engineered fill and natural soils underlying the provisional Order Limits may have been potentially contaminated by the historical and current land use activities identified along the scheme, including historical landfill sites. However, as significant ground gas or soil contamination is unlikely to be encountered, this potential effect has been scoped out.

4.5.12 Groundwater and surface water may be impacted by the disturbance of potentially contaminated soils and landfill materials within the provisional Order Limits. A ground investigation and baseline groundwater monitoring has been undertaken to assess baseline groundwater quality. This will be reported after the completion of the further ground investigation. In the absence of these data the effects of contamination on surface water and groundwater have been assessed as **significant adverse**.

- 4.5.13 It is considered unlikely that significant ground gas or soil contamination would be encountered during construction works, however as some residential properties are located close to construction working areas there is potential for **significant adverse effects** on human health for nearby residents. This will be reassessed after completion of the additional ground investigation noted in paragraph 4.5.3.
- 4.5.14 An Environmental Management Plan, including a Materials Management Plan for reuse of materials, will be developed before the start of construction works which will detail best practice for using soils on site.
- 4.5.15 A soil resource survey has been undertaken to confirm the finding of the desk study. Until further ground investigation has been completed it is not known whether any remedial work will be required.

Effects during operation

- 4.5.16 There would be **no significant adverse 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.

Conclusion

- 4.5.17 During construction there is potential for **significant adverse effects** on:
- Soils (due to physical removal, permanent covering or degradation)
 - Agricultural land (due to a permanent loss of some agricultural land)
 - Groundwater and surface water quality (due to potential contamination)
 - Health of residents near to construction areas (due to ground gas and soil contamination which may be encountered during construction works)
- 4.5.18 **No significant adverse effects** are expected during operation.
- 4.5.19 The significance of effects described above may change following analysis of information from additional ground investigation. Some effects can be mitigated by the implementation of a Materials Management Plan, Environmental Management Plan and remediation measures, however some significant effects could remain.

4.6 Material assets and waste

Introduction

- 4.6.1 A preliminary assessment of material assets and waste has been undertaken, considering the effects from: the use and consumption of construction materials and products; 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

- 4.6.2 Regional data show 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

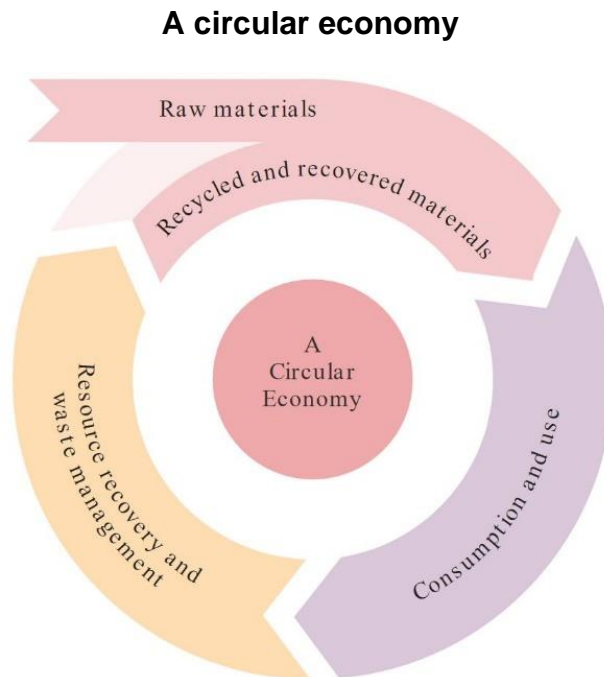
construction including sand, gravel and crushed rock) within the north-west of England to support the construction of the scheme. There is also likely to be available waste management capacity within the region to accommodate the majority of waste likely to arise during construction.

- 4.6.3 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 development which may prevent the existing and potential future extraction and use of the mineral resource – this is known as sterilisation. While some of the scheme extents are also located within known areas of localised peat deposits, these are not classified as peat resources (existing or potential peat extraction sites).

Effects during construction

- 4.6.4 Construction of the scheme would need materials and would generate waste that would need to be managed.
- 4.6.5 The use of primary (or virgin) materials affects their immediate and, in the case of primary aggregates, long-term availability, resulting in direct impacts on the environment through the reduction of limited natural resources. Disposal of waste to landfill would result in direct impacts on the environment through the permanent use of landfill capacity and the loss of material that could potentially be recycled.
- 4.6.6 To construct the scheme we would need to take some land permanently. This would include land take inside the Mineral Safeguarding Areas and Areas of Search. Whilst this could partially constrain or prevent the potential future use of the minerals in these areas, consultation with the Greater Manchester Minerals and Waste Planning Unit and the Coal Authority confirm the scheme is unlikely to significantly sterilise the mineral resource in the study area.
- 4.6.7 Peat deposits are also recorded within the scheme boundary. Consultation with the Greater Manchester Minerals and Waste Planning Unit has confirmed that no sterilisation of peat resources is likely to occur given 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 and locking away carbon dioxide in the ground.
- 4.6.8 Due to its compressible nature however, any peat that is encountered within the footprint of the scheme may need to be excavated and managed as waste if it cannot be built over using conventional construction methods. Any additional impacts to soil resources and climate from the excavation and/or drainage of peat would be separately assessed in the Geology and Soils and Climate chapters of the Environmental Statement.
- 4.6.9 Mitigation measures would be implemented throughout the design and construction of the scheme to reduce the consumption of primary materials, unnecessary sterilisation of safeguarded mineral resources, and disposal of waste to landfill in the region. Where feasible, any surplus materials and wastes would be reused, recycled or otherwise recovered on or off-site.

4.6.10 Maximising reuse and diverting waste away from landfill would reduce the environmental impacts associated with materials production, thereby supporting a circular economy (see **A circular economy** illustration for a visual representation). A circular economy is an alternative to a traditional approach (of make, use, dispose) in which resources are kept in use for as long as possible.



Source: <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england/resources-and-waste-strategy-at-a-glance>

4.6.11 At this preliminary environmental assessment stage, there is limited information available regarding the precise material requirements and waste quantities associated with constructing the scheme. However, it is considered that effects relating to the consumption of material assets and generation and disposal of wastes are likely to be **not significant**. This conclusion will be checked when precise material requirements and waste quantities are known and will be reported in the Environmental Statement.

Effects during operation

4.6.12 No significant maintenance activities would occur during operation, and therefore no significant materials consumption or waste generation is expected. There would be no likely significant effects on material assets and waste during operation.

Conclusion

4.6.13 Effects relating to the consumption of material assets and generation and disposal of wastes have been assessed at this preliminary stage as likely to be **not significant** during construction and operation, after the application of mitigation. This will be checked using material and waste quantities for the scheme when they become available, and the final conclusions reported in the Environmental Statement.

4.7 Noise and vibration

Introduction

4.7.1 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. A preliminary assessment of the construction and operation of the scheme on noise and vibration has been undertaken.

