

M60/M62/M66 Simister Island Interchange

TR010064

ENVIRONMENTAL STATEMENT CHAPTER 2 THE SCHEME

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**M60/M62/M66 Simister Island Interchange
Development Consent Order 202[]**

**ENVIRONMENTAL STATEMENT
CHAPTER 2 THE SCHEME**

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2 The Scheme

2.1 Need for the Scheme

- 2.1.1 M60 J18 provides the interchange between the M60, M62 and M66 motorways to the north of Manchester, and was identified within the Route Based Strategy Evidence Report (Highways Agency, 2014) as a key junction capacity issue on the strategic road network (SRN).
- 2.1.2 M60 J18 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.
- 2.1.3 The M60, M62 and M66 motorways connect important economic areas within Greater Manchester and Lancashire, and also facilitate a connection to Leeds, another important economic area. M60 J18 links the Greater Manchester orbital motorway with Rossendale and Burnley to the north, and Rochdale and Leeds to the east. There are several significant employment areas accessed from M60 J18, including Manchester's city centre and central business district, Bury town centre, Heaton Park and Pilsworth Road industrial estate.
- 2.1.4 Significant development allocations are proposed in Bury, Rochdale and Oldham through the Places for Everyone Plan (Greater Manchester Combined Authority (GMCA), 2021) and Atom Valley, Manchester's Mayoral Development Zone. The Places for Everyone Plan is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes and sustainable growth. Atom Valley aims to deliver 1.6 million square metres of employment space, 20,000 jobs and 7,000 homes over three major employment sites, including the Northern Gateway development between M60 J18 and M62 J19 in South Heywood. The Northern Gateway proposal includes up to 1.2 million square metres of employment floorspace in the area immediately to the north-east of M60 J18, and over 2,500 residential units around Simister and Heywood. It is anticipated that these developments would impact on both the M60 and M62, leading to extra pressure on M60 J18.
- 2.1.5 If the capacity constraints on the northern section of the M60/M62 are not addressed, its impact on the wider transport network in the north could hold back growth across the region. Some of the busiest stretches of road outside the M25 are located between Junctions 8-18 of the M60, and the combination of local and strategic traffic, coupled with the design of the road, further exacerbates congestion and environmental problems.
- 2.1.6 Further details on the need for the Scheme can be found in the Case for the Scheme (TR010064/APP/7.1).

2.2 Scheme objectives

Objectives

2.2.1 The main objectives of the Scheme are to:

- Improve the journey experience for users of this section of our network by:
 - Reducing congestion at peak times
 - Reducing journey times
 - Delivering more reliable journey times
- Provide a Scheme that is safe for all road users
- Minimise the impact of the Scheme on the surrounding environment including within Noise Important Areas and Air Quality Management Areas
- Support future economic growth across the Greater Manchester area by delivering against local aspirations set out in regional and local authorities' transport strategies and local plans

2.2.2 The Road Investment Strategy 2 (RIS2) (Department for Transport (DfT), 2020) has an ambition to develop a greener network, specifically through (pages 19-20, DfT (2020)):

- *'The majority of all vehicles using the SRN, including almost all cars and vans, are zero emission at the tailpipe, transforming the impact of the SRN on air quality and carbon emissions.'*
- *'The SRN makes extensive and effective use of environmentally and visually sensitive 'green infrastructure', modern materials and careful planting, including trees. Together, these minimise and mitigate the air, light, noise, visual, and water quality impacts of the SRN on those living or working near to it, and sustain habitats and enhance biodiversity.'*
- *'Enhancements to the network create roads that fit with their surroundings and which keep negative consequences to a minimum. In particular they employ high standards of design, responding to place-specific issues and in keeping with the natural, built and historic environment.'*

2.2.3 RIS2 (DfT, 2020) also sets Key Performance Indicators (KPIs), including an environmental component, which the Scheme aims to contribute towards. These indicators are set out below:

- Improving safety for all
- Providing fast and reliable journeys
- A well maintained and resilient network
- Delivering better environmental outcomes

- Meeting the needs of all road users
- Achieving efficient delivery

2.2.4 Details of how the Scheme meets these KPIs can be found in the Case for the Scheme (TR010064/APP/7.1).

Design principles

2.2.5 The Scheme design is in accordance with National Highways' 10 principles of good design published in The Road to Good Design (Highways England, 2018) to support their aspirations for a network that responds better to both people and places through improved design processes. These promote environmentally sustainable design that fits in context, while making roads safe, useful and understandable. The 10 principles state that good design:

- Makes roads safe and useful
- Is inclusive
- Makes roads understandable
- Fits in context
- Is restrained
- Is environmentally sustainable
- Is thorough
- Is innovative
- Is collaborative
- Is long-lasting.

2.2.6 The Scheme is in accordance with the requirements of Design Manual for Roads and Bridges (DMRB) GG 103 Introduction and General Requirements for Sustainable Development and Design (Highways England, 2019). This document describes how sustainable development and good road design can be applied to the design of motorway and all-purpose trunk roads.

2.2.7 The Scheme is in accordance with DMRB LD 117 Landscape Design (Highways England, 2020a) which considers the landscape in more detail in relation to good design of roads. The Scheme is also in accordance with DMRB LA 104 Environmental Assessment and Monitoring (Highways England, 2020b), paragraph 3.23 which covers the mitigation hierarchy of avoid, reduce then remediate.

2.2.8 DMRB LD 117 Section 3, Design Objectives, describes the design strategy for good road design through demonstrating an approach to:

1. *'protection and enhancement of the local environment;*

2. *sensitivity to the local context - its numerous, and sometimes complex combinations of landscape elements of fields, heathland, hedges, lanes, settlements and woodland;*
3. *interest by creating a sequence of attractive views, extending views along the road or maintaining existing views;*
4. *integration of footpaths, bridleways, and side roads into the landscape to minimise severance;*
5. *integration of roadside barriers, fences and walls with their surroundings;*
6. *structure designs to be slender and unobtrusive, respecting the local landscape character;*
7. *assessment of tranquillity and its importance to the local context and/or wildness;*
8. *sensitivity to and respectful of 'dark skies' areas, minimising adverse environmental impacts and intrusion caused by lighting;*
9. *reflection and integration of the surrounding pattern and species grouping in any new planting;*
10. *reflection and integration of enhancement opportunities to biodiversity;*
11. *safeguarding individual trees/woodland as well as ecological interests; and*
12. *protection and enhancement of the surrounding historic environment'.*

2.2.9 The Scheme-specific design principles below have been identified in relation to the environmental design and incorporated into the Scheme design:

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

- Provide visual interest for local residents, users of public rights of way (PRoW) and users of greenspace.

2.2.10 Further details regarding design principles and considerations for the Scheme can be found in the Scheme Design Report (TR010064/APP/7.6).

2.3 Scheme location

2.3.1 The Scheme is located at M60 J18 (Simister Island), north of Manchester (National Grid Reference SD 82825 05937) (as shown on Figure 1.1: Location Plan of the Environmental Statement Figures (TR010064/APP/6.2)).

2.3.2 The Scheme is wholly located within the administrative boundary of Bury Metropolitan Borough Council and is close to Rochdale Borough Council, Salford City Council, Manchester City Council and Oldham Metropolitan Borough Council. Local Planning Authority boundaries are shown on Figure 1.1: Location Plan of the Environmental Statement Figures (TR010064/APP/6.2).

2.3.3 As noted in paragraph 1.2.3 of Chapter 1: Introduction of this Environmental Statement (TR010064/APP/6.1), the interchange is situated on more than one motorway and as a result has three junction numbers: M60 J18, M66 J4 and M62 J18. For the purpose of this Scheme, and therefore this Environmental Statement, the interchange is referred to as M60 J18.

2.3.4 M60 J18 provides the interchange between the M60, M62 and M66 motorways. The Scheme encompasses the following motorways and slip roads:

- M60 between J17 – J18, in eastbound and westbound directions
- M60 between J18 – J19, southbound and northbound, partly
- M60 J17 eastbound entry slip road and westbound exit slip road
- M60 J18, including all entry and exit slip roads to and from the M60, M62 and M66 motorways
- M66 motorway from the M60 J18 (M66 J4) to M66 J3, partly

2.3.5 The Scheme is situated between several urban areas and settlements including Whitefield, Prestwich, Simister and Middleton. The Scheme is situated in an urban fringe landscape, with urban settlements to the west, north and south of the Scheme and predominantly low-lying Grade 3/4 agricultural land to the east (see Chapter 9: Geology and Soils of this Environmental Statement (TR010064/APP/6.1) for further details regarding the agricultural land baseline). The majority of the Scheme location falls within Green Belt.

2.4 Baseline scenario

Existing baseline

2.4.1 The existing baseline is the current baseline conditions at the time of the assessment, without implementation of the Scheme.

2.4.2 The environmental baseline is described within the 'Baseline conditions' section of each aspect chapter of this Environmental Statement (TR010064/APP/6.1). Key environmental constraints are shown on Figure 2.1: Environmental Constraints of the Environmental Statement Figures (TR010064/APP/6.2) and include, but are not limited to, the following:

- Greater Manchester Air Quality Management Area (AQMA) located within the Order Limits.
- Noise Important Areas (NIAs) covering M60 J17 and J18 and sections of the adjacent motorways.
- Heaton Park Registered Park and Garden located adjacent to the Order Limits between M60 J18 and J19.
- Two non-designated historic buildings (Cold Gate Farm and Droughts Farm) located adjacent to the Order Limits.
- Two Grade II listed buildings (Brick Farmhouse and Unsworth War Memorial) located within 300m of the Order Limits.
- Designated and non-designated ecological sites located near to the Order Limits, including:
 - Hazlitt Wood Site of Biological Importance (SBI), located approximately 3m south-east of the Order Limits.
 - Hollins Vale Local Nature Reserve (LNR), located approximately 30m west of the Order Limits.
 - Hollins Plantation SBI, located approximately 30m west of the Order Limits.
 - Hollins Vale SBI, located approximately 200m north-west of the Order Limits.
 - Philips Park and North Wood SBI, located approximately 200m west of the Order Limits.
 - Heaton Park Reservoir (East) SBI and Heaton Park Reservoir (West) SBI, located approximately 300m south of the Order Limits.
 - Pilsworth SBI, located approximately 300m north-east of the Order Limits.
- Rochdale Canal Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), located within 200m of the Affected Road Network (ARN) (see Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1) for further details regarding the ARN), approximately 5km east of the Order Limits.
- Green Belt land, located within the Order Limits around M60 J18 (extending north, south and east of the junction).

- Bury Unitary Development Plan (1997) Policy EN9/1 Special Landscape Area (SLA), located within the Order Limits north-east of M60 J18.
- Several PRow and one permissive path (the Haweswater Aqueduct underpass) located within the Order Limits.
- Two main rivers (Parr Brook and Castle Brook) and ordinary watercourses located within or near to the Order Limits.

2.4.3 Within or near to the Order Limits protected or notable species, such as great crested newt (*Triturus cristatus*), common toad (*Bufo bufo*), bats, brown hare (*Lepus europaeus*), hedgehog (*Erinaceinae europaeus*), water shrew (*Neomys fodiens*), wintering birds, breeding birds, badgers, and invasive species, such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*), have been recorded. See Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1) for further details regarding the ecological baseline.

2.4.4 The settlements of Unsworth, Simister, Whitefield, Prestwich and Kirkhams are located close to the Scheme, with some residential dwellings located adjacent to or in close proximity to the Order Limits. In addition, there are educational facilities such as Unsworth Academy, Parrenthorn High School and St Margaret's Church of England Primary School located close to the Order Limits, and community facilities such as Pike Fold Golf Club and Unsworth Cricket Club, located within or adjacent to the Order Limits.

2.4.5 Haweswater Aqueduct is located within the Order Limits 500m west of M60 J18. Haweswater Aqueduct supplies most of Greater Manchester's population with their daily water supply.

Future baseline

2.4.6 The future baseline is the likely evolution of the existing baseline due to natural changes and without implementation of the Scheme. Changes to the existing baseline conditions may occur due to a combination of natural influences (e.g. climate change) and human influences (e.g. new developments and changes in land use).

2.4.7 Future baseline scenarios are defined in Chapter 4: Environmental Assessment Methodology of this Environmental Statement (TR010064/APP/6.1). The future baseline is described within the 'Baseline conditions' section of each aspect chapter of this Environmental Statement (TR010064/APP/6.1). A summary of the future baseline is provided below.

- 2.4.8 There are several reasonably foreseeable proposed developments within or close to (up to 2km) the Order Limits. In addition, there are several development land allocations identified in the Places for Everyone Plan (Greater Manchester Combined Authority (GMCA), 2021) and Atom Valley (discussed in Section 2.1 of this chapter). Major housing allocations of between 1,200 to 1,550 homes at Heywood and Pilsworth and Simister and Bowlee fall partly within the Order Limits. The Places for Everyone Plan is expected to be adopted by the end of 2023. A full list of reasonably foreseeable proposed developments has been produced for the cumulative effects assessment in Chapter 15: Assessment of Cumulative Effects of this Environmental Statement (TR010064/APP/6.1).
- 2.4.9 Wider environmental changes are also predicted to occur over time as a consequence of factors such as climate change which, for example, could increase the risk and intensity of flood events affecting the road network. The future baseline for climate is based on 2018 UK Climate Projections and is described in more detail in Chapter 14: Climate of this Environmental Statement (TR010064/APP/6.1).

