

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Glossary, abbreviations and references

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Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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1 Glossary

This section includes terms relevant to the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES).

Term	Definition
abutment	A point where two structures meet, which support or anchor the end of a bridge.
Additional Provision	An amendment to a hybrid Bill being considered by Parliament. Additional Provisions cover changes that involve the acquisition or use of land outside the original limits of the Bill, additional access rights, or other changes to the powers conferred by the Bill.
Additional Provision 1 (AP1) amendments	Amendments to the original scheme reported in the AP1 ES that involve the acquisition or use of land outside the original limits of the Bill, additional access rights or other extensions of the powers included in the Bill.
Additional Provision 1 (AP1) revised scheme	The original scheme as amended by the SES1 changes and AP1 amendments.
Additional Provision 1 Environmental Statement (AP1 ES)	A set of reports that describes whether and how the works associated with AP1 give rise to new or different significant environmental effects to those previously reported.
Additional Provision 2 (AP2) amendments	Amendments reported in the AP2 ES that involve the acquisition or use of land outside the original limits of the Bill, additional access rights or other extensions of the powers included in the Bill.
Additional Provision 2 (AP2) revised scheme	The original scheme as amended by the SES1 and SES2 changes and AP2 amendments.
Additional Provision 2 Environmental Statement (AP2 ES)	A set of reports that describes whether and how the works associated with AP2 give rise to new or different significant environmental effects to those previously reported.
Agricultural Land Classification	The system devised and introduced by the Ministry of Agriculture, Fisheries and Food (in England and Wales) to classify agricultural land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. Land is graded from 1 (excellent quality) to 5 (very poor quality), with grade 3 subdivided into agricultural subgrades 3a and 3b. See 'best and most versatile (see BMV) land', 'Grade 1-5' and 'Subgrade 3a and 3b'.
Air Quality Management Area	An area within a local authority boundary where the air quality objectives are not likely to be achieved. The local authority is required to declare the area as an air quality management area and to prepare a local air quality action plan.
ALARP principle	As low as reasonably practicable - A rule which involves weighing a risk against the time and cost needed to control it.

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Term	Definition
alighters	Passengers exiting a train at a given station.
alluvium	Loose, unconsolidated material comprising clay, silt, sand, gravel deposited by flowing water, typically in floodplain areas, which can contain layers of peat.
ambient sound	The all-encompassing sound at a given location and time. It will generally include sound from many sources near and far. Ambient sound can be quantified in terms of the equivalent continuous sound pressure level, LpAeq,T.
ancient woodland	Land that has been continually wooded since at least 1600 AD in England and Wales and 1750 AD in Scotland.
Ancient Woodland Inventory	A map-based record of all ancient woodland in England and Wales.
aqueduct	A system of pipes, ditches, canals, tunnels, and supporting structures used to convey water from its source to its main distribution point.
aquifer	A geological formation that is sufficiently porous and permeable to store and yield a significant quantity of water to a borehole, well or spring.
archaeological anomaly	A location identified during a geophysical survey that indicates the presence or possible presence of an archaeological feature or features.
archaeological potential	A location where the data collected and reviewed indicate that archaeological assets may be present.
assemblage (ecology)	A group of species found in the same location.
attenuation tank	An attenuation tank is usually installed within a drainage system just prior to the point of discharge from a site to help control the rate of water flow during high flow conditions.
auto-transformer feeder station	A compound located next to the high speed railway that contains equipment to transfer electrical power between the National Grid network and the high speed railway's overhead line equipment.
auto-transformer station	A compound located next to the high speed railway at approximately 5km (3 mile) intervals. It contains electrical equipment to provide distribution of power along the high speed railway.
avoidance	Prevention of impacts occurring, having regard to predictions about potentially negative environmental effects (e.g. project decisions about site location or design).
balancing pond	Part of a drainage system that is used to temporarily store, and thereby attenuate, the flow of surface water runoff.
baseline	Existing environmental conditions present on, or near a site, against which future changes can be measured or predicted.