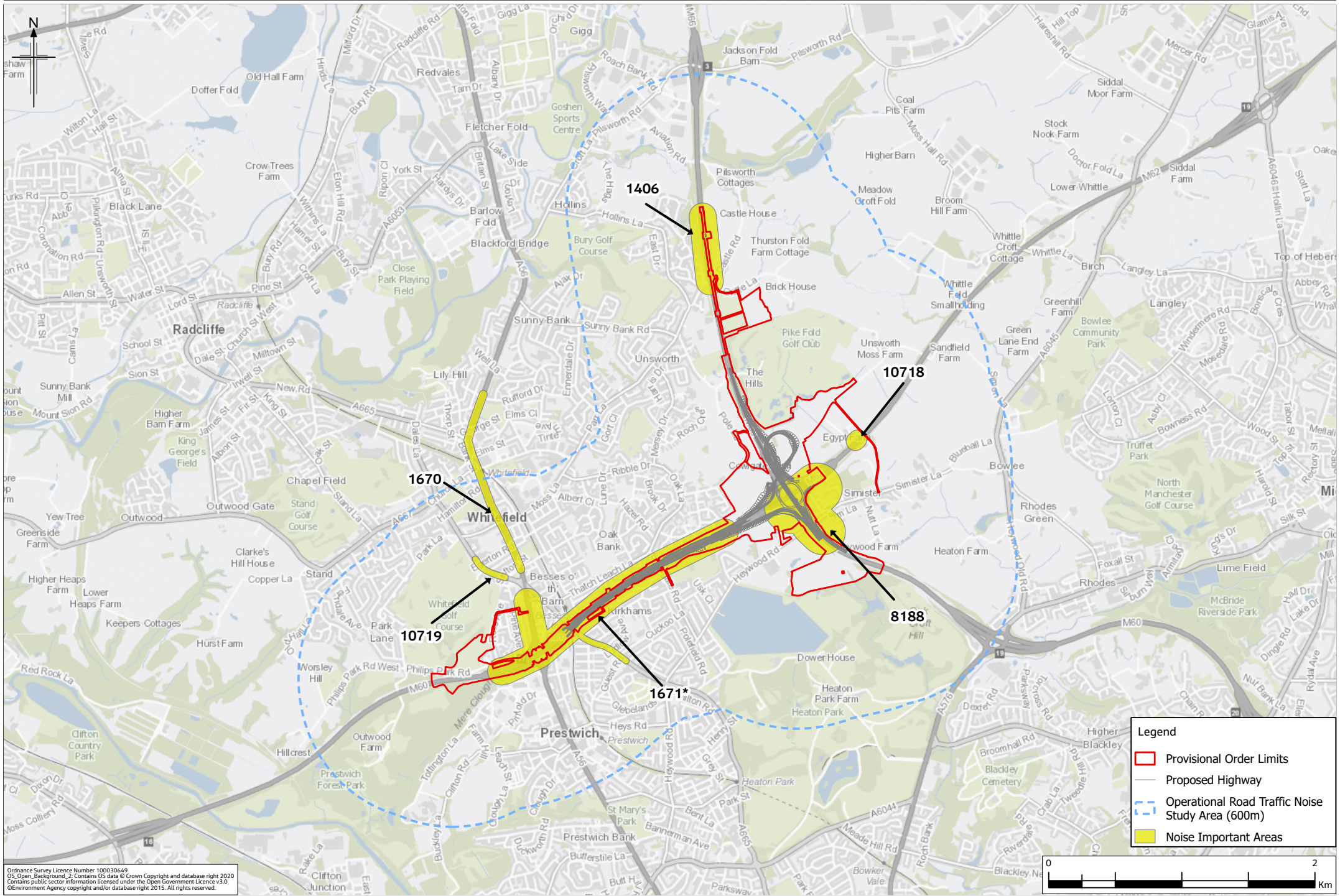
Baseline environment

4.7.2 The study areas for the preliminary assessment of noise and vibration 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 300m from construction activity
- **Construction vibration** – receptors up to 100m from any activity likely to generate a noticeable level of vibration
- **Operational road traffic noise** – receptors up to 600m from new road links or roads physically changed or bypassed by the scheme, and receptors within 50m of other road links that may experience a short-term change in noise levels of 1.0 decibel or more

4.7.3 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 600m of the scheme. Noise Important Areas are areas that have been identified as experiencing particularly high road traffic noise levels. Three of the Noise Important Areas are directly adjacent to the scheme, and the remaining three are located adjacent to the local road network.

Noise Important Areas



Legend

- Provisional Order Limits
- Proposed Highway
- Operational Road Traffic Noise Study Area (600m)
- Noise Important Areas

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- 4.7.4 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 junction 18, 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 16 education facilities.
- 4.7.5 The realignment of the M60 between junctions 17 and 18 would bring traffic slightly closer to some noise sensitive features. There would also be road traffic noise increases from the introduction of new sections of road including the Northern Loop.
- 4.7.6 However, levels of noise are expected to reduce along the northern and eastern sections of the M60 junction 18 roundabout as a result of diverting road traffic away from these sections and onto the Northern Loop instead.
- 4.7.7 Noise measurement surveys have been undertaken in Autumn 2021 and the results are reported within the PEIR (see **Typical noise monitoring equipment** photograph for an example of the noise monitoring equipment we use).

Typical noise monitoring equipment



Effects during construction

- 4.7.8 We have carried out an assessment of likely noise and vibration effects, based on a preliminary construction methodology. This will be reviewed and updated against the refined construction methodology at the Environmental Statement stage.
- 4.7.9 Construction activities can cause adverse noise effects due to the overall noise level and the time 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 demolition 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, such as bridge replacement or gantry (overhead signs) installation, may need to be carried out during off-peak working hours such as nights, evenings and weekends, which could generate adverse effects due to an increase in noise during these hours.

- 4.7.10 Possible **significant adverse effects** for noise have been identified during some phases of works including the activities of site clearance, earthworks, drainage works, roadworks, gantry works, retaining walls, piling for piers and construction of some of the attenuation ponds. The significance of these effects will be re-assessed in the Environmental Statement, based on a construction methodology and programme that has been further developed.
- 4.7.11 **No potential significant effects** have been identified for vibration from construction activities. This will be checked and reconfirmed at the Environmental Statement stage.
- 4.7.12 Well established measures to reduce the noise from construction activities would be included in an Environmental Management Plan and incorporated into the working practices. 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. We would keep nearby residents 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.