2.5 Scheme description

- 2.5.1 The Scheme works, comprising the authorised development, are described in Schedule 1 of the draft DCO (TR010064/APP/3.1). The General Arrangement Plans (TR010064/APP/2.2) illustrate the design of the Scheme and identify its key components and features. The Engineering Section Drawings (TR010064/APP/2.8) present further Scheme design information. Reference to these plans is made in the following sections where applicable. Chainages referenced in this section are shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2).

Highway alignment

- 2.5.2 Table 2.1 summarises the elements/sections of the Scheme. These elements are shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2) and the General Arrangement Plans (TR010064/APP/2.2).

Table 2.1 Scheme highway elements/sections

Highway element/section	Description	Alteration of existing alignment or new element
M60 Mainline J17 to J18	Widening of the M60 carriageway between J17 and J18 from four lanes to five lanes in both directions and installation of a hard shoulder.	Alteration of existing alignment
Northern Loop (M60 eastbound to M60 southbound free flow link)	A new free flow link from the M60 eastbound to the M60 southbound (the 'Northern Loop').	New element. This element would be mainly on an embankment

Highway element/section	Description	Alteration of existing alignment or new element
M66/M60 Mainline	Widening of the M66 southbound through M60 J18 from two lanes to four lanes.	Alteration of existing alignment
M60 northbound to M60 westbound free flow link	Widening from one lane to two lanes.	Alteration of the existing alignment. This element would consist of cutting (M60 northbound) and embankment (M60 westbound)
M66 southbound diverge	Realignment of the M66 southbound diverge slip road to M60 J18 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.	Alteration of existing alignment. This element would be on an embankment
M60 eastbound to M66 northbound free flow link	The existing one lane free flow link would be retained. The alignment of the approach to the free flow link would change as the M60 eastbound off-slip to the J18 circulatory would be closed for use by the public. Access to the circulatory would be provided to authorised vehicles only.	Alteration of existing alignment
M62 westbound to M60 southbound free flow link	Realignment of the existing free flow link.	Alteration of existing alignment
M60 J18 circulatory carriageway (i.e. the M60 J18 roundabout)	The M60 eastbound off-slip to J18 and southbound on-slip to the M60 would both be closed for use by the public, with only authorised access provided; the lanes on the roundabout would change to a new alignment to reflect the closures.	Alteration of existing alignment

2.5.3 The Scheme alignment and Order Limits are shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2). The Order Limits include permanent land take (23.08 hectares (ha)), required for the Scheme (including environmental mitigation) and temporary land take (11.09ha) required for construction, including construction compounds, temporary works, statutory undertaker diversions, material storage and haul routes.

Structures

2.5.4 The locations of new major structures and gantries are shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2).

2.5.5 The Scheme would require two new major structures:

- Simister Pike Fold Viaduct – a three-span bridge (west, east and main span) to carry the new M60 eastbound to M60 southbound link (the Northern Loop) over the M66 and slip roads (approximately 13m above the level of the M66 carriageway), approximately 70m north of M60 J18. The spans are approximately 43m for the west span, 56m for the main span, and 43m for the east span. The viaduct would comprise a composite weathering steel girder and reinforced concrete (RC) superstructure, supported on RC piers and full-height RC abutments with mechanically stabilised earth (MSE) wingwalls. An access route would be provided to the internal area of the Northern Loop to allow for maintenance of vegetation during operation.
- Simister Pike Fold Bridge – a standard height (approximately 5.7m above the adjacent M66 carriageway), single-span fully integral bridge carrying the M66 southbound off-slip road over the Northern Loop, some 350m north of M60 J18. The span would be approximately 43m. The bridge would comprise a weathering steel girder and RC superstructure, supported on MSE abutments and wingwalls.

2.5.6 Plates 2.1 and 2.2 illustrate three-dimensional (3D) models of Simister Pike Fold Viaduct and Simister Pike Fold Bridge, respectively. Detailed drawings can be found at Sheets 22 and 23 of the Engineering Section Drawings (TR010064/APP/2.8).

Plate 2.1 3D model of Simister Pike Fold Viaduct

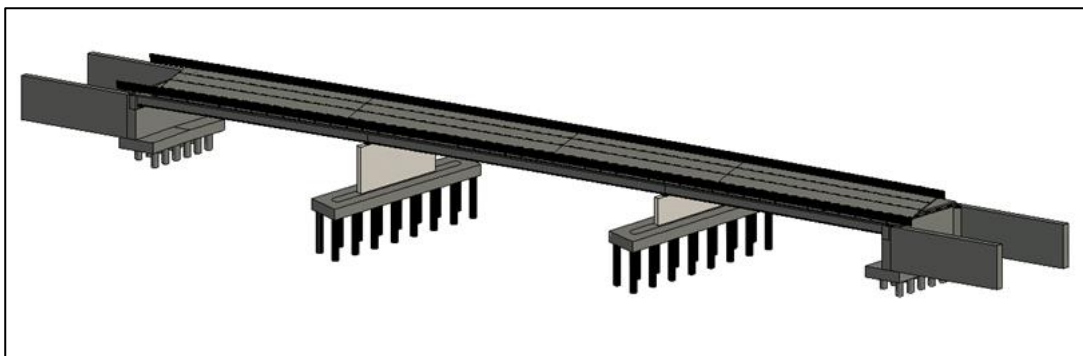
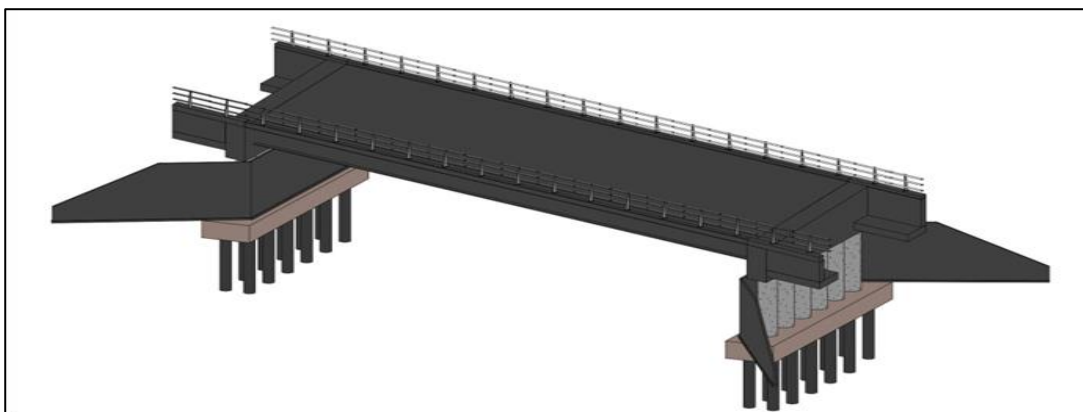


Plate 2.2 3D model of Simister Pike Fold Bridge



- 2.5.7 The M60 eastbound and westbound carriageways on the Haweswater Aqueduct underpass would be widened to accommodate a hard shoulder. This would be achieved with new separate retaining walls above the existing buried structure, which would otherwise be unaffected.
- 2.5.8 Two existing overbridge piers in the M60 central reserve would receive pier collars to provide continuity with the adjacent new rigid concrete barrier (RCB) vehicle restraint system (VRS). Headroom and verge piers are assumed to be unaffected within the Scheme extent.
- 2.5.9 Nine existing gantries would be retained. Seven gantries would need to be demolished due to clashes with the highways design and four gantries would receive new direction signs and electronic message signs. The leg of two existing portal gantries in the central reserve would receive encapsulation to strengthen them against vehicular impact and provide continuity with the adjacent new RCB, while the legs in the verge should remain unchanged with VRS located in front.
- 2.5.10 Nine new gantries would be required; these would be steel lattice type structures and one of the following types:
- Single-span portal (with a support in the verge and central reserve)
 - Super-span portal (spanning the entire motorway)
 - Motorway Signal Mark (MS) MS3 cantilever
 - Long-span cantilever gantries (with a single support in the verge)
- 2.5.11 Two of these new gantries require a gantry leg in the central reserve, which would include a plinth to provide continuity with the adjacent new RCB.
- 2.5.12 The locations and types of the new gantries are summarised in Table 2.2. Further details regarding new gantries can be found on the General Arrangement Plans (TR010064/APP/2.2).

Table 2.2 New gantries

Highway section	Gantry type	Chainage
M60 eastbound	MS3 cantilever	1858
	Superspan portal (approximate 56m span)	2152
	Single-span portal (approximate 39m span, support in central reserve)	2579
M60 westbound	Super-span portal (approximate 52m span)	1947
	Single-span portal (approximate 25m span, support in central reserve)	1384

Highway section	Gantry type	Chainage
M66 southbound	MS3 cantilever	3699
	Sign and signal long span cantilever	3470
		2426
		1333

2.5.13 Plate 2.3 shows a sign and signal long span cantilever gantry on the M60.

Plate 2.3 A sign and signal long span cantilever gantry on the M60



Embankments and retaining walls

- 2.5.14 The Scheme would require a number of embankments and cuttings to accommodate the horizontal and vertical alignment of the new road. As a general principle, these slopes would be 1:3 (1 in 3) gradient, with the exception of one retaining wall on the M60 eastbound between Sandgate Road and Haweswater Aqueduct underpass (chainage 2048 to 2310) at 1:2.5 (1 in 2.5) gradient.
- 2.5.15 Earthworks have been designed to allow for planting on them where practicable to screen views of the Scheme (see Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2) for planting to be provided).

2.5.16 Retaining walls would be provided in some areas instead of earthwork slopes to reduce the footprint of the Scheme and reduce encroachment into third party land. The locations of retaining walls are shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2) and the General Arrangement Plans (TR010064/APP/2.2). Table 2.3 lists the retaining walls to be provided.

Table 2.3 Retaining walls

Element/ section	Chainage		Approximate total length (m)	Approximate height of retaining wall (m) (and chainage)		Existing earthwork (cutting/ embankment)
	Start	End		Minimum	Maximum	
M60 eastbound	1595	1653	58	0.0 (1595)	2.7 (1650)	Embankment
	1670	1720	50	0.2 (1720)	1.8 (1690)	Embankment
	1730	1890	160	0.6 (1730)	2.9 (1820)	Cutting
	1936	1960	24	0.9 (1936)	1.3 (1950)	Embankment
	2048	2310	262	1.5 throughout		Embankment
	2334	2558	224	1.6 (2340)	4.6 (2550)	Embankment
M60 westbound	1960	1927	33	0.03 (1927)	1.0 (1940)	Embankment
	1891	1653	238	0.8 (1860)	1.8 (1891)	Cutting
	1450	1263	187	0.4 (1450)	2.0 (1380)	Cutting
M66 northbound	1483	1732	249	0.02 (1720)	1.7 (1540)	Cutting
	1164	1279	115	0.3 (1279)	1.8 (1190)	Cutting
M66 southbound	1160	1280	120	0.9 (1280)	2.6 (1190)	Cutting
	1320	1342	22	1.3 (1320)	2.0 (1330)	Cutting
	1485	1500	15	1.2 (1485)	1.6 (1490)	Cutting
	3448	3490	42	0.7 (3490)	1.8 (3470)	Cutting

2.5.17 The Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) provides indicative areas for natural grading of levels, which would be provided to maximise the re-use of uncontaminated excavated materials on site and thereby reduce the need for offsite disposal of surplus material. However, these would be subject to the soils balance and detailed design.

Road pavement and re-surfacing

2.5.18 The existing surfacing along the Scheme alignment has a mixture of road surfacing, with sections of hot rolled asphalt and some low noise surfacing.

- 2.5.19 A conventional low noise surface can provide up to -3.5 decibel (dB) reduction compared to a standard hot rolled asphalt where speed levels are above 75kph (see Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) for further details). The use of a conventional low noise surface is a form of embedded mitigation (i.e. mitigation which is an integral part of the Scheme design) and would be installed throughout the Scheme alignment, except between M60 J17 to J18 where provision of better performing low noise surfacing with a Road Surface Influence (RSI, a measure of the acoustic performance of a road) of -6dB would be installed as an additional mitigation measure to reduce adverse noise impacts from vehicles using the Scheme (see Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) for further details).

Watercourse crossings

- 2.5.20 Haweswater Aqueduct, which passes underground between M60 J17 and J18, would not require modification. The Scheme would not require new crossings of watercourses or alterations to existing watercourse culverts.
- 2.5.21 Chapter 13: Road Drainage and the Water Environment of this Environmental Statement (TR010064/APP/6.1) considers watercourses that may be affected by the Scheme.