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bedrock	Rock that underlies loose deposits such as soil or alluvium.
biodiversity	The biological diversity of the earth's living resources. The total variability among organisms and ecosystems.
blockade	Where construction or maintenance requires the total closure of a railway line or station usually to allow engineering works.
boarders	Passengers boarding a train at a given station.
bored tunnel	A tunnel constructed using a tunnel boring machine.
borehole	A hole bored into the ground, usually as part of investigations, typically to test the depth and quality of soil, rock and groundwater. A borehole can also be used to dewater the ground.
built heritage	A heritage asset (historic asset in Scotland) that is a structure or building visible above ground level.
bulk building materials	Construction materials, such as concrete, aggregates or steel.
bund	An embankment that acts as a visual or noise screen, or as a barrier to control the spillage of fluids.
cantilever	A structure supported or fixed at one end only.
carr	Fen woodland or scrub that is typically dominated by alder or willow species.
catchment (water)	The area of land from which water flows into a watercourse or waterbody.
circa	Meaning 'approximately'. Often used in a historic context in reference to a date.
civil engineering	A branch of engineering that deals with the design, construction and maintenance of the physical and naturally built environment. Examples of civil engineering works include construction of roads, railways and dams.
climate change projections	Projections of changes in climate variables expressed in terms of the difference between the absolute future climate and a baseline climatology for a given location, time period and emissions scenario of greenhouse gases.
Code of Construction Practice	A document setting out the measures and standards to which a developer or contractor must adhere in order to provide effective planning, management and control of potential impacts on individuals, communities and the environment during construction.
colliery	A coal mine, including its associated buildings and equipment.
committed development	A development that has full or outline planning permission, or is allocated in an adopted development plan.

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community area	Defined areas along the Proposed Scheme (e.g. Hough to Walley's Green community area). They are used as a geographical basis for reporting local community and environmental impacts and effects in the Environmental Statement.
compensation (ecology)	Measures taken to make up for the loss of, or permanent damage to, ecological features despite mitigation. Replacement areas should be similar in terms of biological features and ecological functions to that lost or damaged, or with appropriate management have the ability to reproduce the ecological functions and conditions of those biological features.
conceptual site model	The method used to identify the various types of risk relating to contaminated land. The conceptual site model includes: categorisation of sources of contamination; categorisation of potential receptors; and identification of potential contamination pathways (i.e. linking sources to receptors).
congestion	When an increase in vehicular traffic disrupts free movement, causing reduced speeds, increased journey times and increased vehicular queuing.
conservation	The preservation or enhancement of a species/habitat or building/structure.
conservation area	An area designated under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990 or the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 as being of special architectural or historic interest and with a character or appearance which is desirable to preserve or enhance.
construction	The works necessary to build a proposed development.
construction compound	An enclosed area providing facilities for construction staff and storage of construction equipment. See 'satellite compound' and 'main compound' for further information.
construction siding	Construction sidings will connect with the existing railway network to enable loading and unloading of trains delivering material to an HS2 site or removing excavated material (see also: 'siding').
construction worksites	Sites where the construction of the various elements of the Proposed Scheme (e.g. viaducts and tunnels) is undertaken.
controlled waters	Rivers, streams, estuaries, lakes, canals, ditches, ponds and groundwater as far out as the UK territorial limit. The statutory definition is provided in Section 104 (1) of the Water Resources Act 1991 and Section 30A (d) of the Control of Pollution Act 1974.
conveyance capacity	The water carrying capacity of the water channel for a given channel gradient, shape and roughness.
copse	A small group of trees.

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Term	Definition
Country Park	Country Parks were established as a result of the Countryside Act 1968. Natural England recognises Country Parks as significant places that contribute to England's accessible natural greenspace.
critical load	A quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.
cumulative	<p>A combination of effects. The EIA Scope and Methodology Report for HS2 Phase 2b defines a cumulative effect as:</p> <p>"incremental effects that result from the accumulation of a number of individual effects. They may result either from:</p> <ul style="list-style-type: none"> - a combination of effects arising from the Proposed Scheme (intra-project effects). For example, intra-project effects may arise during construction in cases where the occupiers of residential properties experience noise, visual and traffic effects, resulting from construction activities or the passage of construction vehicles on the local road network; or - an interaction between the effects of the Proposed Scheme with the effects of other developments that are likely to be under construction or to have been completed during construction or operation of the Proposed Scheme (inter-project effects). For example, construction of the Proposed Scheme and Phase One and Phase 2a may give rise to inter-project effects at the interfaces between the two schemes)".
decibel	A unit used to express relative differences in sound power or intensity. There is a million to one ratio in sound pressure (measured in Pascal (Pa)) between the quietest audible sound and the loudest tolerable sound. The decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement because of this wide range. Audibility of sound covers a range of approximately 0-140dB.
Defra	The Government Department for Environment, Food and Rural Affairs. The department is responsible for safeguarding the natural environment, supporting the food and farming industry and sustaining a thriving rural economy.
delay (traffic)	An increase in journey time for drivers and passengers due to increased congestion.
Department for Transport	Government department responsible for transport matters in the UK (where powers have not been devolved).