Effects during operation

- 4.7.13 At this preliminary environmental assessment stage, potential traffic noise impacts have been assessed for the year the scheme is due to open. For the Environmental Statement we will also examine potential long-term effects and effects at night.
- 4.7.14 When the roads open for traffic (called scheme opening) there are predicted to be increases in road traffic noise of over three decibels along the M60 eastbound (i.e. its northern side), due to an expected increase in traffic flow and speed. These road sections are within a Noise Important Area and have existing noise barriers. Given there is already high noise exposure in this area, the road traffic noise increases may result in **significant adverse effects** for some receptors on scheme opening.
- 4.7.15 In locations where the scheme moves road traffic away from current routes to new road sections at M60 junction 18 some localised decreases in road traffic noise have been predicted. However, these are all below three decibels and are not considered to provide any significant beneficial effects.
- 4.7.16 The introduction of the new road sections that make up the Northern Loop do not result in increased road traffic noise levels for the closest receptors on Marston Close and Cowlgate Farm on Pole Lane.
- 4.7.17 To reduce the predicted increases in noise, the inclusion of additional noise barriers or increasing the height of existing noise barriers will be considered for the Environmental Statement. The use of very low noise surfacing for the scheme will also be investigated.

Conclusion

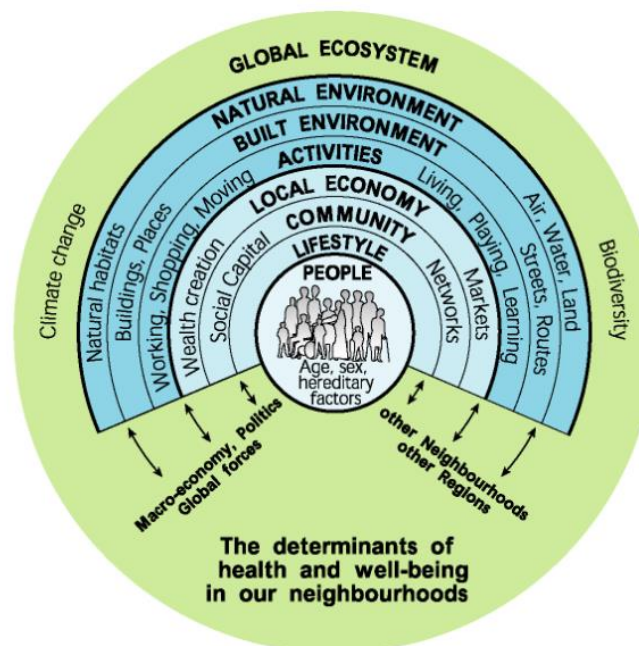
- 4.7.18 The evaluation of construction phase effects has identified potential **significant adverse effects** for noise for some receptors due to an increase in noise during some construction activities. No potential significant effects have been identified for vibration from construction activities.
- 4.7.19 The preliminary assessment of operational road traffic noise has identified **significant adverse effects** for some receptors near to the M60 eastbound. There will also be some non-significant reductions in road traffic noise for some receptors.

4.8 Population and human health

Introduction

- 4.8.1 This chapter provides a preliminary assessment of the interrelated aspects of population and human health and considers 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 **Wider determinants of health in our natural and built environment** illustration).

Wider determinants of health in our natural and built environment



Source: Barton and Grant (2006)

Baseline environment

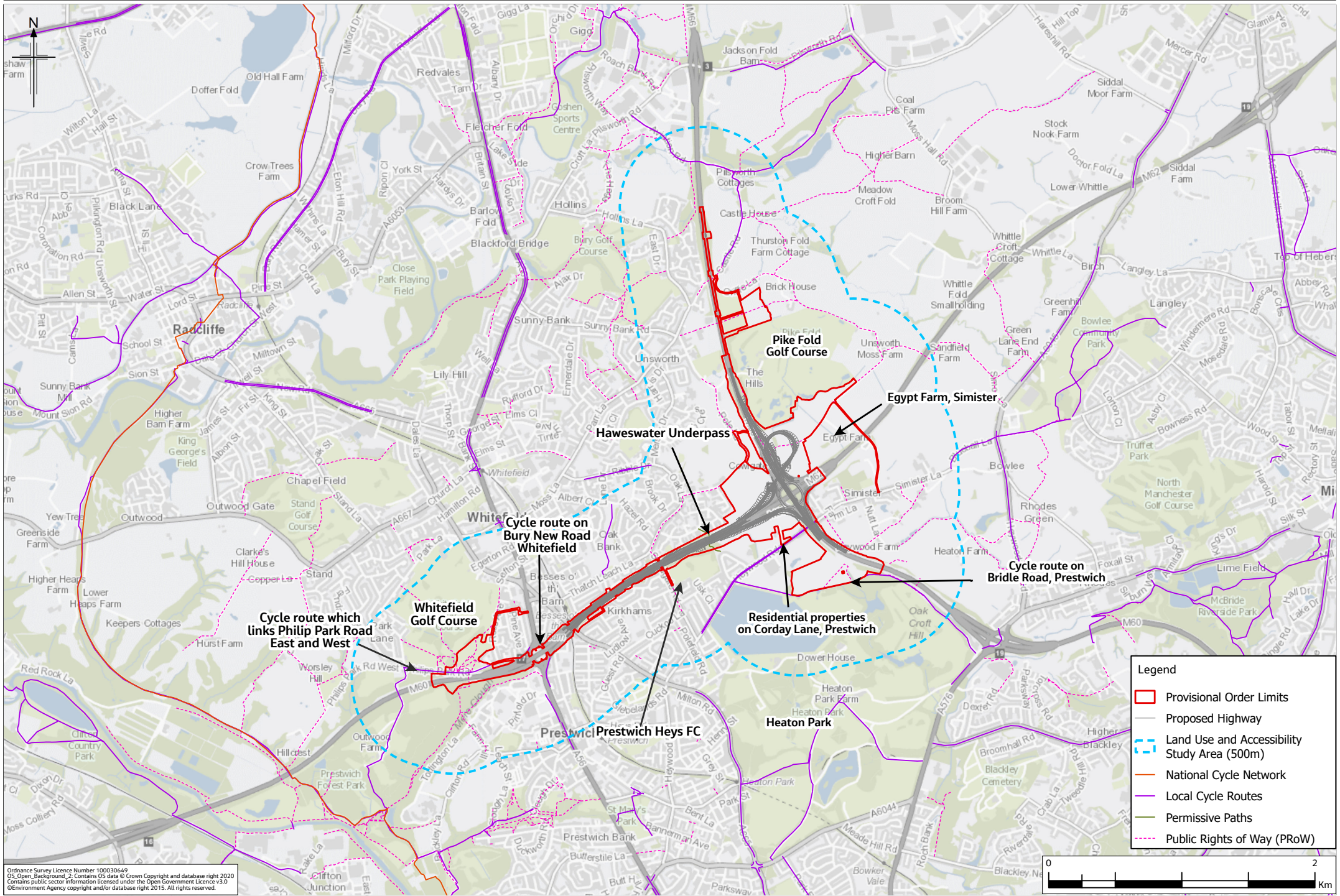
Land use and accessibility

- 4.8.2 Key settlements within the study area include Whitefield, Prestwich, Unsworth and Simister. These areas contain numerous community facilities and businesses of all

types, with those nearest to the scheme including Whitefield Golf Course, Philips Park/Prestwich Forest Park and Pike Fold Golf Club. Residential dwellings border the M60 between junctions 17 and 18 and the east of the M66 north of M60 junction 18. 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 junction 18 and west of the M66.