Drainage

Existing drainage network

- 2.5.22 The existing drainage network serving M60 J18 comprises the following primary drainage elements:
- Carrier pipes and drains
 - Filter drains
 - Kerbs and gullies
- 2.5.23 The highway drainage network serving M60 J18 generally discharges into watercourses via ditches or drains.
- 2.5.24 Based on the information included in the Highways Agency Drainage Data Management System (HADDMS) (National Highways, 2023) and closed-circuit television (CCTV) survey, there is no presence of any attenuation features. This is not unusual considering the age of when the original drainage networks were constructed. It should be noted that the existing information is limited, and a number of assumptions have been implemented based on professional judgement. These assumptions are detailed in Section 3.9 of Appendix 13.7: Drainage Strategy Report of the Environmental Statement Appendices (TR010064/APP/6.3). Where assumptions have been considered relating to the existing drainage network the worst-case scenario is presented. Further investigation would be undertaken at the next stage of the design.

Drainage design

- 2.5.25 The drainage design has been developed in accordance with the DMRB CG 501 Design of Highway Drainage Systems (National Highways, 2022c) and following discussions with the Lead Local Flood Authority (Bury Metropolitan Borough Council) and the Environment Agency. Full details of the drainage strategy can be found in Appendix 13.7: Drainage Strategy Report of the Environmental Statement Appendices (TR010064/APP/6.3).
- 2.5.26 The drainage design includes an allowance for the effects of climate change over a 100-year period. A climate change allowance of 30% has been applied, together with a sensitivity test which considers a 40% climate change uplift in peak rainfall intensity.
- 2.5.27 Where feasible, surface water runoff would be discharged to the following hierarchy order:
- Into the ground (infiltration)
 - To a surface water body
 - To a surface water sewer, highway drain, or another drainage system; and
 - To a combined sewer.
- 2.5.28 As the Scheme is, for the most part, modification of the existing highway alignment, the general strategy is that the drainage of highway run-off would follow the existing arrangement and would only be adjusted to suit new pavement locations, before continuing to attenuate and ultimately discharge at the watercourse or existing highways network. The drainage system would discharge into the existing system where feasible.
- 2.5.29 The Scheme would result in an additional paved area of approximately 5.3ha, which would require additional attenuation storage to reduce the risk of flooding. Attenuation storage would be provided within ponds, carrier drains and manholes, or a combination of all three measures. Runoff rates would be restricted to existing site condition runoff rates for online road widening, or greenfield runoff rates for new offline road sections. The use of sustainable drainage systems (SuDS), such as ponds and swales, is required to mitigate for failures in water quality as well as for attenuation. Water quality failures were recorded, using Highways England Water Risk Assessment Tool (HEWRAT), in the absence of mitigation measures, for the following drainage outfalls: 1a/b, 2, 4 and the cumulative assessment of outfalls 4 and 7 (see Chapter 13: Road Drainage and the Water Environment of this Environmental Statement (TR010064/APP/6.1) for further details).

2.5.30 A total of five ponds and three swales would be provided for attenuation and/or water quality treatment purposes. See Table 2.4 for the locations of the ponds, approximate pond volumes for attenuation and/or treatment, and their connections to outfalls. The locations of the ponds and swales are also shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2) and the General Arrangement Plans (TR010064/APP/2.2). The naming of the ponds corresponds to the outfalls the ponds connect to, which in turn correspond to drainage catchments (see Chapter 13: Road Drainage and the Water Environment of this Environmental Statement (TR010064/APP/6.1) for further details regarding catchments and existing and new outfalls). The Scheme does not include a Pond 3 or Pond 6. Catchment 3 is not affected by the Scheme, therefore no pond is proposed (see paragraph 1.3.3 of Appendix 13.2: Water Quality Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3)) and attenuation of catchment 6 would be provided by oversized pipes (see paragraph 2.5.33 of this chapter for further details).

Table 2.4 Ponds

Pond name	Location	Approximate pond volume for attenuation and treatment (m ³)		Connects to outfall	New or existing outfall
		Attenuation	Treatment		
Pond 1	South of Pike Fold Golf Club (east of the M66)	3,200	1,300	1a/b	Existing and new
Pond 2	Land to the south of Griffe Lane	N/A*	700	2	Existing
Pond 4	North-east of St Margaret's Church of England Primary School (south of the M60 northbound to M60 westbound link)	2,600	810	4	Existing
Pond 5	Field immediately north of Bridle Road and Heaton Park between M60 J18 and J19	900	690	5	Existing
Pond 7	Land south of Mode Hill Lane (north-west of M60 J18)	1,300	160	7	New

*Pond 2 is provided for treatment purposes only; attenuation is provided by oversized pipes to connect to the existing drainage network.

2.5.31 The ponds are designed to be permanently wet in order to function as retention basins and achieve the desired treatment efficiencies, in accordance with DMRB CG 501.

- 2.5.32 In addition to ponds, runoff would be collected via surface water channels, kerbs and gullies, filter drains, slit drains, linear drains, combined kerb drainage and combined carrier and filter drains. Oversized pipes (1.2m diameter) would be installed in the central reservation of the M60 mainline from Haweswater Aqueduct underpass and would tie into the existing drainage network prior to the Bury Old Road overbridge.
- 2.5.33 To accommodate the runoff from additional impermeable areas due to the new Northern Loop, Pond 1 would be provided within the field just north-east of M60 J18. In addition to this, a swale would be constructed almost immediately after the pond to provide additional treatment, and flow would outfall locally into the existing Castle Brook tributary situated just north of Egypt Lane. Flows from a new outfall would be restricted to greenfield runoff rates or 2l/s/ha, whichever is higher.
- 2.5.34 The level of water quality treatment required for routine highway surface water runoff to receiving water bodies varies within the Scheme depending on the catchment size and the contributing paved area. Treatment levels and pollution control requirements have been assessed in accordance with DMRB LA 113 Road drainage and the water environment (Highways England, 2020c). Further information on the HEWRAT assessment can be found in Chapter 13: Road Drainage and the Water Environment of this Environmental Statement (TR010064/APP/6.1) and Appendix 13.2: Water Quality Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Lighting

Existing lighting

- 2.5.35 Desktop study confirmed that existing lighting is located as follows:
- M60 J17 to J18 in the central reserve and both verges (Light Emitting Diode (LED))
 - M62 east of J18 (LED)
 - All slip roads and segregated left turn lanes (LED)
 - M60 J18 roundabout circulatory (High Pressure Sodium (SON))
- 2.5.36 All of the existing highways in the Scheme location are lit with high intensity discharge lamps.

New lighting

- 2.5.37 All of the Scheme would have lighting. The lighting design has been carried out in accordance with BS 5489 Design of Road Lighting – Lighting of roads and public amenity areas (British Standards Institution, 2020) and National Highways specifications, and also takes into consideration guidance notes from the Institution of Lighting Professionals, including Guidance Note 1 for the Reduction of Obtrusive Light (2020) and Guidance Note 8 Bats and Artificial Lighting (2018).

- 2.5.38 A Scheme-wide lighting assessment has been undertaken, with Annual Average Daily Traffic (AADT) data used to obtain a lighting classification. Adaptive road lighting, which is where lighting levels are varied during the night according to the level of road usage, the needs of road users and specific risks on the road, would be used. Adaptive road lighting varies between light class levels M1 to M6, where M1 is the highest lighting level and M6 the lowest lighting level. The stretch of road between M60 J17 and J18 would be lit to adaptive lighting class M2 and the slip roads to lighting class M3.
- 2.5.39 A lighting appraisal following the process outlined in DMRB TA 501 Road Lighting Appraisal (Highways England, 2020d) has been undertaken. The outcome of the appraisal confirmed that the Northern Loop, mainline and M60 J18 should be lit. LED luminaires would have a glare class of G4 or above and would be designed with a zero tilt to produce no upward glare and minimal back light. This is in accordance with the BS EN 13201-2:2015 Road Lighting Part 2: Performance (British Standards Institution, 2016) requirements which specifies which luminous intensity classes (G1-G6) are necessary to meet appropriate requirements for restriction of disability glare and control of obtrusive light. LED luminaire implementation within the Northern Loop is a result of modification to the road layout, as such new lighting would be required to accommodate for these changes and to upgrade the current high-pressure sodium lighting in keeping with the improvements to adjacent networks. While the Benefit Cost Ratio (BCR) value is low, therefore below the threshold for lighting (indicating there is no justification for lighting from an economic perspective), the Scheme would be lit on the basis of safety.
- 2.5.40 The lighting design for all the areas within the extent of the Scheme would be lit in accordance with BS 5489 (British Standards Institution, 2020) and DMRB TD 501 Road Lighting Design (Highways England, 2020e).
- 2.5.41 The Northern Loop link would have columns fitted with LED luminaires. The Scheme would introduce new lanes and widening of the existing slip roads, which would affect the existing lighting layout. Replacement lighting columns would be fitted with LED luminaires for better efficiency. At the completion of the Scheme all the luminaires would use LED light sources to offer improved energy efficiency, reduce maintenance, and improve control of the emitted light which would give less spill into adjacent areas and reduce upward light.

Technology

- 2.5.42 The roadside technology being designed as part of the Scheme includes the following:
- Variable message signs mounted on cantilever and long span cantilever gantries (known as Motorway Signal Mark 4 (MS4))
 - Advanced Motorway Indicators (AMI) above lane signals mounted on gantries
 - CCTV cameras
 - Above ground and inductive traffic detectors, Motorway Incident Detection and Automatic Signalling (MIDAS) loops

- Highways Agency Detection Enforcement Camera System (HADECS) and External Aspect Verification (EAV) technology
- Entry slip signals
- Electrical interface cabinets.

2.5.43 These technologies would be used to provide the Applicant the ability to monitor and manage the road network covered by the Scheme.

2.5.44 The Scheme would utilise many of the existing technologies and gantries but would increase the number of AMIs where necessary to align with the number of lanes between M60 J17 and J18. This is likely to include additional signage and gantries, particularly at the junctions where the design changes the junction layouts. This would assist in monitoring traffic flows and identifying incidents and queues.

2.5.45 Variable message signs, mounted on cantilever and long span cantilever gantries, would be used to display essential signaling to motorists, along with travel information and any potential or upcoming hazard warnings. These would be provided along the route, as specified in National Highways standards, and upstream of junction diverges. Signals would also be placed on these gantries above each lane to outline mandatory speed limits.

2.5.46 CCTV cameras would be positioned on both masts and gantries to provide a minimum of 95% coverage of the mainline with complete coverage of any emergency areas. Standard mast height would be between 10-15m above ground level to allow operators to visually monitor the network.

2.5.47 Traffic detection would be undertaken by a combination of MIDAS loops and radar units mounted on posts at approximately 500m intervals, and within a short distance of every gantry location to provide monitoring of traffic flows and Queue Protection.

2.5.48 Speed camera technology would be located at one gantry location per link, in order to enforce the variable mandatory speed limits set by the MS4s and AMIs to encourage motorist compliance.

2.5.49 Each of the above assets would require power, associated communication links and associated equipment cabinets to enable operation. These would be located in the verge near equipment clusters. Electrical interfaces would be provided at the highways' boundary, approximately every 1-2km, ideally over or under bridges or adjacent to local roads to ensure safe and easy access for maintenance workers.

Fencing and boundary treatment

2.5.50 The Scheme has allowed for boundary fencing to delineate the Scheme from the local area. Noise barriers, referred to as 'fencing', would be in line with DMRB standards. Ponds would be fenced to prevent access to the ponds and protect members of the public. Environmental fencing would be provided, where required, along M60 J17 to J18 and would also delineate the boundary where used.

- 2.5.51 The playing area for Pike Fold Golf Course is approximately 50m north of the Northern Loop (the M60 eastbound to M60 southbound free flow link), and 30m east of the realigned M66 southbound diverge link. In order to mitigate the risk of errant golf balls reaching and entering the highway on either link, new golf ball stop-netting would be installed along the boundary of the golf course or in the areas between the two links. Design work is ongoing to fully evaluate the risks and that the mitigation provided by the golf ball netting is proportionate to the risks to motorists, maintenance operatives and third parties on or nearby the strategic network. The exact alignment and design would be determined during detailed design but for the purposes of this Environmental Statement a worst-case scenario of netting of 25m in height has been assessed.
- 2.5.52 For comparison, the current playing area is approximately 40m to 50m from the M66 southbound carriageway and mitigation is provided in the form of dense woodland and an 8m high golf ball stop-net that is parallel with the M66 but is now completely enshrouded within the woodland located between the M66 southbound carriageway and the playing area. The General Arrangement Plans (TR010064/APP/2.2) as well as Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2) show the indicative location and alignment for the netting as assessed.

Utilities

- 2.5.53 The Scheme would interact with statutory undertakers assets owned and maintained by various companies. These companies include Electricity North West Limited (ENWL), Cadent Gas, National Grid Electricity Transmission, Mastdata, Openreach and United Utilities. National Highways communications and street lighting networks would require re-direction or amendment to ensure supply to new features is not affected.
- 2.5.54 Details of the individual statutory utility works would be developed during detailed design. The following utility companies have apparatus which require diversion, protective works or special working arrangements (see Section 2.6 of this chapter for further details):
- Cadent Gas (gas pipelines)
 - Electricity North West Limited (low voltage (LV) 6 kilovolt (kV) to 33kV underground cables and 33kV overhead cables)
 - Openreach (underground ducts)
 - United Utilities (potable water and wastewater)
 - National Grid (high voltage (HV) overhead cables)
 - Virgin Media (underground ducts)

Walkers, cyclists and horse-riders

- 2.5.55 Table 2.5 outlines PRow that would be stopped up with replacement route provided (see the Streets, Rights of Way and Access Plans (TR010064/APP/2.5) for further details). Replacement routes would be provided for all existing PRow affected by the Scheme, including any PRow where they are affected by new ponds or swales. Details of closures of PRow and permissive paths during construction are provided in the 'Public access' section of Section 2.6 of this chapter.
- 2.5.56 Effects on walkers, cyclists and horse-riders (WCH) from the Scheme are assessed in Chapter 12: Population and Human Health of this Environmental Statement (TR010064/APP/6.1).