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Term	Definition
dewatering	Removal or draining of groundwater from soils, superficial deposits or bedrock, typically by pumping, gravity drainage and/or compression.
diaphragm walls	Embedded walls inserted into the ground. They can be used as foundation walls, groundwater barriers or to isolate areas of contaminated ground.
diffusion tube	A passive device used in air quality monitoring to measure weekly or monthly average pollutant concentrations.
disamenity dust	Coarse dust particles that can reduce amenity in the local community due to visible dust plumes and dust soiling.
discharge consent	Permission granted by the Environment Agency to discharge material, such as sewage, trade effluent or excess rainwater, directly into surface waters, groundwater or the sea.
diversion	Used throughout this Environmental Statement to refer to a significant change to the route or direction of a road due to the location of the route of the Proposed Scheme. (See also: 'realignment').
droughtiness	A physical limitation to the agricultural use of soils. It is a defined calculation in the Agricultural Land Classification guidelines which uses soil and climatic parameters to provide an estimate of likely moisture stress in 'representative' crops. Moisture stress can arise when the crop's requirements for water exceed the available water capacity of the soil.
dust	All airborne particulate matter.
earthworks	The removal or placement of soils and other excavated material (e.g. rocks), such as in cuttings, embankments and environmental mitigation.
ecological status	The state of a water body, derived from a number of factors, including: the abundance of aquatic flora and fauna; nutrient availability; salinity; temperature; and chemical pollution levels.
ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
ecosystem services	The benefits that people derive from the natural environment. The natural environment can be considered as a stock of 'natural capital' from which many benefits flow - social, health-related, cultural or economic.
effect	Used throughout this Environmental Statement to refer to the consequence of an impact to the receiving environment (see also: 'impact').
effluent	Liquid waste or sewage.

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Term	Definition
electromagnetic field	The field of force associated with electric charge in motion, which has both electric and magnetic components and contains electromagnetic energy.
electromagnetic interference	Disturbance that affects an electrical system due to magnetic and electric fields, electromagnetic induction or electromagnetic radiation emitted from an external source.
embankment	Artificially raised ground, commonly made of rock or compacted soil, on which a new railway or road is constructed.
employment rate	The proportion of 16-64 year-old residents in employment. Employment comprises the proportion of the total resident population who are 'in employment' and includes full-time students who are employed.
enhancement	Improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which is unrelated to a negative impact or is 'over and above' that required to mitigate/compensate for an impact.
Environment Agency	An executive non-departmental public body, sponsored by the Government Department for Environment, Food & Rural Affairs, which has core responsibilities for the protection and enhancement of the environment in England.
environmental impact assessment	A process of systematically assessing the likely environmental effects of proposed development projects. An EIA must fulfil the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/571) (the 'EIA Regulations 2017'), which reflect the European Union (EU) EIA Directive (2014/52/EU) (the 'EIA Directive 2014') requirements for assessment of the effects of certain public and private projects on the environment The Environmental Impact Assessment (Scotland) Regulations 2017 transpose the EIA Directive, as amended, into the Scottish planning system. There is no substantive difference between the two Regulations as they both transpose the EIA Directive. An EIA is reported in a suite of documents known as an Environmental Statement. In the case of hybrid Bills, Private Business Standing Order 27A of the Houses of Parliament requires that the hybrid Bill is accompanied by a set of supporting documents, including an Environmental Statement describing the likely significant effects of the Proposed Scheme on people and the environment together with a report on the reasonable alternatives studied.
Environmental Statement	A suite of documents produced as part of an environmental impact assessment. It must include all information that is reasonably required to assess the likely significant environmental effects of a proposed development.