- 4.8.3 There is an extensive public right of way network within the study area. There are also Transport for Greater Manchester cycle routes within the provisional Order Limits, as well as footways, lanes and permissive routes (these are routes on private land that the landowner has given permission for people to use) used by walkers, cyclists and horse-riders. There are a total of ten routes that can be used by walkers, cyclists and in some cases horse riders to cross the M60, M66 and M62 within the provisional Order Limits, of which five are public rights of way (the other routes being four lanes, Haweswater Underpass and Prestwich Footbridge). Further routes including public rights of way are located within the provisional Order Limits where elements of the scheme are proposed such as for construction of haul routes, compounds and soil storage areas, drainage ponds and the Northern Loop.

Public Rights of Way, Cycle Routes and Permissive Paths



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4.8.4 Large areas of land bordering the M60 junction 18 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).

Human health

4.8.5 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.

4.8.6 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

Land use and accessibility

4.8.7 During construction there would be:

- **Temporary disruption to access to:**
 - Residential properties on Corday Lane (Prestwich) and Egypt Farm (Simister) and along Beech Avenue, Oak Avenue, Ross Avenue, Kenilworth Avenue and Warwick Close (Whitefield)
 - Prestwich Heys Football Club grounds and the adjacent recreational area
 - Public rights of way within land south of Whitefield Golf Course and eight other public rights of way located elsewhere in the provisional Order Limits
 - The section of footpath located north-east of M60 junction 18 which links Egypt Lane, Simister and Pike Fold Golf Club. This footpath would be closed for a period of up to three years
 - The Transport for Greater Manchester cycle route which links Philips Park Road East and West. This cycle route could be closed for a period of up to 12 months meaning cyclists and pedestrians would have to divert
 - A permissive path which links Derwent Avenue to Parrenthorn Road via Haweswater Underpass
- **Temporary land** required from community assets including land south of Whitefield Golf Club, Philips Park/Prestwich Forest Park, Pike Fold Golf Club and Unsworth Academy playing fields, a small number of residential properties (such as parts of garden or drives) and some agricultural landholdings (where permanent land take is also required, see below)
- **Permanent land** required from two areas allocated for housing adjacent to M60 junction 18, a small number of residential properties (such as parts of garden or drives) and from eight agricultural land holdings

- 4.8.8 Effects on residential property and housing and development land are assessed as **not significant** (neutral or slight adverse effects), subject to essential mitigation. Essential mitigation includes measures such as engagement with landowners or developers and full reinstatement of land acquired on a temporary basis.
- 4.8.9 There would be **likely significant adverse effects** on two community land use assets (land south of Whitefield Golf Club and Unsworth Academy playing fields) during the construction phase but with essential mitigation there would be no permanent significant effects following construction.
- 4.8.10 There would be **likely significant adverse effects** during the construction phase on six routes used by walkers or walkers and cyclists due to temporary disruption of access or closures during construction. Effects on other routes used by walkers, cyclists and horse-riders are assessed as **not significant**. Mitigation includes signed diversions for routes used by walkers, cyclists and horse riders. No permanent significant effects are anticipated following construction as connectivity for walking and cycling routes would be restored.
- 4.8.11 There would be **likely significant adverse effects** on four agricultural landholdings due to temporary and permanent land requirements. Effects on five other agricultural landholdings would be **not significant**.

Human health

- 4.8.12 There would be negative impacts on the following wider determinants of health during construction:
- Access to the natural environment and outdoor recreation, accessibility for walking and cycling and community severance due to impacts associated with the disruption to access along routes used by walkers, cyclists and horse-riders and areas of outdoor recreation as described above
 - Quality of urban and natural environments (including air pollution and noise) – impacts associated with temporary noise and dust emissions during construction activities
- 4.8.13 However, the effects on human health from these impacts on wider determinants is judged to be **not significant** due to the short-term nature of the impacts and limited proportion of the community affected.
- 4.8.14 Opportunities to keep the Transport for Greater Manchester cycle route, which connects Philips Park Road East and West, open throughout construction are currently being explored in order to reduce the potential significant adverse effects identified above.

Effects during operation

Land use and accessibility

- 4.8.15 While sections of some footpaths, including within Whitefield Golf Course, will likely be permanently realigned or closed to accommodate new attenuation ponds, there is an opportunity to improve the recreational amenity of the area with a circular route which is being explored as part of design development. There is also an opportunity to improve the footpath that runs along Egypt Lane through rerouting. Other routes would be

restored following construction. Overall, there would be a **neutral effect** on walkers, cyclists and horse riders.

- 4.8.16 **No significant effects** on residential property and housing, development land and community assets are anticipated. No further impacts on agricultural land holdings are predicted over and above the permanent effects on four landholdings predicted for the construction.

Human health

- 4.8.17 Effects during operation on all wider determinants of health scoped into the preliminary assessment are assessed as neutral, with the exception of the quality of urban and natural environments (including air pollution and noise) for which health outcomes are uncertain at this stage as information is being gathered in order to produce a calculation-based assessment (see the **Noise and vibration** and **Air quality** sections of this Non-Technical Summary).

Conclusion

Land use and accessibility

- 4.8.18 **Significant** effects on land use and accessibility would mainly occur during the construction stage. Effects on private property and housing, development land and business, community land and assets and walkers, cyclists and horse riders would be **not significant** during operation.
- 4.8.19 The permanent loss of some agricultural land to the footprint of the scheme would remain a **significant** residual effect in the long term.

Human health

- 4.8.20 Residual effects on health from impacts to five wider determinants of health are assessed as **negative (not significant)** during construction:
- Access to the natural environment and outdoor recreation
 - Accessibility for walking and cycling
 - Community severance
 - Connections to employment, services, facilities and leisure
 - Quality of urban and natural environments (including air pollution and noise)
- 4.8.21 Residual effects on all determinants of health are assessed as neutral during operation, with the exception of quality of urban and natural environments (including air pollution and noise) for which a combination of **negative and positive** effects are anticipated but these would be **not significant** in terms of overall population health. Further assessment will be undertaken and reported in the upcoming Environmental Statement.