Table 2.5 PRow to be stopped up and replacement route provided

PRoW reference	Location	Description
7WHI	Public footpath passes under the motorway through an underpass near Unsworth Academy. It connects Public Footpath 101BUR to Public Footpath 6WHI which runs along Griffe Lane.	Pond 2 would be created at the low point in the field next to the school playing field, requiring a section of the public footpath to be diverted around the north of the pond.
9WHI	Public footpath runs along Egypt Lane up to the M66 mainline and then runs parallel to the M66 mainline up to the Hills Lane overbridge.	Part of the footpath along Egypt Lane would be stopped up due to the construction of the Northern Loop north-east of M60 J18. The footpath would be diverted from Egypt Lane around the outside of the Northern Loop. The new loop structure would be on an embankment and the public footpath would be at the foot of the embankment. The public footpath would then transition to the top of an embankment between the realigned slip road and Pike Fold Golf Course before tying back into the existing alignment south of Hills Lane.
28aPRE and 29aPRE	Public footpaths form a loop to the north of bridleway 27aPRE (Bridle Road) in a field to the west of the M60 between J18 and J19.	Part of the footpath would be stopped up due to the creation of a permanent maintenance access route to Pond 5 in the south-east corner of the field. Changes to the footpath would maintain connectivity while avoiding the permanent maintenance access.

- 2.5.57 The Haweswater Aqueduct underpass permissive path would not be modified.

Environmental design and mitigation

- 2.5.58 The development of the Scheme design has been an iterative process which has considered the potential significant effects on environmental receptors. The first option in mitigating any impact is to seek design measures that would enable the impact to be avoided or, if this is not possible, reduced. This is referred to as embedded mitigation and includes measures such as changing the road's horizontal and vertical alignment, reducing the temporary and permanent footprint of the Scheme and altering construction methods.
- 2.5.59 Environmental considerations that have influenced the option development and selection process, and the Scheme design, are set out in Chapter 3: Assessment of Alternatives of this Environmental Statement (TR010064/APP/6.1).
- 2.5.60 Embedded mitigation is mitigation that has become an integral part of the Scheme design. It has arisen as a result of the environmental impact assessment (EIA) process and is part of good iterative design.
- 2.5.61 Embedded mitigation designed as part of the Scheme is described in this section. This includes (amongst other) the following:
- Landscape design, including planting, to screen views and integrate the Scheme into the local context.
 - Use of conventional low noise road surfacing to reduce noise impacts.
 - Limiting land take from current and proposed residential and employment land uses, community land and assets, and agricultural landholdings as far as practicable.
 - Consideration of flood risk when designing all elements of the Scheme, including designing drainage systems to avoid or reduce groundwater flooding.
 - Provision of SuDS and attenuation to reduce flood risk and mitigate water quality impacts.
 - Designing the Scheme in line with relevant standards to adapt to future climate change.
 - Designing lighting to best practice to reduce light spill and impacts on bats.
 - Limiting the amount of offline highways design to reduce material requirements and waste.
- 2.5.62 Embedded mitigation that is integral to the construction process, such as the siting of construction compounds and traffic management measures, is included in Section 2.6 of this chapter.
- 2.5.63 Further information on embedded mitigation relevant to specific environmental aspect assessments is provided in the aspect chapters 5 to 14 of this Environmental Statement (TR010064/APP/6.1).

- 2.5.64 It is not always possible to design out environmental impacts. As such, it is necessary to develop additional mitigation measures to reduce and, if possible, offset likely significant adverse environmental effects (known as essential mitigation measures), and to include land within the Order Limits to deliver these measures. Essential mitigation measures are those which are critical for the delivery of the Scheme and can be secured through statutory powers (the draft DCO (TR010064/APP/3.1)). Measures are required to reduce and, if possible, offset likely significant adverse environmental effects in support of the reported significance of effects in the environmental assessment.
- 2.5.65 Examples of permanent environmental mitigation that have been developed for the Scheme include road surfacing with better noise reducing properties than conventional low noise road surfaces to mitigate noise level increases from road traffic, flood risk mitigation, landscape planting to screen visual effects, and biodiversity habitat creation.
- 2.5.66 Further details on specific mitigation for each environmental aspect are provided in aspect chapters 5 to 14 of this Environmental Statement (TR010064/APP/6.1).
- 2.5.67 An Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) has been produced which shows the Scheme design and areas within the Order Limits identified for environmental mitigation. Chapter 7: Landscape and Visual of this Environmental Statement (TR010064/APP/6.1) describes the Environmental Masterplan in further detail.
- 2.5.68 The Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) shows both embedded and essential mitigation measures as integral elements of the Scheme design where these are known to be effective and deliverable. The mitigation measures shown on the Environmental Masterplan have been factored into the assessments of likely significant effects presented in this Environmental Statement (TR010064/APP/6.1).
- 2.5.69 Mitigation measures are also described in the Register of Environmental Actions and Commitments (REAC), which is within the First Iteration Environmental Management Plan (EMP) (TR010064/APP/6.5). The First Iteration EMP will be developed further prior to construction into the Second Iteration EMP to confirm how environmental mitigation will be delivered, and will be secured through Requirement 4 of the draft DCO (TR010064/APP/3.1). See the 'Environmental management' sub-section of Section 2.6 of this chapter for further details regarding management plans.

Land take

- 2.5.70 Land would be required both temporarily and permanently to construct, operate and maintain the Scheme. Temporary land would be land required in order to construct of the Scheme. Permanent land take requirements include the footprint of the new highway infrastructure and associated earthworks, drainage works and access roads, together with environmental mitigation areas such as landscape planting and biodiversity habitat creation.

2.5.71 Areas of land take are shown on the Land Plans (TR010064/APP/2.3). The total permanent land take within the Order Limits is approximately 23.08ha and total temporary land take approximately 11.09ha. In line with the principles of the Planning Act 2008 land take has been kept to a minimum and justification is provided in the Statement of Reasons (TR010064/APP/4.1).

Residues and emissions

2.5.72 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. This information is provided in the relevant aspect chapters. Table 2.6 sets out the residues and emissions that must be reported on to satisfy the EIA Regulations, as well as the aspect chapters which cover them.

Table 2.6 Residues and emissions

Residue or emission	Environmental Statement (TR010064/APP/6.1) aspect chapter where residue or emission is covered
Air pollution	Chapter 5: Air Quality
Light	Chapter 7: Landscape and Visual
Soil and subsoil pollution	Chapter 9: Geology and Soils
Loss of soil resource	Chapter 9: Geology and Soils
Types and quantities of waste	Chapter 10: Material Assets and Waste
Noise	Chapter 11: Noise and Vibration
Vibration	Chapter 11: Noise and Vibration
Water pollution	Chapter 13: Road Drainage and the Water Environment
Heat	N/A – scoped out of assessment (see Chapter 4: Environmental Assessment Methodology for further details)
Radiation	

Design uncertainty and limits of deviation

2.5.73 This Environmental Statement is based on a preliminary design of the Scheme. The location and Order Limits of the Scheme are shown on Figure 1.1: Location Plan of the Environmental Statement Figures (TR010064/APP/6.2).

2.5.74 In accordance with the guidance provided in the Inspectorate’s Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018), the Order Limits have been drawn to allow some flexibility. The Scheme design would be subject to detailed design before construction, and as such, the Order Limits need to accommodate any future design. Figure 2.2: Scheme Design and Figure 2.4: Temporary Works of the Environmental Statement Figures (TR010064/APP/6.2) show the maximum extents of the Scheme (i.e. the Order Limits), including temporary working areas that could be required for construction compounds, temporary works, material storage and haul roads, based on current knowledge.

2.5.75 In accordance with Requirement 3 of the draft DCO (TR010064/APP/3.1), the detailed design for the authorised development must accord with the preliminary Scheme design shown on the General Arrangement Plan (TR010064/APP/2.2), the Works Plans (TR010064/APP/2.4), and the Engineering Section Drawings (TR010064/APP/2.8), unless otherwise agreed in writing by the Secretary of State following consultation with the relevant planning authority and local highway authority on matters related to their functions and provided that the Secretary of State is satisfied that any amendments to the General Arrangement Plan (TR010064/APP/2.2), the Works Plans (TR010064/APP/2.4), and the Engineering Section Drawings (TR010064/APP/2.8) showing departures from the preliminary Scheme design would not give rise to any materially new or materially different significant adverse effects in comparison with those reported in this Environmental Statement.

Permanent works

- 2.5.76 Article 6 of the draft DCO (TR010064/APP/3.1) sets out LoD incorporated within the Order Limits to ensure a degree of flexibility when constructing the Scheme to reduce the risk that the Scheme as approved cannot be implemented for unforeseen reasons (and allow for temporary diversion works to maintain services) whilst ensuring that the works do not result in any materially new or materially different significant adverse effects in comparison with those reported in this Environmental Statement. LoD provide an envelope of development, as opposed to specific dimensions, and are used to allow design flexibility. Such flexibility is required, for example, to enable the Principal Contractor to alter their working procedures or make minor adjustments to the position of certain infrastructure in response to unforeseen ground conditions.
- 2.5.77 The LoD have been determined based on design, construction and buildability factors and environmental constraints, and have been taken into consideration as part of the EIA as reported in this Environmental Statement.
- 2.5.78 The LoD have been defined using lateral LoD for all permanent infrastructure elements of the Scheme, including utility diversions, and vertical LoD for the carriageways, off network accesses, PRow, ponds, gantries and utilities.
- 2.5.79 The extents of the lateral LoD are shown on the Works Plans (TR010064/APP/2.4) and the vertical LoD are referenced against the vertical profile levels indicated on the Engineering Section Drawings (TR010064/APP/2.8).
- 2.5.80 The approach of this Environmental Statement has been to assess the Scheme design based on the realistic worst-case scenario afforded by the LoD being sought within the DCO application. The worst-case assessment may vary depending on the environmental aspect under consideration; for example, the worst case for visual effects may be the maximum height of an acoustic barrier afforded within the LoD, while the reverse may be true for potential noise effects.

Temporary works

- 2.5.81 The construction methodology in Section 2.6 of this chapter provides descriptions for temporary construction activities and locations such as compounds. The construction methodology could change leading up to the construction start of works, particularly for elements of construction that are dependent on the supply chain (e.g. source of materials, plant, equipment, and the construction workforce), or for elements that are dependent on the detailed design. The construction methodology provided in Section 2.6 is based on maximum parameters, and therefore represents a reasonable worst-case on which this Environmental Statement is based.

Off-site works

- 2.5.82 Any off-site works that may be required would predominately be prefabrication of specific elements of works (i.e. gantries, bridge beams, steel fixing for sign bases etc.) and potentially material treatment (i.e. concrete crushing).

2.6 Construction, operation and long-term management

Construction

Construction programme and phasing

- 2.6.1 The Scheme would take over three years to construct, with an assumed opening year of 2029. An outline construction programme is provided in Table 2.7. Key milestones for the construction programme are as follows (note that the construction programme is subject to change):
- Mobilisation to site – Quarter (Q)4 2025
 - Start of works – Q1 2026
 - M66 southbound diverge traffic switch – Q1 2028
 - Northern Loop traffic switch – Q3 2028
 - Open for traffic – Q1 2029
 - Demobilisation from site – Q2 2029
- 2.6.2 The Scheme comprises elements of ‘online’ works, which require working on and directly adjacent to the existing motorway carriageways, and ‘offline’ works, which are located remotely from the current road alignments. Both online and offline works would likely be carried out concurrently.

Table 2.7 Outline construction programme

Key: coloured cells indicate an activity occurring during the relevant quarter of the construction programme.