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Environmental Stewardship and Countryside Stewardship	A scheme run by the Department for Environment, Food, and Rural Affairs in England that aims to promote responsible use and protection of the natural environment through conservation and sustainable practices. This is a type of agri-environment scheme.
equality impact assessment	A predictive assessment of the possible equality effects of the Proposed Scheme on protected characteristic groups during construction and operation.
equivalent continuous sound pressure level, LpAeq,T	An index used internationally for the assessment of environmental sound impacts. It is defined as the notional unchanging level that would, over a given period of time (T), deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating sound levels can be described in terms of an equivalent single figure value.
eutrophic	Eutrophic standing waters are characterised by high levels of nutrients, either naturally or as a result of artificial enrichment. Although often highly productive, diversity is low and they are frequently dominated by extensive mats of algae. Consequently, oxygen levels are low, and light penetration is frequently restricted.
excavated material	Soil, rock and other material that has been removed from the ground during construction.
façade sound/noise level	The predictions and measurements of sound/noise levels 1m from the building, including an allowance for the sound reflected from the façade to the sound/noise prediction location.
fen	A low and marshy or frequently flooded area of land.
fill	Material used to artificially raise existing ground levels.
Flood Zones 1, 2 and 3	A system devised by the Environment Agency to aid decision-making in spatial planning. Flood zones are areas at potential risk of flooding from rivers or the sea, ignoring the presence of flood defences and the potential impacts of climate change. The zones are: <ul style="list-style-type: none"> - Flood Zone 1: land outside the floodplain. There is little or no risk of flooding in this zone; - Flood Zone 2: the area of the floodplain where there is a low to medium flood risk; and - Flood Zone 3: the area of the floodplain where there is a high risk of flooding.
floodplain	Land adjacent to a watercourse that is subject to flooding.
flush	An area where water from underground flows out onto the surface to create an area of saturated ground.
footfall	The total number of pedestrians walking past a specific point (in either direction) within a period of time.
footpath	A public right of way that the public can travel on by foot. These are often unpaved waymarked paths running through the countryside.

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footway	A path that runs alongside a road that the public can travel on by foot, often paved in more urban areas, but can also include unpaved routes on roadside grass verges.
fragmentation (ecology)	The breaking up of a habitat, ecosystem or land-use type into smaller parcels with the consequent impairment of ecological function.
freeboard allowance	The height from the maximum design level of a watercourse to: <ul style="list-style-type: none"> - the adjacent banks of an open channel, to provide a factor of safety against flooding; or - the soffit (underside) of any culvert or bridge above, to reduce the risk of blockage by floating debris, etc.
free-field sound/noise levels	A sound pressure level measured at a position more than 3.5m from all sound-reflecting surfaces (other than the ground) or predicted at a building in the absence of a correction for the sound reflected from the building façade.
Fruin Level of Service (LoS)	The Level of Service (LoS) criteria devised by John J Fruin uses six categories (LoS A to F) of pedestrian density. These categorise how, as the number of people within a given area increases, pedestrians' experience and the functional performance of the space decreases. At LoS A people can move freely or stand in comfort; at LoS F it is not possible to move and standing is at particularly high densities.
future baseline	The situation that would prevail if the proposed development that is the subject of the environmental impact assessment does not proceed. The predicted impacts of the development are compared against this theoretical scenario.
gazetteer	A dictionary that lists geographical features such as road names, hills, rivers and places.
GEH	GEH (please see Section 2.1 for abbreviation definition), or the GEH statistic, is a formula used in traffic engineering, traffic forecasting, and traffic modelling to compare two sets of traffic volumes.
geophysical survey	The collection of information associated with subsurface features (e.g. buried archaeology) using various techniques (such as magnetometer-a survey technique used to detect and map changes in the earth's magnetic field caused by concentrations of ferrous-based minerals within soils and subsoil, and buried materials). They enable the identification and survey of subsurface features without having to excavate.
glacial deposits	Natural materials laid down during the ice ages (i.e. of the Quaternary period).
glacial till	An unsorted glacial sediment deposited directly by a glacier.