4.9 Road drainage and the water environment

Introduction

- 4.9.1 A preliminary assessment of the scheme's interaction and impact on the water environment has been undertaken. The assessment considers impacts on surface water (water quality, water resources, and hydromorphology (the form of rivers)), groundwater (water stored below the ground within layers of rocks and other geology), drainage, and flood risk. The preliminary assessment also considers the scheme's compliance with the Water Environment (Water Framework Directive) Regulations.
- 4.9.2 We have prepared a number of technical reports to support the water environment assessment for the PEIR, the results of these reports are summarised in PEIR Chapter 14: Road Drainage and the Water Environment. These technical reports are:
- A preliminary Water Framework Directive (WFD) Regulations Assessment – this report assesses compliance of the scheme against objectives in the Regulations
 - A preliminary Flood Risk Assessment – this report assesses the risk of flooding to and from the scheme from all sources. The assessment also considers the predicted impact of climate change on flood risk in accordance with national planning requirements
 - A preliminary Water Quality Assessment Report – this report documents the water quality assessments that have been undertaken and presents the results of impacts upon water quality during operation of the scheme
 - A Groundwater Dependent Terrestrial Ecosystem (GWDTE) Assessment Report – this report identifies habitats on land that depend on groundwater and potential impacts upon those habitats
- 4.9.3 The design of the scheme includes a number of mitigation measures to reduce the scheme's effects on the water environment, including:
- Attenuation ponds to store and treat water that will run off the road surface before discharging into watercourses
 - Designing outfalls to minimise impact to watercourses
 - Sizing of new culverts (a structure such as a pipe that transports water from one place to another) not to increase flood risk

Baseline environment

- 4.9.4 The study area for the assessments vary depending upon water environment features and the potential extent of impacts. The study areas are 250m for groundwater-dependent habitats, 500m for hydromorphology, 1km for surface water and flood risk, and 2km for groundwater.

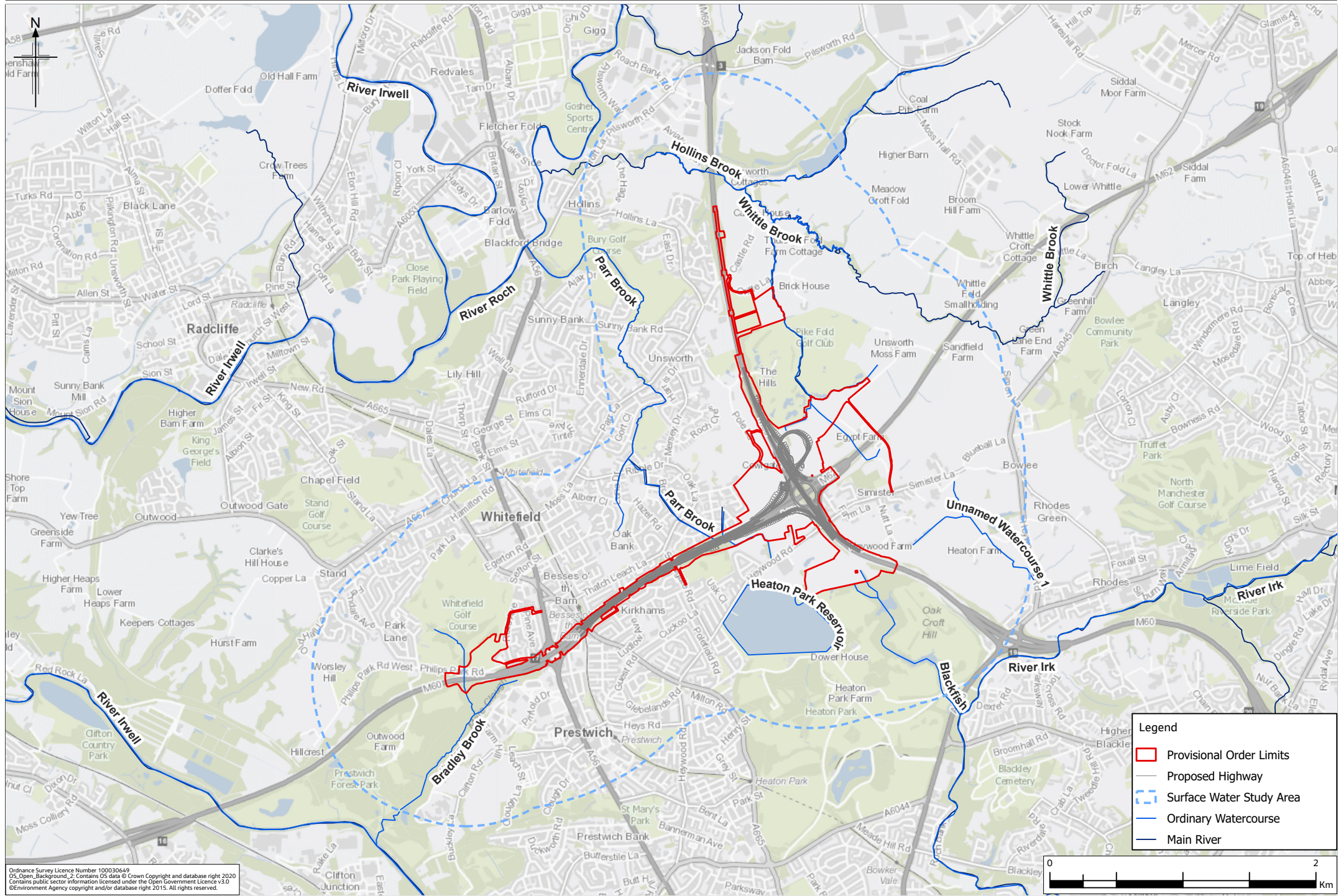
Surface water quality

- 4.9.5 The scheme crosses two watercourses, Bradley Brook and the headwaters of Parr Brook, both of which pass in culvert under the M60 west of junction 18. Both watercourses receive road runoff from the scheme as well as the River Irk, Castle Brook and a tributary (a stream or river that flows into a larger stream or river).

Hydromorphology

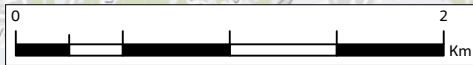
- 4.9.6 There are a number of watercourses and numerous ponds and lakes within the hydromorphology study area (see the **Watercourses** figure). The watercourses are largely straightened channels or, in the case of Parr Brook, extensively culverted. All of these channels are modified (i.e. not in their natural state) and used for drainage.

Watercourses



Legend

- Provisional Order Limits
- Proposed Highway
- Surface Water Study Area
- Ordinary Watercourse
- Main River



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Groundwater

- 4.9.7 There are aquifers (bodies of rock or sediment that hold water) within the study area that support local water supplies. There are no licensed groundwater abstractions (the process of taking water from a groundwater source) used for drinking water supply, however there are seven licensed groundwater abstractions used for industrial/commercial purposes (the closest lies 265m east of the scheme). The majority of the scheme lies on aquifers classified as having a medium-high or medium vulnerability to contamination.
- 4.9.8 Local groundwater may be connected (either directly or indirectly) to watercourses and spring discharges (where water from below ground rises to the surface). There are three locally designated ecological sites within 250m from the provisional Order Limits with habitats that are potentially dependent on groundwater.
- 4.9.9 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 junctions 18 and 19 (see the **Geology and soils** aspect section for further information).