Element of construction phase works	Programme	Duration (months)	2025	2026				2027				2028				2029	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Enabling works	Q4 2025 to Q1 2026	6															
Site establishment	Q4 2025 to Q1 2026	6															
Vegetation clearance	Q4 2025 to Q1 2026	6															
Online works	Q1 2026 to Q1 2029	39															
M60 J17 to J18 eastbound verge	Q1 2026 to Q2 2027	18															
M60 J17 to J18 westbound verge	Q1 2027 to Q2 2028	18															
M60 J17 to J18 central reservation	Q2 2028 to Q4 2028	9															
M66 J3 to J4 central reservation	Q2 2026	6															
M66 J3 to J4 northbound verge	Q3 2026 to Q2 2027	12															
M66 southbound verge	Q3 2027 to Q1 2028	9															

Element of construction phase works	Programme	Duration (months)	2025	2026				2027				2028				2029	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
M66 southbound verge (Northern Loop tie-in)	Q2 2028	6															
M62 westbound to M60 southbound verge	Q3 2026 to Q4 2026	6															
M60 J18 to J19 central reservation	Q1 2028 to Q2 2028	6															
M60 J18 to J19 westbound verge	Q2 2027 to Q4 2028	15															
M60 J18 roundabout	Q3 2028 to Q4 2028	6															
Finishing works	Q3 2028 to Q1 2029	9															
Offline works	Q4 2025 to Q2 2028	33															
North-east quadrant of M60 J18 temporary works	Q4 2025 to Q2 2028	33															
M66 southbound diverge	Q1 2026 to Q2 2028	27															
Northern Loop	Q1 2026 to Q1 2028	27															
South-west quadrant of M60 J18 temporary works	Q4 2026 to Q1 2028	18															

Element of construction phase works	Programme	Duration (months)	2025	2026					2027				2028				2029	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
M60 northbound to M60 westbound	Q1 2027 to Q1 2028	15																
Simister Pike Fold Bridge	Q1 2027 to Q4 2027	12																
Simister Pike Fold Viaduct	Q2 2026 to Q3 2028	30																
Pond 1	Q3 2026	3																
Pond 2	Q3 2026	3																
Pond 4	Q2 2027	3																
Pond 5	Q3 2027 to Q4 2027	6																
Pond 7	Q3 2026	3																

Enabling works

2.6.3 Post-DCO consent, the construction phase would commence with an initial period of four to six months, prior to the start of works, reserved for setting up temporary construction compounds, the diversion and protection of utility services (where required), archaeological mitigation (if required) and the implementation of other required environmental mitigation (such as protected species mitigation (if required)) before the main construction works could commence. This is the mobilisation period which is currently due to start in Q4 2025.

Main works

Online works

2.6.4 The online works would commence early in the programme to create additional room for temporary traffic management running and allow access into the verges.

2.6.5 The online works would include:

- Works to widen the M60 between J17 and J18 to five lanes with a hard shoulder. This would include drainage upgrades and barrier works to the existing central reservation.
- Works to tie the new Northern Loop link and re-aligned M66 southbound diverge into the existing M60 and M66, including creating extra lanes on the southbound M66 through M60 J18 by converting the hard shoulders to running lanes and realigning the central reservation.
- Elements of the new bridge structure to carry the Northern Loop over the M66 and its slip roads (e.g. bridge supports that are next to the M66).
- On the M66 and M60 approaches to M60 J18 works include; embankment widening, sheet pile installation, sign replacement, drainage replacement, safety barrier installation, fencing replacement, gantry upgrades, lighting replacement, and technology upgrades.
- Reconfiguration of lanes, signs and traffic signals (including signal timings) within the M60 J18 roundabout.

2.6.6 An outline construction programme for the online works is provided in Table 2.7 above.

2.6.7 The online works on the M60 would start with work in the verges, including drainage, surfacing and new safety barriers. To allow this, traffic would be moved away from the verges through the installation of temporary narrow lanes to provide working room. Once complete, traffic would be moved back towards the verges to provide safe working space for works in the central reservation.

- 2.6.8 The new verge infrastructure would include earthworks (where widening highway embankments), drainage, barrier works, signage, street lighting, technology and kerbing. This would also include structures activities which comprise installation of new gantries, demolition or modification of existing gantries, construction of a new retaining walls and all associated ground improvement/sub-structure works.
- 2.6.9 The central reservation works on both the M60 and M66 would take place during both daytime and night-time working, adopting new temporary traffic management layouts. Some elements of the work would require overnight closures due to restrictions in carriageway widths, existing constraints within central reservations/verges and the short distance between the junctions and proximity to existing slip roads. Measures to mitigate the impact of these works as far as possible, including restrictions on working hours, are detailed in the First Iteration EMP (TR010064/APP/6.5).
- 2.6.10 Works within M60 J18 roundabout and the improved M60 northbound to M60 westbound free flow link would likely be carried out as the final phase of online works.
- Offline works*
- 2.6.11 The completion of online central reserve works in the final phase (as described above) allows the ‘tie-in’ works for the offline sections to be completed alongside other works in the verges and nearside lanes.
- 2.6.12 The offline works would include:
- Construction of the new Northern Loop link from the M60 eastbound to the M60 southbound.
 - Re-aligned M66 southbound diverge slip road (including new single span bridge over the Northern Loop (Simister Pike Fold Bridge)).
 - Elements of the new drainage system, such as ponds.
 - Pike Fold Viaduct abutments.
 - Environmental and landscaping works.
- 2.6.13 An outline construction programme for the offline works is detailed in Table 2.7 above.
- Structures**
- 2.6.14 Construction of the two main structures on the Scheme – the Northern Loop three-span bridge (Simister Pike Fold Viaduct) and the single-span bridge on the new M66 southbound diverge (Simister Pike Fold Bridge) – would follow on from site setup, early earthworks activities, and construction of the temporary works for the structures.
- 2.6.15 Work on the Simister Pike Fold Bridge is programmed to take place between Q1 2027 to Q4 2027. This would allow for diverging traffic to be switched onto the new alignment, thus allowing construction of the new Northern Loop online tie-in.

2.6.16 Work on the Simister Pike Fold Viaduct is programmed to take place between Q2 2026 to Q3 2028. This programme is longer due to the increased span of the structure combined with the online works interface; a proportion of the works would need to be undertaken on overnight or weekend closures.

2.6.17 There would be ground improvement required to the new offline earthworks as well as the areas of structural abutments. The exact extents of the ground improvement are still to be confirmed, but may comprise removal of shallow soft soils, installation of vertical band drains, surcharging of embankments, settlement hold periods, and installation of vibrated stone-columns. There may also be an activity of excavation and replacement where there are shallow soft organic soil deposits with isolated pockets of peat present beneath embankments. Where excavation of soft soils and peat materials is required, they would be replaced by a suitable engineering fill which may be sourced from site won fill or imported.

Earthworks seasons

2.6.18 The extent and volume of earthworks is one of the determining factors for the duration of the programme. To maximise the efficiency of the earthworks' operations, these bulk activities would be carried out between mid-March and the end of October each year, where practicable. Activities completed during the bulk earthwork seasons would include the following outlined activities:

- Site establishment including construction of site compounds, haul roads and laydown areas
- Excavation of ponds as well as the pre-earthworks drainage
- Construction of temporary works for the structures, including the main piling platforms, crane pads and general working areas
- Preparation of any areas requiring ground improvement
- Construction of embankment areas outside of structures temporary works footprints
- Removal of structures' temporary works
- Backfill to structure abutments and wingwalls
- Completion of earthworks plugs to structures
- Earthworks landscaping to verges and offline areas

2.6.19 There may be earthworks activities completed outside of the bulk-earthworks season, if deemed necessary.

2.6.20 There would be earthworks required for the M60 online widening construction for both retaining wall construction and earthworks embankment widenings. These would be completed with access from both the M60 highways and the offline works areas.

Compounds and haul roads

2.6.21 The main site compound would be located to the north-west of M60 J18 on land south of Mode Hill Lane and Cowl Gate Farm, with satellite compounds located in the north-east and south-west quadrants of M60 J18 and at the Pond 2 and Pond 5 locations. The locations of the main site and satellite compounds and haul roads are shown in Figure 2.4: Temporary Works of the Environmental Statement Figures (TR010064/APP/6.2) and the Works Plans (TR010064/APP/2.4), and summarised in Table 2.8. The satellite compounds are named according to their relative direction from the M60 J18 roundabout.

Table 2.8 Main site and satellite compounds

Compound	Location	Description	Access
Main site compound	North-west of M60 J18 in land south of Mode Hill Lane and Cowl Gate Farm	Main offices, site welfare, vehicle recovery, parking for all staff, materials storage area.	Access road off Mode Hill Lane for initial enabling works only and haul road off the M60 eastbound to M66 northbound link. Access via Mode Hill Lane would remain an option for private cars accessing the site office throughout the construction period.
North satellite compound	North of M60 J18 in land north of Pike Fold Golf Club (Pond 2 location)	Compound area would comprise space for van parking, office/welfare units and materials storage area.	Access road off Griffie Lane to undertake main works.
North-east satellite compound	North-east of M60 J18 in land south of Pike Fold Golf Club	Van parking, office/welfare units and materials storage area.	Access via Egypt Lane for initial enabling works only, then access road off M66 southbound.
South-west satellite compound	South-west of M60 J18, adjacent to the M60 eastbound to M60 southbound link in land north of Simister Lane	Van parking, office/welfare units and materials storage area.	Access road off Simister Lane for initial enabling works only and M60 northbound to M60 westbound link.
South-east satellite compound	Between J18 and J19 of the M60, south of the mainline, in field north of Heaton Park (Pond 5 location)	Access road would be installed along with small area for welfare, parking and laydown.	Access to area off the M60 mainline using a 24/7 hard shoulder closure.

Logistics and traffic management

2.6.22 This section summarises logistics and traffic management (see the Outline Traffic Management Plan (TR010064/APP/7.5) for further details).

2.6.23 In outline the traffic management programme is as follows:

- M60 J17 to J18 works:
 - Phase 1: M60 eastbound – Q1 2026 to Q2 2027
 - Phase 2: M60 westbound – Q1 2027 to Q2 2028
 - Phase 3: M60 central reservation – Q3 2028 to Q1 2029
- M66 J3 to J4 works:
 - Phase 1: M66 central reservation – Q1 2026 to Q3 2026
 - Phase 2: M66 northbound through Simister Island – Q3 2026 to Q2 2027
 - Phase 3: M66 southbound through Simister Island – Q2 2026 to Q1 2028
 - Phase 4: M66 southbound diverge traffic switch and Northern Loop traffic switch – Q1 2028 to Q3 2028
 - Phase 5: Finishing works (M66 lane closures J3 to J4 central reservation) – Q2 2028 – Q3 2028
- M60 J18 to J19 works:
 - Phase 1: M60 southbound – Q3 2026 to Q4 2026
 - Phase 2: M60 northbound – Q2 2027 to Q4 2027
 - Phase 3: M60 central reservation – Q1 2028 to Q3 2028
- M60 J18 roundabout (Simister Island) – Q2 2028 to Q4 2028
- Local road network:
 - Compound connections (Mode Hill Lane) – Q4 2025 to Q2 2026
 - Balmoral Avenue / Warwick Close – works here would comprise mainly utility works. The programme for utility works is still to be determined, however, the utility works would be completed prior to the infrastructure in the respective areas.
 - Kenilworth Avenue – works here would comprise mainly utility works. The programme for utility works is still to be determined, however, the utility works would be completed prior to the infrastructure in the respective areas.

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

- 2.6.25 Examples of activities which may require carriageway closures include:
- Bridge beam installation
 - Gantry erection, modification and demolition
 - Bridge deck construction over live carriageways
 - Installation of certain signs and signals (e.g. on overhead gantries)
 - Cross carriageway drainage and ducting works
 - Abnormal load deliveries
 - Major surfacing and white lining operations
 - Temporary traffic management operations
 - Works associated with tie-ins for new carriageway construction and widening areas
 - Works required on slip-roads and link roads where there is insufficient room to carry out works safely
- 2.6.26 Closures would include combinations of single carriageways, both carriageways, slip roads and link roads. These closures would happen at night-time, and possibly over weekends, to minimise disruption. Suitable diversion routes would be put in place for motorway traffic. Existing diversion routes currently used by the Applicant would be utilised for the Scheme. Where the local road network (LRN) is to be used for diversions the details would be agreed with the Local Highways Authorities during the detailed temporary traffic management design phase prior to the commencement of construction. Further details regarding closures and diversions can be found in Chapter 4 of the Outline Traffic Management Plan (TR010064/APP/7.5).
- 2.6.27 For the online works described above, long-term temporary traffic management measures would be required during construction. These may include narrower lanes, temporary hard shoulder running, hard shoulder and lane closures, contraflow and tidal flow systems. Typically, temporary safety barriers and reduced speed limits are implemented with such measures for the safety of the road user and the construction workforce.
- 2.6.28 Temporary construction access and egress would be required off the SRN to access the offline works areas. The LRN in the Scheme area is not suitable for providing access and egress for the expected number and type of construction vehicles that would be needed for construction due to these roads having restricted access, being through dense residential areas and close to public amenities such as schools.
- 2.6.29 Some access from the LRN would be required to gain entry for construction traffic to the offline work areas during the early stages of the Scheme. This would include access off Mode Hill Lane, Griffie Lane, Simister Lane and Egypt Lane. This may involve some limited disruption to these roads, however, access for residents would be maintained throughout.
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- 2.6.30 Some construction activities would require large vehicle movements (e.g. abnormal loads for delivery of bridge beams) on the live carriageway. Such activities would be scheduled to take place during off-peak periods, at night or over weekend blockades to reduce the impact of these works on traffic flows. During such closures, consideration would be given to completing other works, such as surfacing and cross carriageway drainage, to maximise the use of the road occupancy and reduce further impact on road users.
- 2.6.31 Table 2.9 indicates traffic management measures for construction elements. The Outline Traffic Management Plan (TR010064/APP/7.5) provides detailed traffic management measures for each area of construction work. The Outline Traffic Management Plan (TR010064/APP/7.5) would be superseded by the Traffic Management Plan ahead of commencement of the construction phase of the Scheme. The Traffic Management Plan would be drafted in consultation with the local highway authority and submitted to the Security of State for approval in line with Requirement 10 of the draft DCO (TR010064/APP/3.1).