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Term	Definition
glaciofluvial deposits	Natural materials relating to, or coming from, streams deriving much or all of their water from the melting of a glacier or ice sheet.
Grade 1 (Agricultural Land Classification) (England)	'Excellent' quality agricultural land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown, commonly including top fruit, soft fruit, salad crops and winter-harvested vegetables. Yields are high and less variable than on land of lower quality.
Grade 2 (Agricultural Land Classification) (England)	'Very good' quality agricultural land with minor limitations that affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown. However, on some land in the grade there may be reduced flexibility due to difficulties with the production of more demanding crops, such as winter-harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
Grade I listed building (England)	A listed building of exceptional interest, sometimes considered to be internationally important. Grade I listed buildings are of more importance than Grade II* listed and Grade II listed buildings.
Grade II listed building (England)	A listed building of special interest.
green belt	A designation for land around certain cities and large built-up areas, which aims to keep this land permanently open or largely undeveloped.
green bridges	Green bridges are typically footbridges, road bridges or agricultural access bridges which have been adapted to allow wildlife to safely cross the route of the Proposed Scheme.
green infrastructure	A network of high quality, multifunctional green space, both urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities.
green spaces	Areas of natural or semi-natural land such as parks, gardens and woodlands.
greenhouse gas	A gas such as carbon dioxide, methane, nitrous oxide, tropospheric ozone, chlorofluorocarbons, hydrochlorofluorocarbons or sulphur hexafluoride that contributes to the greenhouse effect by absorbing infrared radiation.
gross domestic product	Measure of the total economic activity in a country.
ground gas	Gases such as carbon dioxide and methane that are generated within the ground and/or within landfills (commonly from the breakdown of vegetative matter).
ground-borne noise	Vibration generated by moving vehicles (e.g. trains) in tunnels. Passing through the ground, it propagates into buildings where it causes building elements to vibrate, causing noise to be radiated inside a building.

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ground-borne sound	Sound generated inside a building by ground-borne vibration.
ground-borne vibration	Ground or building element vibration caused by vibration propagating through the ground from a source.
groundwater	All water that is below the surface of the ground and within the permanently saturated zone.
groundwater body	A distinct volume of groundwater within an aquifer.
groundwater dependent terrestrial ecosystems	Ecosystems that directly depend upon groundwater to maintain their form and function.
groundwater source protection zone	A defined area around an abstraction point, within which groundwater is extracted for potable water supply. The area is defined by the Environment Agency on the basis of the length of time taken for groundwater to migrate from a point below the water table to the abstraction point.
habitat	The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.
habitat regulations assessment	An assessment of projects (or plans) potentially affecting European sites in the UK, required under the Habitats Directive and Regulations.
Habitat Suitability Index	A numerical index used to evaluate habitat quality and quantity for a particular species. A value of one represents optimum habitat and a value of zero represents a habitat of no value.
hazardous waste	The Waste Framework Directive (2008/98/EC) defines hazardous waste as waste possessing one or more of the 15 hazardous properties set out in Annex III of the directive. These properties include being explosive, oxidizing, highly flammable, an irritant etc.
headhouse	The above-ground structure that typically sits at the top of a ventilation shaft or tunnel portal. These structures can be used for housing control equipment or for providing emergency access to tunnels.
heavy goods vehicle	A motor vehicle with a gross weight over 3.5 tonnes that is used to transport goods including construction material. In most cases in the construction of the Proposed Scheme, these are over 7.5 tonnes gross weight.
heavy metals	A loosely defined term which refers to a group of metals and metalloids, many of which are toxic to some degree.
hedgebank	A rubble or earth bank with bushy shrubs on top to form a hedgerow.
heritage asset (England)/historic asset (Scotland)	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated

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	heritage assets and assets identified by the local planning authority (including local listings).
High Speed Two	Proposed high speed rail line network connecting major cities in Britain.
High Speed Two Limited	The company set up by the Government to develop proposals for a new high speed railway line between London and the West Midlands and to consider the case for new high speed rail services linking London, northern England and Scotland.
Historic England	Executive non-departmental public body, sponsored by the Department for Digital, Culture, Media, and Sport, which has core responsibilities in the protection and enhancement of the historic environment of England and helps people understand, value and care for historic places.
historic landscape characterisation (England)	Mapping the present day landscape to establish how it has been shaped by the past. Rather than focusing on particular designated sites, this technique focusses on the wider landscape in general to get an understanding of historical value. This method can help to identify areas that should be conserved and protected. Equivalent to historic land-use assessment in Scotland.
horizontal fan	Fans used in tunnels to optimise the vertical configuration of vent shafts.
hybrid Bill	Hybrid Bills mix the characteristics of public and private bills. The provisions in a hybrid Bill would affect the general public, but would also have particular effects on specific individuals or groups.
hydraulic capacity	The maximum volume of water that can physically flow through a defined area.
hydraulic gradient	The slope of the water table between two or more points.
hydrocarbons	Compounds of carbon and hydrogen are called hydrocarbons. For example, methane, ethane.
hydrogeology	The nature, distribution and movement of groundwater in soils and rocks, including in aquifers.
hydromorphology	The physical characteristics of the shape, boundaries and content of a water body.
impact	Used throughout this Environmental Statement to refer to changes to the environment that have the potential to occur as a result of the construction and/or operation of the Proposed Scheme. (See also: 'effect'.)
Impact Risk Zone	A tool developed by Natural England to make a rapid initial assessment of the potential risks to Sites of Special Scientific Interest (SSSI) posed by development proposals.
important hedgerow	A hedgerow that is at least 30 years old and meets criteria set out in the Hedgerow Regulations 1997