Flood risk

- 4.9.10 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 (low risk of flooding from rivers, with less than 0.1% chance of flooding in any one year). However, there are localised areas in Flood Zone 2 (0.1% – 1% chance of flooding in any one year) and Flood Zone 3 (greater than 1% chance of flooding in any one year).
- 4.9.11 There are numerous areas of surface water flood risk within the study area.
- 4.9.12 There are three main areas within the provisional 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

- 4.9.13 We would mitigate effects on flood risk, water quality, hydromorphology and groundwater during construction by following good construction practice, such as pollution prevention guidelines, and locating construction activities outside of areas at risk of flooding, which would prevent any likely significant adverse effects. This would be delivered through the implementation of an Environmental Management Plan.

Surface water quality

- 4.9.14 The key likely impacts during construction of the scheme for water quality are from the transport of sediment and the use of polluting substances. If released into the environment these can cause water pollution. However, application of mitigation measures and best practice methods would likely reduce these impacts to negligible. Therefore, there would be **no likely significant adverse effects** during construction for the surface water quality aspect.

Hydromorphology

- 4.9.15 Construction activities, for example activities to excavate and clear vegetation for the temporary culvert and outfalls, could lead to temporary and localised impacts on local river and stream beds. Subject to the implementation of mitigation measures, there would be **no likely significant adverse effects** during construction for the hydromorphology aspect.

Groundwater

- 4.9.16 Construction activities could lead to groundwater contamination and disturbances to groundwater flows and levels. For certain groundwater receptors, including the springs and groundwater-dependant habitats that are located within or close to the provisional Order Limits, these impacts could be direct and lead to **significant adverse effects**.
- 4.9.17 Works to construct an attenuation pond in an area to the south of M60 junction 18 at the location of a historic landfill could lead to potentially contaminated water escaping, resulting in **significant adverse effects** on the groundwater quality of the underlying aquifer.
- 4.9.18 The preliminary assessment will be updated for the upcoming Environmental Statement to take into account new information, including data from ground investigations and site walkover surveys. The significance of effects identified above may change following analysis of these data.

Flood risk

- 4.9.19 The risk of surface water flooding during construction is most likely to arise from heavy rainfall when runoff may potentially flood working areas and excavations. With mitigation measures, there would be **no likely significant adverse effects** from construction activities on most sources of flood risk, excluding groundwater flood risk. Changes to permanent below ground structures (such as the installation of road foundations or removal of a gantry) could change groundwater flood risk, with the potential for localised **significant adverse effects** for receptors next to and above the permanent below ground structures.

Effects during operation

Surface water quality

- 4.9.20 The scheme includes a number of attenuation ponds to store and treat water that would run off from the road surface before being released into watercourses. Some discharges of runoff via proposed drainage outfalls could have impacts on water quality in the short-term for the watercourses they go into, however there would be **no likely significant adverse effect**.

Hydromorphology

- 4.9.21 There would be **no likely significant adverse effects** on the hydromorphology of watercourses during the operational phase.

Groundwater

- 4.9.22 With mitigation measures, there would be **no likely significant adverse effects** during operation for most groundwater receptors. There is potential, however, for **significant adverse effects** to remain to two springs located within the provisional Order Limits. Long-term changes in groundwater flow could occur due to new/changes to permanent below ground structures (including additional road foundations and removal of a gantry) and the new embankment for the Northern Loop.

Flood risk

- 4.9.23 There would be **no likely significant adverse effects** on most sources of flood risk during operation, except for groundwater flood risk. There is potential for the scheme to increase groundwater flood risk, both to the development and elsewhere, resulting in a potential **significant adverse effect** during operation due to long-term changes in groundwater levels and flow.

Conclusion

- 4.9.24 During construction of the scheme there is potential for **significant adverse effects** relating to changes in groundwater quality, groundwater flow and groundwater flood risk. There would be **no likely significant adverse effects** on surface water, hydromorphology, and flood risk (excluding groundwater flood risk).
- 4.9.25 During operation of the scheme there is potential for **significant adverse effects** relating to changes in groundwater flow and groundwater flood risk.
- 4.9.26 The preliminary assessment will be updated for the upcoming Environmental Statement to take into account new information, including data from ground investigations. The significance of effects identified above may change following analysis of these data. In addition, mitigation measures are being explored to reduce the significance of effects identified above.

4.10 Climate

Introduction

- 4.10.1 Major road schemes can lead to an increase in greenhouse gas emissions resulting from an increase in road users and the use of materials to construct and maintain infrastructure. We have carried out a preliminary assessment of the potential impact of the scheme on climate by estimating resulting changes in greenhouse gas emissions. We have also undertaken a preliminary assessment of the potential vulnerability of the scheme to possible future changes in climate (such as changes in temperature and rainfall patterns).

Baseline environment

Greenhouse gas emissions

- 4.10.2 At this stage, only greenhouse gas emissions resulting from operational road users (i.e. emissions associated with the consumption of fuel and electricity by vehicles) have

been estimated, the study area for which comprises a large extent of the road network included within the traffic model developed for the scheme.

- 4.10.3 We have compared the estimated greenhouse gas emissions against the UK carbon budgets. The UK carbon budget, agreed by the UK Government, restricts the total amount of greenhouse gases the UK can emit over a 5-year period in order to meet the UK's commitments to reduce emissions and achieve net zero carbon (meaning no more greenhouse gas is emitted into the atmosphere than is taken away).

Vulnerability to changes in climate

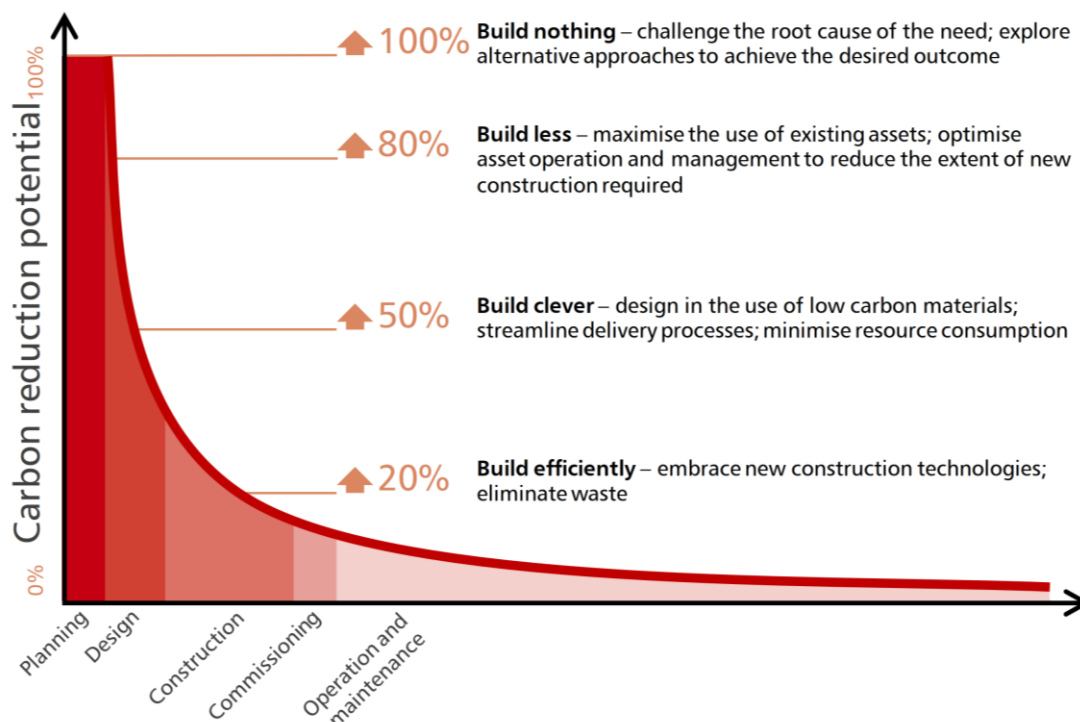
- 4.10.4 The study area for the scheme's vulnerability to climate comprises the construction footprint of the scheme, including compounds and temporary land required. Features relevant to the scheme that are potentially vulnerable to climate change include elements of the scheme itself, such as pavements, structures, earthworks, drainage and technology, and operational road users, including the public and commercial operators, who may be affected by disruption.