Table 2.9 Traffic management measures for construction elements

Construction element	Traffic management measures
Enabling works / site setup	Traffic management would be installed initially to enable access and egress to be constructed off the existing motorways and motorway slip/link roads. This would involve installation of temporary vehicle restraint barriers (overnight closures required) and reduced speed limits. Some traffic management may be required on the LRN to facilitate the construction of offline working areas and temporary access.
M60 J17-18 – online widening, hard shoulder and verge works (eastbound and westbound)	Traffic management where online widening works/verge works would take place would predominantly take the form of narrow lanes and installation of temporary vehicle restraint barrier to provide a safe working area for daytime working. Speed restrictions would be in place to facilitate this. A large proportion of night-time working and overnight closures would be required, due to the nature of the works, and where there is insufficient room or work area is too close to existing merges/diverges.
M60 J17 to J18 – central reservation works	Traffic management for central reservation works would be installed during night-time closures. Works would be completed predominantly in the daytime within the installed traffic management, with some works completed on night shift lane closures due to insufficient working room. Traffic would be shifted towards the verge making use of hard shoulder running and narrow lanes where required. There would be temporary traffic management arrangements on the slip and link roads of M60 J17 and J18 to facilitate this.
M60 J18 eastbound off-slip/designated free flow	Overnight working would be required for tie-in works of the new Northern Loop alignment into the existing M60 eastbound carriageway. Additionally, overnight working would be required for the finishing roadworks to the off-slip and designated free flow link. This would require full closures of the off-slip and designated free flow link with a suitable diversion put in place.

Construction element	Traffic management measures
M66 central reservation works	Traffic management for central reservation works would need to be carried out on daytime working by introducing new temporary traffic management layouts to create sufficient working room within the central reservation. Traffic would be shifted towards the verge making use of hard shoulder running and narrow lanes where required. There would be temporary traffic management arrangements on the slip and link roads of M60 J17 and 18 to facilitate this. Some full closures would be required due to the re-alignment of the central reservation. These may be done through up-and-over diversions over the junction to minimise disruption and diversion times. Following completion of the central reservation hardening the traffic would be switched back to the centre to allow verge works to commence.
M66 online widening, hard shoulder and verge works (northbound and southbound)	Traffic management where online widening works/verge works would take place would predominantly take the form of narrow lanes and installation of temporary vehicle restraint barrier to provide a safe working area for daytime working. Speed restrictions would be in place to facilitate this. Some overnight closures would be required at pinch points where there is insufficient room or work area is too close to existing merges/diverge.
Existing M66 southbound carriageway J3 to J4	<p>Where the new M66 J18 southbound diverge ties into the existing carriageway, overnight full closures may be required to tie the existing pavement into the new pavement and carry out temporary white lining.</p> <p>Where the new Northern Loop ties into the existing M66/M60 southbound; the M66 southbound traffic would be pushed into the two lanes closest to the central reservation, and the diverging traffic would use the newly constructed M66 southbound diverge alignment. This allows a permanent closure of lanes 1 and 2 of the M66 southbound to construct the online section of the new Northern Loop. Full closures would be required for finishing tie-in works.</p>
M60 Northern Loop structure	<p>The construction of the structure abutments and piers would be predominantly undertaken on daytime shifts behind temporary vehicle restraint barrier. However, overnight partial and full closures would be required for certain activities that comprise the overall construction of the structure and the construction and maintenance of temporary works.</p> <p>The installation of bridge beams and works to construct the bridge deck would be done under full overnight or weekend closures. This may be concentrated on partial spans at a time to limit the disruption caused to the whole junction.</p>
M60 J18 – J19 (southbound and northbound verge)	Widening and verge works to the M60 southbound and northbound south of J18 would be done behind temporary vehicle restraint barrier with traffic moved into narrow lanes. Some partial overnight closures would be required for finishing works and installation/removal of traffic management.

Construction element	Traffic management measures
M60 J18 – J19 (central reservation)	Central reservation works would be required on the M60 between J18 and J19. This works would include drainage replacement and central reservation hardening. The works would be predominately completed on dayshift. Traffic management would be installed in the form of narrow lanes to allow sufficient working room. Some night shifts would be required where there is insufficient working room.
M60 J18 roundabout	Works would take place on daytime working where possible, with a large proportion requiring night shift working for traffic management to be installed.
Gantry works – M60 and M66	Where there are new gantries to be installed, modifications to existing gantries, or demolition of existing gantries; full overnight closures would be required.
Technology and drainage	Overnight lane closures and full closures would be required where there is limited space in some verge areas to install directionally drilled telecommunications duct crossings and new drainage crossings under the existing M60/M66/M62 carriageways.
Restrictions / operational constraints	<p>Speed restrictions would be in place from when works commence until completion. Full closures and lane closures would take place overnight with the specific closure times to be determined in advance of works commencing and be subject to traffic counts. The aim would be to keep the motorway and junction running at full capacity during peak hours, however, there may be certain activities where this would not be possible and capacity may be temporarily reduced.</p> <p>All full closures would take place overnight or over weekends. All diversion routes for full closures would be pre-signed and advance warning signs would be installed prior to the closure dates.</p>

2.6.32 The current M60 west of J18 and M62 east of J18 have variable mandatory speed limits (VMSL) as they are Smart Motorways; the national speed limit is the maximum within these VMSL sections. The M60 south of J18 and M66 are standard motorways without VMSL with a 70mph national speed limit. Temporary speed limits would be determined ahead of construction following detailed temporary traffic management design. It is anticipated that a reduced speed limit would be imposed on the affected sections of the M60, M62 and M66 for the required duration of the works. The assumption is currently that the speed limit for traffic through the works would be 50mph (20mph below the national speed limit when traffic management is in place) and 40mph for incident management.

2.6.33 Piling would likely be required for new bridges, for retaining walls, and for the foundations for new gantries. Piled foundation depths are expected to be between 10m to 30m below ground level (note that is subject to change at detailed design). Some off-peak working may be required for piling works. Assumptions related to night-time piling works are included in Chapter 11: Noise and Vibration of this Environmental Statement (TR010060/APP/6.1).

Workforce management

- 2.6.34 Peak workforce travelling times are expected to fall in line with the usual peak commuting times of 07:00–09:00 hours and 16:00–18:00 hours. It is assumed that staff travelling to site by car would travel a distance of 50km in each direction, and 20% of staff would car share. It is likely that a proportion of the construction team would travel by shuttle bus from the main compound area to work fronts, satellite compounds and laydown areas where feasible to reduce the volume of site traffic on the road at these times.
- 2.6.35 This arrangement would not be possible for all sub-contractors/trade types due to the necessity of transporting work equipment in their company vehicles. Other methods of travelling to the Scheme and accessing work areas would be investigated during detailed design when the construction requirements for each element of infrastructure are confirmed.
- 2.6.36 The workforce size would vary throughout the construction period. During peak construction periods (Q1 and Q2 2027) there would be approximately 230 personnel working on the Scheme.

Working methods

- 2.6.37 The majority of the works would take place with appropriate traffic management in place. Normal daytime hours would be between 07:00 and 19:00 between Monday and Friday, and between 07:00 and 13:00 on Saturday. In addition, there may be an hour before or after these times for site set up and close down (this would include activities such as deliveries, movement to place of work and general preparation works, but would not involve operation of plant or machinery). During the summer months, the working hours could extend to 07:00 to 21:00 to make use of the longer daylight hours.
- 2.6.38 Work undertaken outside standard working hours, as well as on bank holidays, is considered off-peak working. There are certain exceptions where night-time, weekend, or public holiday working would be required. Evening and night working hours would be 19:00 to 07:00 Monday to Saturday. Saturday off-peak working hours would be 13:00 to 19:00. Sunday and public holiday off-peak working hours would be 07:00 to 21:00 for daytime and 21:00 to 07:00 for night-time.
- 2.6.39 Certain works would be required to be undertaken outside of the standard working hours as well as on public holidays. The Principal Contractor would provide appropriate advanced notice of all evening/night time/off-peak works to the relevant planning authority. Off-peak working hours would be required for the following activities:
- Installation, maintenance and removal of traffic management layouts
 - Demolition of existing structures, construction of new structures, and any potential movements of large transporters to deliver bridge superstructures and gantry steel sections to their temporary and permanent locations
 - Piling works for structures and retaining walls

- Removal, modification and installation of new signage/technology to existing gantries and traffic signs
- Central reservation works where daytime working is not suitable due to existing carriageway widths or proximity to existing slip merges/diverges
- Works on slip roads and designated free flow links where carriageway widths would not allow for daytime works
- Online works within the verges which cannot be safely completed under the daytime working room available behind the temporary vehicle restraint barrier
- Cross carriageway duct crossings
- Installation/removal of street lighting and traffic signals
- Online pavement construction and white lining of the existing carriageway and surfacing works to tie-in the existing carriageway to the new carriageway
- Emergency and planned carriageway maintenance and repair works
- Maintenance of plant and equipment requiring 24-hour operation such as pumps

2.6.40 Some compounds may be in 24-hour operation at certain stages of the construction programme to facilitate off-peak working.

Plant and equipment

2.6.41 Construction activities would involve the use of heavy plant items, for example excavators, dumper trucks, dozers, piling rigs, cranes, and demolition and compaction equipment. Table 2.10 lists typical plant and equipment required for construction activities.

2.6.42 Construction activities would involve the use of heavy plant items with the potential to emit high levels of noise and vibration and contribute to pollution, such as excavators, dumper trucks, dozers and compaction equipment. Noisy activities also include, but are not limited to, demolition of existing features and piling for structures and retaining walls. Further information of noise impacts during construction is included in Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1).

2.6.43 To mitigate the impacts associated with construction plant and equipment, standard mitigation measures would be undertaken as necessary during the construction phase of the works. This includes measures such as programming works to minimise work outside standard working hours and specifying use of lower-noise emitting equipment. This is standard sector practice in accordance with BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (British Standards Institution, 2014a) and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (British Standards Institution, 2014b).

Table 2.10 Typical plant and equipment required for construction activities

Construction activity	Typical plant and equipment required
Site clearance	Excavator with tree shears, woodchipper, strimmer, chainsaw, mechanical and hydraulic breakers
Earthworks	Roller, bulldozer, grader, excavator, material sorting plant, tractor with bowser, vibration plate, dumper truck, mechanical crusher, ground improvement plant (if required)
Drainage/ducting	Roller, excavator, dumper truck, tractor with trailer, thrust bore rig, concrete delivery truck, vibration plate, directional drilling plant
Pipe jacking / microtunneling	Microtunnelling machine, operation and distribution boards, jacking system, hydraulic power pack, slurry system, separation plant, lubrication system, excavator, mobile crane
Fencing	Excavator, auger, post knocker
Technology	Vibration plate, excavator, roader tipper and grab, directional drill rig, loader crane
Street lighting	Excavator, vibration plate, loader crane, auger, Mobile Elevating Work Platform
Pavement	Vibrating roller, floor saw, hammer drills, dumper truck, front loader excavator, asphalt paver, asphalt planer
Structures demolition	Dumper truck, loader crane, demolition excavator, concrete crusher, cherry picker
Structure construction	Vibration plate, roller, excavator, loader crane, self-propelled modular transporter, crane, cherry picker, piling rig, concrete pump, concrete delivery truck, sheet piling rig
Slipform	Slipform paver, concrete delivery truck, excavator and breaker
Archaeology excavation	Excavator, dump truck
Landscaping / Planting	Soil rotavator, auger, tractor and bowser, mechanical hydroseeder

Construction activity	Typical plant and equipment required
Miscellaneous	Delivery HGVs, motorised saws, concrete drills, tower lights, water management/treatment plant, generators, tractors, fuel bowsers, road sweepers

Earthworks

- 2.6.44 Large amounts of imported fill material may be required for construction, particularly for the Northern Loop. This may be reduced by recycling material generated on site. However, there is expected to be a significant shortfall of material, estimated at approximately 220,000m³. This volume excludes the ponds which are expected to generate up to 40,000m³ of arisings.
- 2.6.45 The primary aim would be to utilise arising cut material to construct the permanent earthworks and satisfy the fill deficit. However, this is subject to the arising material being suitable for reuse as an earthwork engineering fill.
- 2.6.46 Geotechnical investigations have been completed to give an indication of material acceptability in areas across the site. Geotechnical investigations indicate a presence of soils of high organic matter content in the north-east and north-west quadrants of M60 J18. The samples taken from the area of the Northern Loop are soft and are unlikely to meet the specification requirements for an engineering fill. Based on the initial investigation it is expected that there would be a high un-acceptability rate of arisings generated from Pond 4 and Pond 7.
- 2.6.47 The suitability of bulk material for reuse would be confirmed by material testing during the construction phase. Should bulk materials prove suitable for reuse they would be placed in an acceptable material class, with the intention to utilise the material in the permanent earthwork construction. Materials classified as unsuitable for use in permanent earthworks may be treated to improve the properties of the material, or may be incorporated into landscaping areas within the Order Limits or disposed of offsite.
- 2.6.48 To satisfy any remaining fill deficit, material would be imported. Imported material could come from various sources. Initially, the opportunity to reuse the surplus arising materials from other local and nearby construction schemes would be explored. Should this not be a viable option, local quarries would be used to satisfy the remaining fill deficit (see Chapter 10: Material Assets and Waste of this Environmental Statement (TR010064/APP/6.1) for further discussion regarding the sourcing of materials).
- 2.6.49 During the construction of Pond 4, the initial excavation would exceed the design invert level by approximately 2m (final depth to be confirmed during the construction phase). Additional excavated material would be replaced with uncontaminated soil and other naturally occurring materials that have been excavated during construction activities elsewhere on the Scheme. This operation is intended to obtain material that is suitable for embankment fill which would in turn reduce the quantities of imported material required.