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Term	Definition
	(includes both ecological and historic environment criteria).
in-combination climate change effects	The combined significant effects of the Proposed Scheme and potential climate change impacts on the receiving environment and community.
in-combination effects	A combination of environmental effects on community or business establishments (e.g. from sound, noise and vibration; dust and air quality).
inert waste	Defined in Article 2(e) of the EU Landfill Directive (1999/31/EC) as waste that does not undergo significant physical, chemical or biological transformations.
infrastructure maintenance base – rail	A permanent facility for maintenance trains servicing the HS2 railway, once operational.
inorganic (contaminant)	Contaminants comprised primarily of metals, metal compounds, certain minerals, acids and alkalis.
interchange	A point where people travelling either transfer between the same transport mode (for example, rail to rail), or from one transport mode to another (for example, from bus to rail).
interoperability	The ability of trains to operate across the European high speed network.
landscape	Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. It reflects the interplay of the physical, natural and cultural elements of our surroundings and the way that people perceive these interactions. Different combinations of these elements create the distinctive character of landscapes in different places.
Landscape Character Area	Areas of landscape that have a broadly consistent pattern of topography, land use and vegetation cover.
leachate	Any liquid that, in the course of passing through a solid material, extracts soluble or suspended solids, or any other component of the material through which it has passed.
leaching	Extraction of soluble or suspended material from a solid material when a liquid passes through it.
LiDAR	Light detection and ranging (LiDAR) is a high resolution remote sensing technology which uses a laser to measure distance between a satellite, aerial, terrestrial or mobile source and the ground, buildings and vegetation to create a three-dimensional model.
light goods vehicle	A motor vehicle used to carry goods with a total gross weight of up to 3.5 tonnes.
lightspill	The spilling of light beyond the boundary of the area being lit.

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Term	Definition
listed building	A building of special architectural or historic interest, listed pursuant to the Planning (Listed Buildings and Conservation Areas) Act 1990 or the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997, and the Enterprise and Regulatory Reform Act 2013. Listed buildings are graded I, II* or II in England and Category A, B or C in Scotland with Grade I and Class A being the highest. Listings include the interior, exterior and the setting of the building.
local planning authority	The local authority or council that is empowered by law to exercise planning functions.
Local Wildlife Site	A non-statutory site of nature conservation value that has been designated 'locally'. These sites are referred to differently between counties. Common terms including Site of Importance for Nature Conservation, County Wildlife Site, Site of Biological Importance, Site of Local Importance and Sites of Metropolitan Importance.
LpA10,T	The A-weighted sound pressure level that is exceeded for 10% of a given time interval, T, measured using the fast time-weighting. It is generally used to describe road traffic noise.
LpAeq,T	See 'equivalent continuous sound pressure level'.
LpASmax, T, LpAFmax, T	The maximum A-weighted sound pressure level attained during a given time interval, T. It is normally measured using slow or fast (F) time-weighting. With F weighting it is generally used when assessing the likelihood of night-time sleep disturbance from airborne noise events. With S weighting it is generally used in the measurement and assessment of ground-borne noise from railways.
made ground	Land where natural and undisturbed soils have been replaced or combined with man-made or artificial materials. It may be composed of a variety of materials including imported natural soils and rocks with or without residues of industrial processes (such as ash) or demolition material (such as crushed brick or concrete).
Manchester Metrolink	A tram system network owned by Transport for Greater Manchester, which connects major railway stations and other destinations within the Greater Manchester area.
Manning's n	A coefficient which represents the roughness or friction applied to the flow by the channel - the higher the value, the higher the friction
medieval period	The period between 1066 AD and 1540 AD.
mere	A shallow lake, pond or wetland.
Mesolithic period	The period between 10,000 - 4,000 BC.
mesotrophic	Mesotrophic lakes are characterised by having a narrow range of nutrients. Largely confined to the margins of upland areas in the north and west of England.