Effects during construction

Greenhouse gas emissions

- 4.10.5 As part of the process for calculating greenhouse gas emissions associated with construction of the scheme, we have established processes to review these throughout the design process, thereby informing and identifying opportunities to reduce such emissions. This includes exploring opportunities to build less or more efficiently. The illustration **Carbon reduction curve** shows how this process can reduce carbon emissions.

Carbon reduction curve



Source: <https://www.gov.uk/government/publications/infrastructure-carbon-review>

- 4.10.6 Construction phase greenhouse gas emissions have not been quantified for the preliminary assessment but will be estimated and reported in the upcoming Environmental Statement.
- 4.10.7 The magnitude of construction phase greenhouse gas emissions, particularly following the implementation of mitigation measures to avoid or reduce greenhouse gas emissions, is considered likely to be negligible in comparison to relevant UK carbon budgets. On this basis, construction phase greenhouse gas emissions are considered unlikely to have a material impact on the ability of the UK Government to meet its carbon reduction targets and are therefore **not likely to be significant**.

Vulnerability to changes in climate

- 4.10.8 Climate change related impacts are considered **not likely to be significant** during the construction phase following the application of standard 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

Greenhouse gas emissions

- 4.10.9 At this preliminary environmental assessment stage, we have only considered greenhouse gas emissions associated with operational road users (i.e. emissions associated with the consumption of fuel and electricity by vehicles).

4.10.10 For the upcoming Environmental Statement, we will also consider emissions associated with maintaining and operating the scheme (i.e. emissions associated with materials used during maintenance activities, including repair and replacement of scheme assets, and electricity consumption for operational needs such as signage and lighting) and changes in land use.

4.10.11 Preliminary estimates of operational road user greenhouse gas emissions indicate that changes in greenhouse gas emissions as a result of the scheme are negligible in comparison to relevant UK carbon budgets. On this basis, operational phase greenhouse gas emissions are considered unlikely to have a material impact on the ability of the UK Government to meet its carbon reduction targets and are therefore **not likely to be significant**.

Vulnerability to changes in climate

4.10.12 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
- Increased summer temperatures and heatwaves/hot spells

4.10.13 We will choose materials that comply with relevant highways design standards, guidance and good engineering practice. Additionally, the design will incorporate suitable climate change allowances in accordance with relevant Environment Agency guidance (for example, in relation to the sizing and capacity of the drainage systems).

4.10.14 These mitigation measures, coupled with appropriate asset management during operation including monitoring and inspections, would adequately address the potential climate change hazards identified above. As a result, it is considered that the potential climate-related hazards identified **would not result in a significant effect** during the operational phase.

Conclusion

4.10.15 Following the implementation of suitable mitigation measures, the scheme is considered **unlikely to have a significant effect** on climate, and it is considered that there would be **no significant effect** on the scheme's vulnerability to possible future changes in climate.

4.10.16 A full assessment of greenhouse gas emission and the scheme's vulnerability to changes in climate will be undertaken and reported in the upcoming Environmental Statement.

4.11 Cumulative effects assessment

4.11.1 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. The PEIR presents a 'long list' of other development projects that will be considered in the

cumulative effects assessment. Other developments considered in the 'long list' include a major mixed-use development of up to 1,000 residential dwellings and employment land at South Heywood, the Manchester North West Quadrant scheme, and sites allocated for residential development in close proximity to the scheme. The 'long list' was screened and reduced to a 'shortlist' of other development projects which will be taken forward for further assessment. The long list and short list will be reviewed and updated during the Environmental Impact Assessment and the findings of the cumulative effects assessment will be presented in the Environmental Statement.

4.12 Summary of the preliminary environmental assessment

4.12.1 The table below provides a summary of the potential residual significant environmental effects associated with the construction and operation of the scheme. We have developed mitigation measures for this preliminary assessment to avoid or reduce environmental effects where possible. We have considered these mitigation measures when determining the significance of effects.

4.12.2 The conclusions presented in the **Summary of the preliminary environmental assessment** table are preliminary and subject to the ongoing Environmental Impact Assessment process, which includes further surveys and studies and the development of mitigation. The final results of the environmental assessment will be reported in the upcoming Environmental Statement.

Summary of the preliminary environmental assessment

Green = no significant effects. Pink = potential significant effects

Aspect	Summary of significant residual environmental effects	
	Construction	Operation
Air quality	No likely significant effects identified.	No likely significant effects identified. Potential for significant adverse effects on biodiversity sites from nitrogen deposition will be assessed by the biodiversity specialist in the Environmental Statement.
Cultural heritage	No likely significant effects identified.	No likely significant effects identified.
Landscape and visual	Likely significant adverse effects on landscape character and townscape character 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 in some locations due to construction activities including those noted above.	During the opening year significant adverse effects on landscape and townscape character and townscape character are likely due to a permanent increase in the extent of highway infrastructure, including the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge, and night-time lighting required on the new infrastructure, and changes in land use and field pattern. During the opening year significant adverse effect on views for some people are likely in close proximity to the scheme and where the Northern Loop, Simister Pike Fold Viaduct and Simister Pike Fold Bridge, and the widening of the mainline remains prominent in the view. The effects on landscape character and people's views would reduce to non-