2.6.50 All areas of cut and fill within the Order Limits would have the existing topsoil and, where necessary, sub-soils stripped and stored in local storage areas, where practicable. Temporary sites for soil storage have been identified and included within the Order Limits. These sites are illustrated on Figure 2.4: Temporary Works of the Environmental Statement Figures (TR010064/APP/6.2) as material storage areas. Further details of the procedures and measures that would be adopted and implemented to classify, track, store, reuse and dispose of the excavated materials that would be encountered during the construction of the Scheme are detailed in Appendix F: Outline Soil Management Plan of the First Iteration EMP (TR010064/APP/6.5). Stockpile heights of 3-4m are commonly used for topsoil that can be stripped and stockpiled in a dry state. No stockpiles greater than 4m in height would be used for topsoil or subsoil storage.

Drainage and de-watering

- 2.6.51 Ground investigation has been undertaken to determine the ground and groundwater conditions within the Order Limits. The information obtained has been used to inform the risk assessment of any identified contaminated land impacting on the groundwater and to determine the requirements for protective measures as necessary. An assessment of the requirement for dewatering activities as part of the construction works has also been undertaken following the ground investigation. The Ground Investigation Report (Appendix 9.3 of the Environmental Statement Appendices (TR010064/APP/6.3)) has been submitted with the DCO application.
- 2.6.52 Temporary site drainage would be planned to manage the risks associated with heavy rainfall or flood events appropriate to the risk during construction, such as the topography, catchment size and duration of the works. A number of discharge locations would be in operation concurrently through the Scheme and volumes would vary depending on the progress of the works programme. Outfalls from temporary site drainage would be to local surface water bodies and would maintain existing catchment boundaries wherever feasible.
- 2.6.53 Temporary site drainage would utilise the permanent ponds in the temporary situation where feasible to provide attenuation during construction, with additional ditch connections to watercourses.
- 2.6.54 Temporary pumping arrangements may also be required for localised pumping operations.
- 2.6.55 Essential mitigation measures would be utilised to prevent pollution of watercourses from surface water runoff during the construction phase, such as use of silt fencing, cut-off drains, and baffles at discharge locations. Further information on these measures can be found in Chapter 13: Road Drainage and the Water Environment of this Environmental Statement (TR010064/APP/6.1).
- 2.6.56 De-watering is expected to be required at deep excavation locations. At this stage, it is anticipated that de-watering would be managed by a 'sump pumping' type arrangement, which would involve excavating sumps at natural low spots around the periphery of the excavation area. Water would be directed to the sumps via grip drains and ditches around the periphery of the excavated area.

- 2.6.57 Pumps would remove water from the sumps to temporary attenuation features located adjacent to the excavation area for settlement and attenuation before discharge to local watercourses/drainage systems. If dewatering of an excavation is required, a groundwater recharge arrangement would be implemented to manage groundwater levels. The suitability of this method would be investigated through detailed design of the Scheme.
- 2.6.58 Environmental permits for groundwater abstraction and water discharge would be sought from the Environment Agency before this work commenced (see the Consents and Agreements Position Statement (TR010064/APP/3.3) for further details of permits, consents and licenses).

Utilities diversions and working around utilities

- 2.6.59 As stated in Section 2.5 of this chapter, the Scheme would interact with statutory undertakers' assets owned and maintained by various companies.
- 2.6.60 Construction of the Scheme would require the diversion, relocation or protection of a number of existing utility assets including potable water, wastewater, gas, electricity and telecommunications. Utilities work has been investigated and forms part of the Scheme construction works as assessed within this Environmental Statement.
- 2.6.61 The following subsections describe the utilities infrastructure that may be affected by the Scheme during construction. These utilities diversions would be further investigated and planned in detail by the construction contractor, in association with the appropriate utility companies, as part of the detailed design of the Scheme. Discussions have been held with individual statutory undertakers and the limits of deviation (see Section 2.5 of this chapter for further details) allow for temporary works to construct the diversion whilst maintaining the existing services.
- 2.6.62 Schedule 9 together with Article 40 of the draft DCO (TR010064/3.1) contains provisions to protect the interests including protection of electricity, gas, water and sewage undertakers (Schedule 9 Part 1), the electronic communications code networks operators (Schedule 9 Part 2), and Cadent Gas as a gas undertaker (Schedule 9 Part 3). The views of the undertakers who have interests affected would continue to be sought throughout the detailed design phase.

Gas

- 2.6.63 Cadent Gas is a gas distribution company that owns, operates, and maintains the gas distribution network within the Greater Manchester region. There is a high pressure gas main located at the northern extent of the Scheme crossing the M66. This high pressure gas main would not require diversion, however, Cadent Gas guidance on working in the vicinity of the gas main would be adhered to. There is also a low pressure gas main which directly feeds residential properties within the area around Balmoral Avenue. There is the potential for the low pressure gas main to require diversion or protection works. Details of the diversion or protection methods utilised would be dependent on the requirements for diversions of other utilities within the vicinity that cross the M60 from Balmoral Avenue towards Warwick Close (see paragraph 2.6.68).

Electricity

- 2.6.64 ENWL is the power network operator for the north-west of England. ENWL have several assets which have potential to be impacted by the Scheme. South of M60 J18 are located a 6kV cable and LV underground cable, crossing the M60. These assets may clash with the upgrade of highways infrastructure as part of the Scheme. On-site assessments at later stages of the Scheme would confirm the requirement for diversions.
- 2.6.65 There is an ENWL LV underground cable in the south-west quadrant which clashes with the design for the M60 northbound to M60 westbound free-flow link. The LV cable clashes with the earthworks and associated infrastructure; it is expected that this cable would need to be diverted or disconnected during construction.
- 2.6.66 ENWL have assets that cross access tracks to offline sections of the Scheme. To allow the construction of temporary access tracks that are suitable for plant trafficking, the assets would either be protected or diverted. The assets affected are located on Simister Lane, Corday Lane and Egypt Lane. Confirmation of the extents of the action to be taken would be confirmed by on-site assessments at later stages of the Scheme.
- 2.6.67 There are 11kV overhead cables located along the northern boundary of Pike Fold Golf Course. The overhead cables, owned and maintained by ENWL, would be in close proximity to Pond 2. The Scheme would be designed and constructed in accordance with ENWL's procedures for working around their assets to avoid the need for any disconnections or diversions.
- 2.6.68 Located along the M60 between J17 and J18 are several ENWL-owned cables which interface with the Scheme. Crossing the M60 between Balmoral Avenue and Warwick Close are three sets of 11kV and LV underground cables. The requirement to divert these cables at either the crossing locations or within the verges would be dependent on the cable depth and interaction with highways infrastructure. It is anticipated that the cables are at a depth greater than the surrounding infrastructure, however, further investigation would be undertaken to confirm the extents of the actions to be taken. Due to the proximity of these cables to other services on Balmoral Avenue and Warwick Close, if a diversion is required then further diversion works would likely be required to the other surrounding utilities.
- 2.6.69 National Grid owns and operates electricity transmission networks in the UK. Within the Order Limits there are two National Grid pylons, with several more located in close proximity to the Scheme. Running between the pylons are overhead cables. The overhead cables would not be affected by the design for the Scheme, however, the construction work methodology would be impacted and guidance on completing work within the vicinity of overheads would be followed.

Telecommunications

- 2.6.70 There is a telecommunication mast located in the north-east quadrant of the Scheme (approximately 20-30m north of the M62). The mast is shown to have no direct clash with the new infrastructure on the Scheme; however, the construction work methodology would take into consideration working near the structure.
- 2.6.71 Openreach maintains the telephone cables, ducts, cabinets, and exchanges across the UK. The Scheme interacts with several Openreach assets. To allow the construction of temporary access tracks that are suitable for plant trafficking, the assets would either be protected or diverted. The assets that would be affected by the temporary construction accesses are located on Corday Lane and Simister Lane. The extents of the action to be taken would be confirmed by on-site investigation at later stages of the Scheme.
- 2.6.72 Situated on Balmoral Avenue and Barnard Avenue are Openreach assets that directly feed residential properties. There is the potential for the asset to require diversion or protection works. Details of the diversion or protection methods utilised would be dependent on the requirements for diversions of ENWL assets that cross the M60 from Balmoral Avenue towards Warwick Close/Barnard Avenue (see paragraph 2.6.68).

Water and wastewater

- 2.6.73 United Utilities Group PLC (United Utilities) manages the regulated water and wastewater network in the north-west of England. The Scheme footprint interacts with several water and wastewater assets owned and maintained by United Utilities. It is anticipated that protection measures would be required to potable and wastewater United Utilities assets to allow the construction of temporary access tracks parallel to Corday Lane that are suitable for plant trafficking from Heywood Road. The extents of the action to be taken would be confirmed by on-site investigation prior to the main works in each location.
- 2.6.74 Haweswater Aqueduct underpass is located 500m west of M60 J18. This aqueduct supplies most of Greater Manchester's population with their daily water supply. This supply is provided in a culvert and abridged by the M60 between J17 and J18. Widening of the M60 eastbound and westbound carriageways on the Haweswater Aqueduct underpass (see the 'Structures' sub-section of Section 2.5 of this chapter for further details) would not require any diversion works to the main. The current structural widening would be to install a combined system of sheet pile wall and an L-shaped wall. The driven sheet piling system has been designed to stop 10m on plan away from the buried United Utilities assets. Protection measures may be required to facilitate construction of the Scheme, which would be planned in coordination with United Utilities.
- 2.6.75 Adjacent to the M66 southbound carriageway runs a United Utilities water main that is close to piling works for a new gantry installation. It is likely that protection measures or a diversion would be required to ensure that the piling works can be undertaken safely. Diversion and protection requirements would be confirmed prior to the main works in each location.

- 2.6.76 Situated on Balmoral Avenue and Warwick Close are watermains and a combined sewer, owned by United Utilities. There is the potential for the sewer and the water mains to require diversion or protection works. Details of the diversion or protection methods utilised would be dependent on the requirements for diversions of ENWL assets that cross the M60 from Balmoral Avenue towards Warwick Close (see paragraph 2.6.68).
- 2.6.77 Located on the verge of the M60 westbound carriageway, near Kenilworth Avenue, is a combined sewer that may require diversion works due to its proximity to the verge infrastructure. It is unlikely that a diversion would be required, however, the extents of action required would be confirmed prior to the main works in each location.

Public access

- 2.6.78 To allow construction of the Scheme, there would be direct and indirect impacts on PRow and permissive paths. Some would be closed temporarily for the duration of construction, whilst others would be maintained throughout but would experience some disruption during certain construction phases (see Chapter 12: Population and Human Health of this Environmental Statement (TR010064/APP/6.1) for further details). For existing WCH routes that are due to be temporarily stopped up and diverted during construction the Principal Contractor would undertake risk assessments as part of the detailed construction phasing to be developed during detailed design.
- 2.6.79 Table 2.11 lists the WCH routes that would require closure and diversion during construction (see the Streets, Rights of Way and Access Plans (TR010064/APP/2.5) for further details).

Table 2.11 WCH routes requiring closure and diversion during construction

WCH route reference	Description of route	Construction activities associated with required closure and diversion
Permissive path connecting Heybrook Close to Parrenthorn Road via Haweswater Aqueduct underpass	Permissive path (a path which the landowner permits the public to use, with the intention it should not become a PRow) that connects Derwent Avenue and Heybrook Close to Parrenthorn Road via an underpass under the M60. This is currently likely to be used by pedestrians to connect the communities in the north to the facilities in the south, including schools and leisure and sporting facilities. The route appears well used and offers a more direct route for schoolchildren than Sandgate Road, but can get very muddy, has no lighting provision, and has evidence of attracting anti-social behaviour.	Permissive path would be required to be closed during works associated with the widening of the highway around Haweswater Aqueduct underpass and works to the underpass structure. When completing works close to the underpass structure the permissive path would be closed for approximately four to eight weeks and the diversion would be over Sandgate Road. Construction traffic would be required to cross the permissive path while completing earthworks towards Sandgate Road (west of the permissive path). When construction traffic is crossing the permissive path, a controlled temporary crossing would be in place.