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Term	Definition
metapopulation	A group of spatially separated populations of the same species which interact at some level.
mire	A wetland area or ecosystem based on peat.
mitigation	The proposed means to avoid, prevent or reduce the likely adverse effects of development on the environment.
modal (mode) shift	A shift from one transport type to another, e.g. from road travel to rail travel.
mode share	The proportion of passengers travelling to/from a station by, for example, car, taxi, bus, and cycle.
Monin-Obukhov length	The Monin-Obukhov length is a parameter describing the stability of the atmosphere.
national grid	The high-voltage electricity transmission network in the UK.
National Highways (formerly known as Highways England until August 2021)	The Government company that operates, maintains and improves England's Strategic Road Network comprising all motorways and major A roads.
National Nature Reserve	Sites of national importance that are designated by Natural England as key places for wildlife and natural features in England.
National Trust (England) and National Trust for Scotland (Scotland)	Conservation charities protecting historic places and gardens and areas of countryside.
National Vegetation Classification	A comprehensive classification and description of the plant communities of Britain, administered by the Joint Nature Conservation Committee.
National Vocational Qualification	A qualification in a vocational subject set at various levels. For example, levels two and three correspond to GCSE and A-level respectively.
Natural England	Executive non-departmental public body constituted under the Natural Environment and Rural Communities Act 2006 (Section 2(1)) to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.
neighbourhood quality	A combination of aspects that have the potential to affect residents' experience of and feelings about their local environment.
Neolithic period	The period between 4,000 and 2,200 BC.
net	After all deductions have been made.
Network Rail	The not-for-dividend owner and operator of Britain's railway infrastructure. Network Rail runs, maintains and develops Britain's rail tracks, signalling, bridges, tunnels, level crossings and many key stations.

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Term	Definition
nitrogen dioxide	A gas produced when fuels are burned and is often present in motor vehicle and boiler exhaust fumes. It is an irritant to the respiratory system.
nitrogen oxides	A group of chemical compounds consisting only of nitrogen and oxygen which may be interconverted in the atmosphere. The principal oxides of nitrogen are nitric oxide and nitrogen dioxide.
noise barrier	A solid construction that reduces unwanted sound. It may take many forms including: engineering cutting; retaining wall; noise fence barrier; landscape earthworks; barrier on a viaduct; a parapet barrier on a viaduct; or any combination of these measures.
nominated undertaker	The body or bodies appointed to implement the powers of the hybrid Bill to construct and maintain the Proposed Scheme.
non-hazardous waste	Any waste not defined as 'hazardous' under Directive 91/689/EEC. Examples include soils from ground/site clearance and demolition wastes.
non-motorised user	Pedestrians, cyclists and horse riders (equestrians). These are also referred to as 'vulnerable road users'.
non-technical summary	A report that briefly describes the main points discussed in an Environmental Statement without using technical language.
Northern Powerhouse	A Government initiative aimed at attracting investment to towns and cities in the north of England.
Northern Powerhouse Rail	The Government and Transport for the North's vision for a strategic rail programme that will significantly improve the capacity, frequency and journey time of rail links between the main economic centres in the North of England.
offline	Not connected or currently in use. Also used in engineering in relation to railways, roads, pipelines etc. to denote a route (or a structure on a route, such as a bridge) away from the original alignment.
off-route effects	Effects of the Proposed Scheme that are in locations outside the route corridor.
oligotrophic	Oligotrophic lakes usually occur on hard, acid rocks, most often in the uplands, and are characterised by low nutrient levels, low productivity and clear water. Good examples may support some of the least disturbed aquatic assemblages in the UK.
ordnance datum	The height above mean sea-level, taken from a reference point at Newlyn, Cornwall. This is the national height system for Britain.
Ordnance Survey	The national mapping agency for Britain.
organic (contaminant)	Carbon-based contaminants, for example oils, tars and solvents.
Organotin	Any organic compound containing at least one tin to carbon (Sn-C) bond.