Aspect	Summary of significant residual environmental effects	
	Construction	Operation
		significant 15 years after the opening of the scheme, due to the growth of mitigation planting which would screen views or reduce the prominence of the scheme and provide integration of new infrastructure.
Biodiversity	Potential for significant adverse effect on Philips Park due to the potential for impacts on a small area of ancient woodland (due to construction works taking place close to the ancient woodland).	No likely significant effects identified.
Geology and soils	Potential for significant adverse effects on: <ul style="list-style-type: none"> • Soils (due to physical removal, permanent covering or degradation) • Agricultural land (due to a permanent loss of some agricultural land) • Groundwater and surface water quality (due to potential contamination) • Health of residents near to construction areas (due to ground gas and soil contamination which may be encountered during construction works) 	No likely significant effects identified.
Material assets and waste	No likely significant effects identified.	No likely significant effects identified.
Noise and vibration	Potential significant adverse effects for noise at some locations due to an increase in noise during some construction activities. No potential significant effects have been identified for vibration from construction activities.	Potential significant adverse effects for some residents near to the M60 eastbound. There will also be some non-significant reductions in road traffic noise at some locations.
Population and human health	Likely significant adverse effects on two community land assets, five agricultural land holdings and four routes used by walkers or walkers and cyclists during construction.	No likely significant effects identified.
Road drainage and the water environment	Potential for significant adverse effects relating to changes in groundwater quality, groundwater flow and groundwater flood risk. There would be no likely significant adverse effects on surface water, hydromorphology, and flood risk (excluding groundwater flood risk).	Potential for significant adverse effects relating to changes in groundwater flow and groundwater flood risk.
Climate	No likely significant effects identified.	No likely significant effects identified.
Cumulative effects	Cumulative effects will be assessed and reported within the Environmental Statement.	

5. Consultation and next steps

5.1 Consultation

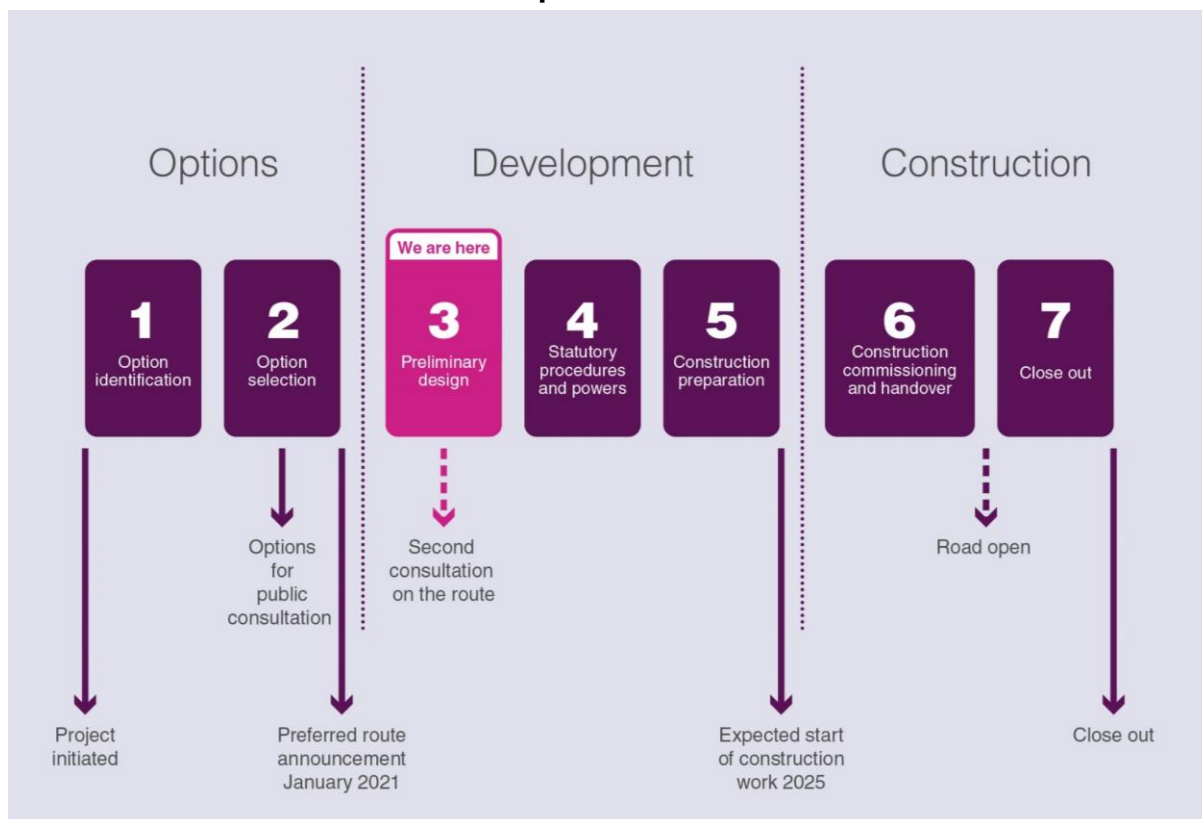
- 5.1.1 We are currently holding a public consultation, and this PEIR non-technical summary forms part of the consultation package. Please share any ideas, local knowledge or concerns that you may have. The consultation will run for six weeks from 15 February to 28 March 2023.
- 5.1.2 Further information on the consultation can be found on our webpage at www.nationalhighways.co.uk/M60-Simister-Island. All the consultation materials will be digitally available, including:
- The consultation brochure
 - A digital flythrough of the scheme
 - Other technical information (including the PEIR) which you will be able to download
- 5.1.3 You can also take away copies of the brochure and view additional materials at public information points as detailed in the consultation brochure. Please contact our project team at M60J18SimisterIslandInterchange@nationalhighways.co.uk or phone our Customer Contact Centre at 0300 123 5000 to request an accessible format of the brochure.
- 5.1.4 You can share your views, concerns and suggestions using one of the following methods:
- **Online:** complete the consultation response form at: www.nationalhighways.co.uk/M60-Simister-Island
 - **Post:** complete a paper copy of the consultation response form available from the public information points (as listed in the consultation brochure), or at the public events and return the form using the freepost address: FREEPOST M60 J18 SIMISTER ISLAND
 - **Email:** M60J18SimisterIslandInterchange@nationalhighways.co.uk
- 5.1.5 All responses should be returned by 11.59pm on Tuesday 28 March 2023.

5.2 Next steps

- 5.2.1 Once the consultation closes, we will review all the suggestions and comments received. We will take time to analyse and consider your feedback when making further refinements to the proposed design and developing our planned mitigation measures. We will set out a summary of the responses and describe how our proposals have been informed and influenced by them in a consultation report. This will form part of our application for development consent and will also be available to the public following submission of the application.
- 5.2.2 We expect to submit our application in 2023 and, provided consent is granted, construction work is expected to start in 2025.
- 5.2.3 Once we submit our application, the Planning Inspectorate (acting on behalf of the Secretary of State) will examine the application and may hold some public hearings,

before making a recommendation to the Secretary of State for Transport, who will decide on whether or not the scheme will go ahead. The process for the next steps for the scheme is shown below.

Next steps for the scheme



5.3 How to find out more

5.3.1 For more information, please visit our project webpage (www.nationalhighways.co.uk/M60-Simister-Island) where you can also sign up for email alerts whenever the webpage for the scheme is updated. If you have any queries about this scheme, please contact us by calling 0300 123 5000 or emailing the project team at [mailto: M60J18SimisterIslandInterchange@nationalhighways.co.uk](mailto:M60J18SimisterIslandInterchange@nationalhighways.co.uk).

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