WCH route reference	Description of route	Construction activities associated with required closure and diversion
Public footpaths 28aPRE and 29aPRE	The footpaths are located in a field north, adjacent to Heaton Park and bridleway 27aPRE. Footpaths 28aPRE and 29aPRE form a loop to the north of bridleway 27aPRE and do not provide any meaningful recreational or active travel use. These routes were likely once connected to public footpath 29bPRE, with the connection severed by construction of the M60 motorway.	Public footpaths 28aPRE and 29aPRE would be permanently closed due to the construction and maintenance of Pond 5 (see Section 2.5 of this chapter for further details regarding ponds). A diversion route would be put in place alongside public footpath 27aPRE. A permanent replacement route would be provided (see Table 2.5 for further details).
Public footpath 9WHI	The footpath is located north-east of M60 J18. The public footpath runs along Egypt Lane before heading north parallel to the M66 and south of Pike Fold Golf Course to join Hills Lane, Unsworth.	The public footpath would be closed during construction over a duration of approximately 36 to 42 months until a replacement route has been provided (see Table 2.5 for further details).
Public footpath 84BUR	The footpath is located north of M60 J18 and runs north-east from Hollins Lane and then turns north to follow a route parallel to the M66 motorway.	The footpath would be closed for approximately two to four weeks during piling works for a new gantry (see Table 2.2 of this chapter for further details regarding gantries). A diversion route via The Hags would be provided.

2.6.80 Table 2.12 lists the WCH routes that would not require closure but would be utilised by construction traffic during construction. The Principal Contractor would undertake risk assessments to ensure safety for users of these routes. There would be low volumes of construction traffic along WCH routes that are to be used by construction traffic. Where construction traffic must cross these routes to access work areas controlled temporary crossings would be utilised.

Table 2.12 WCH routes that would not require closure but would be utilised by construction traffic during construction

WCH route reference	Description of route	Construction activities associated with use of WCH route
Public footpath 46WHI	The footpath starts at Simister Lane and runs north to cross the M62 on an overbridge and connects to public footpaths 50PRE and 9WHI.	Construction vehicles would use the footpath during the initial enabling works phase to gain access to the working area for the Northern Loop via Egypt Lane.
Public footpath 50PRE	The footpath crosses the M62 and provides access from Simister Lane to Lower Droughts Farm.	

WCH route reference	Description of route	Construction activities associated with use of WCH route
Public footpath 7WHI and restricted byway 101BUR	The footpath and restricted byway crosses under the M66 at Unsworth Academy and allows access for school pupils to the school playing fields east of the M66.	Construction vehicles would be required to cross the path due to works to construct Pond 2 (see Section 2.5 of this chapter for further details regarding ponds). When construction traffic is crossing the path, a controlled temporary crossing would be used next to the work area so access to the school is not hindered. The controlled crossing would be in place for approximately four to twelve weeks.
Public footpath 12WHI	The public footpath is located north-west of Simister Island, along Mode Hill Lane.	Construction vehicles would be required to use Mode Hill Lane to access the main site compound (see the 'Compounds and haul roads' section of Section 2.6 of this chapter for further details regarding the construction compounds). A pedestrian barrier and controlled pedestrian crossings would be in place at the entrance to the site compound over a period of approximately 36 to 42 months.
Restricted byway 89BUR	The byway is located north of M60 J18. The byway runs along Griffie Lane and connects to restricted byway 85BUR which crosses the M66 via Castle Road overbridge.	Construction vehicles would use Griffie Lane to access the working area for the construction of Pond 2 (see Section 2.5 of this chapter for further details regarding ponds). When construction traffic is crossing the path, a controlled temporary crossing would be used next to the work area so access to the school is not hindered. The controlled crossing would be in place for approximately four to twelve weeks.

2.6.81 During construction there would be impacts on businesses bordering the Scheme such as golf courses, Prestwich Heys Football Club and local schools due to temporary land take requirements, disruption to access and loss of amenity during construction from factors such as dust, noise and visual intrusion (see Chapter 12: Population and Human Health of this Environmental Statement (TR010064/APP/6.1) for further details). Construction would be planned to limit the impact upon these receptors and keep key stakeholders informed and involved in the planning and delivery of the Scheme. A Community Liaison Manager would form part of the project team and would be the designated point of contact for key stakeholders and the general public to manage these relationships before and during the construction phase.

Environmental management

- 2.6.82 All construction works would be undertaken with appropriate environmental controls in place, in line with an EMP. The EMP is produced and refined through three iterations during the Scheme lifecycle:
- The First Iteration EMP (TR010064/APP/6.5) has been produced during the preliminary design stage of the Scheme and is submitted with the DCO application.
 - The Second Iteration EMP refines the First Iteration EMP and is produced during the construction preparation stage and must be approved by the Secretary of State for Transport prior to commencement and the start of the construction phase.
 - The Third Iteration EMP refines the Second Iteration EMP to support future management and operation and is produced at the end of construction.
- 2.6.83 The First Iteration EMP includes the REAC, which outlines the essential mitigation developed as part of this Environmental Statement. The First Iteration EMP has been produced in line with the requirements of DMRB LA 120 Environmental Management Plans (Highways England, 2020f).
- 2.6.84 The management plans are secured under Requirement 4 of the draft DCO (TR010064/APP/3.1). Requirement 4 states that the authorised development must be carried out substantially in accordance with the First Iteration EMP. Requirement 4 also requires the preparation of a Second Iteration EMP and Third Iteration EMP in consultation with the relevant planning authority and for its approval by the Secretary of State.
- 2.6.85 A Second Iteration EMP would be developed prior to the start of construction works, and would be substantially based on the First Iteration EMP. The Second Iteration EMP would include the implementation of industry standard practice and control measures for environmental impacts arising during construction, such as, but not limited to, the control of dust, noise and other emissions, and the approach to waste and material management onsite.

Carbon management

- 2.6.86 In order to deliver National Highways' aspirations with respect to the minimisation of carbon emissions and the efficient use of resources, the carbon intensity of the Scheme would be established and monitored throughout the design and construction phases.
- 2.6.87 Processes to evaluate greenhouse gas emissions associated with construction of the Scheme are embedded into the design process, thereby informing and identifying opportunities for iterative reductions in such emissions. These processes have supported the preliminary design decision-making (see Section 14.9 of Chapter 14: Climate of this Environmental Statement (TR010064/APP/6.1) for further details), allowing greenhouse gas emissions to be considered in a timely manner, rather than at the end of the design process. The sharing of information is being promoted, along with the identification of innovations and engagement with suppliers, across the project team to ensure that greenhouse gas emissions along the supply chain have been considered.

2.6.88 Further details regarding carbon management can be found in the Outline Carbon Management Plan (Appendix O of the First Iteration EMP (TR010064/APP/6.5)), which has been submitted with the DCO application.

2.6.89 Section 14.9 of Chapter 14: Climate of this Environmental Statement (TR010064/APP/6.1) provides details of actions that have been incorporated into the design to reduce greenhouse gas emissions and also provides examples of options that would be considered during detailed design when identifying potential opportunities to further reduce greenhouse gas emissions.

Sustainable procurement

2.6.90 In addition to ensuring a carbon efficient design, a sustainable procurement strategy would be implemented to ensure that low carbon materials are, where practicable, specified and that the carbon intensity of materials and sub-contract packages is measured and monitored throughout. This would include the responsible sourcing of the key material elements (asphalt, concrete, aggregate, steel, aluminium, plastics, timber and wood-derived products) to be used in the construction of the Scheme (see Chapter 10: Material Assets and Waste of this Environmental Statement (TR010064/APP/6.1) for more details).

Materials and waste management

2.6.91 Material resource efficiency would be implemented throughout the detailed design and construction of the Scheme. This would include the implementation of resource-efficient construction principles, adoption of responsible sourcing practices, preparation of a Site Waste Management Plan and compliance with relevant legislation, policies and statutory guidance for materials and waste. Site-won (including demolition and excavation) materials arising from the Scheme would be reused and recycled, and where practicable, construction materials would be responsibly sourced from local sources of supply with consideration for secondary and recycled content.

2.6.92 An Outline Site Waste Management Plan (Appendix C of the First Iteration EMP (TR010064/APP/6.5)) has been submitted with the DCO application.

Operation and long-term management

2.6.93 There are several principles which the Scheme is actively pursuing for the maintenance of assets once operational. These include, but would not be limited to, the following:

- Exploring off network access for assets to reduce the number of lane or road closures required to facilitate maintenance.
- Combining maintenance programmes to allow for the most effective use of traffic management and reduce the amount of work requiring deployment of traffic management on the network.
- Subsoil / substrate and topsoil requirements for species rich grassland would be specified to ensure successful establishment and meet safety requirements.

- All grassland and wildflower seed mixes for areas that are deemed safety critical, such as sight lines, in front of signs and access areas, would be selected which allow proper establishment while maintaining safety critical requirements.
- Species would be selected following National Highways' Major Project Instruction for Low nutrient grasslands (MPI-85-102020) (Highways England, 2020g) for soft estate safety requirements whilst creating greater biodiversity on the SRN.
- Seed mix selection would be cognisant of the short term to medium term challenges to successful establishment from climate change.
- Use of roadside technology to facilitate maintenance, including exploring the use of wireless assets to reduce the need for ducting.
- Exploring the diversion of statutory utility corridors outside the highway boundary (but within the Order Limits) to reduce the operational impact to the highway when assets require maintenance.
- During detailed design, materials would be further considered which could reduce the amount of maintenance required for an asset.
- Complementing national policies to reduce the risk to road workers and researching the potential application of new and innovative solutions which could be of benefit to operations and maintenance.

2.6.94 Maintenance activities would be as authorised under the DCO. As described in the First Iteration EMP (TR010064/APP/6.5), industry standard control measures would be applied and encapsulated in the Third Iteration EMP, which would be produced once construction of the Scheme is completed.

2.6.95 Landscape planting would require maintenance as part of the long-term management, including grass strimming, watering and weed control. Maintenance would be planned to ensure the successful establishment of any planting.

2.6.96 The Outline Landscape and Ecological Management Plan (Appendix N of the First Iteration EMP (TR010064/APP/6.5)) contains further details of how landscape and ecological mitigation would be reinstated, monitored and maintained. A detailed landscape specification and maintenance schedule would be produced at the detailed design stage.

2.7 Demolition

2.7.1 It is considered highly unlikely that the Scheme would be decommissioned before the end of its design life of 60 years as the road would have become an integral part of the SRN. In the unlikely event of the Scheme needing to be demolished, this would conform to the statutory process at that time, including any requirements for EIA as appropriate.

2.7.2 Demolition of the Scheme is not therefore considered further in this Environmental Statement. However, an embedded mitigation measure has been included in the REAC, which is contained within the First Iteration EMP (TR010064/APP/6.5), that requires the implementation of Design for Resource Efficient Construction Principles to identify how materials can be designed to be more easily adapted over an asset's lifetime and how de-constructability of elements can be increased at end of first life (Commitment M1 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)) (see Section 10.9 of Chapter 10: Material Assets and Waste of this Environmental Statement (TR010064/APP/6.1) for further details).

2.8 Changes in traffic flows

2.8.1 The impact that the Scheme is predicted to have on traffic flows is discussed in detail in the Transport Assessment (TR010064/APP/7.4). A summary of the predictions is provided below:

- Journey times through M60 J18 would continue to worsen in the future if the Scheme is not built.
- The free flow link for traffic travelling between M60 J17 and M60 J19 removes a substantial traffic flow from the M60 J18 roundabout, reducing delays for other movements.
- There would be less delay caused by traffic joining and leaving the M60 between J17 and J18 as a result of the fifth lane on the M60 between these junctions.
- The Scheme would offer journey time savings of up to 1 minute 30 seconds from M60 J17 to M60 J19 and up to 3 minutes during rush hour between M66 J3 and M60 J17, compared to a scenario where the Scheme is not built.
- Some local roads would experience decreases in traffic due to the Scheme because reductions in delay on the motorway network would make this more attractive than travelling on local roads.
- A small number of local roads would experience increases in traffic, especially those which would be used to access the M60 in the vicinity of J18.

Acronyms and initialisms

Acronym or initialism	Term
AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
AWI	Ancient Woodland Inventory
CCTV	Closed Circuit Television Camera
dB	Decibel
DCO	Development Consent Order
DDMS	Drainage Data Management System
DfT	Department for Transport
EAV	External Aspect Verification
EIA	Environmental Impact Assessment
ENWL	Electricity North-West Limited
GMCA	Greater Manchester Combined Authority
ha	Hectare
HADECS	Highways Agency Detection Enforcement Camera System
HEWRAT	Highways England Water Risk Assessment
HV	High Voltage
KV	Kilovolt
LED	Light Emitting Diode
LNR	Local Nature Reserve
LoD	Limits of Deviation
LRN	Local Road Network
LV	Low Voltage
MIDAS	Motorway Incident Detection and Automatic Signalling
MS	Motorway Signal Marker
MSE	Mechanically Stabilised Earth
NIA	Noise Important Area
PRoW	Public Rights of Way
Q	Quarter

Acronym or initialism	Term
RC	Reinforced Concrete
RCB	Rigid Concrete Barrier
RIS	Road Investment Strategy
RSI	Road Surface Influence
SAC	Special Area of Conservation
SBI	Site of Biological Importance
SLA	Special Landscape Area
SON	High Pressure Sodium
SRN	Strategic Road Network
SSSI	Site of Special Scientific Importance
SuDS	Sustainable Drainage Systems
VMSL	Variable Mandatory Speed Limit
VRS	Vehicle Restraint System
WCH	Walking, Cycling and Horse-Riding

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