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Term	Definition
original scheme	The Bill scheme submitted to Parliament in January 2022, which was assessed in the main ES. See also 'Proposed Scheme'.
Overbridge	A bridge crossing over a transport corridor such as a railway line.
overhead catenary system	General term used to describe all the overhead line equipment in the rail corridor.
overhead line equipment	Electric wires suspended over the track, supplying traction power to trains.
pantograph	A device that is attached to the roof of an electric train to collect power through contact with the overhead catenary wire.
parapets	A low wall along the edge of a structure (e.g. a bridge), to protect people from falling.
particulate matter	Discrete particles in ambient air, with diameters ranging between nanometres (billionths of a metre) to micrometres (millionths of a metre).
passive provision	The delivery of HS2 infrastructure that provides allowance for non-HS2 infrastructure to be delivered at a future date.
pathways (pollution)	The routes by which pollutants are transmitted through air, water, soils, plants and organisms to their receptors.
peak particle velocity	The maximum velocity that is recorded during a particular vibration event. It is commonly used to assess the potential for damage to structures due to ground-borne vibration.
peat	A partially decomposed superficial deposit comprising of a mass of semi-carbonised vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.
permissive path	A path that is not a public right of way, but which the landowner permits the public to use. The landowner can close the path for periods of time.
Permo-Triassic	The period spanning the boundary between the late Permian and early Triassic geological periods.
Phase 1 Habitat Survey	A habitat classification and field survey technique to record semi-natural vegetation and other wildlife habitats.
Phase 2a	The section of the Phase Two route between the West Midlands and Crewe. It will include a connection with Phase One at Fradley, to the north-east of Lichfield, and a connection with the West Coast Main Line south of Crewe.
Phase 2b (or Phase 2b Western Leg)	The section of the Phase Two route from Crewe to Manchester, including stations at Manchester Airport and Manchester Piccadilly, a connection onto the West Coast Main Line north of Crewe and a number of works required beyond the route corridors, such as to the existing conventional rail network."

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Term	Definition
Phase One	Phase One of the proposed HS2 network, a high speed railway between London and the West Midlands with a connection via the West Coast Main Line at conventional speeds to the North West and Scotland. Phase One includes stations at London Euston, Old Oak Common (West London), Birmingham Interchange (near the National Exhibition Centre and Birmingham Airport) and Curzon Street (Birmingham city centre).
Phase Two	Phase Two of the proposed HS2 network to extend the high speed railway beyond the West Midlands to Manchester and other northern cities, including via connections with the conventional rail network.
photomontage	The process and result of inserting an image of the Proposed Scheme onto a photograph to show how existing views could be changed by the Proposed Scheme.
pier	A vertical loadbearing structure, which supports adjacent ends of bridge or viaduct spans.
piling	Driving and embedding piles of wood, concrete or steel deep into the ground, to support buildings/structures at the foundation level.
PM ₁₀	Any particulate matter with an aerodynamic diameter equal to or less than 10 micrometres.
PM _{2.5}	Any particulate matter with an aerodynamic diameter equal to or less than 2.5 micrometres.
ponding	The collection of standing water at the ground surface due to the presence of an impermeable layer within the soil.
porous (tunnel) portal	Perforated structures at tunnel portals (entrances), usually formed of concrete, designed to allow the passage of air from the tunnel. These reduce both air pressure changes and the noise generated when a high speed train enters a tunnel.
post-medieval period	The period between 1540 AD and 1901 AD.
powers (legal)	The right, ability or authority to perform an act.
Principal aquifer	A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage and transmission. They may support water supply and/or river base flow on a strategic scale and are considered by the Environment Agency to be critical to existing or future water supplies. In most cases, Principal aquifers are aquifers previously designated as major aquifers.
priority controlled junction	A highway junction where the traffic flow on one or more minor roads gives way to traffic on the main road, such as a "T" junction.

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Term	Definition
Proposed Scheme	The scheme which is the subject of the High Speed Rail (Crewe – Manchester) hybrid Bill. It includes the section of Phase 2b from Crewe to Manchester, with new stations at Manchester Airport and Manchester Piccadilly, a connection onto the West Coast Main Line and a number of works required beyond the route corridor, such as to the existing conventional rail network.
public realm	Outdoor areas, other than highways, accessible to the public in towns and cities.
public right of way	A highway where the public has the right to walk; and, depending on its class, use for other modes of travel. It can be a footpath (used for walking only), a bridleway (used for walking, riding a horse and cycling), a restricted byway (as a bridleway, but use by non-motorised vehicles also permitted) or a byway that is open to all traffic (including motor vehicles).
pylon	A tall lattice-like structure (usually made of steel) which is used to support overhead power lines. Also known as an electricity transmission tower.
Quarry	All areas where minerals have been or are being extracted from the surface. For example, sand and gravel quarries, rock quarries etc.
Quaternary	The most recent period of geological time, approximately equated to the last 2.6 million years.
radial route	A radial route is one of a series of highway routes arranged like the radii of a circle, spreading or leading outwards from a town or city centre.
Railhead	A site at locations along the route with connections to the National Rail network. They will be used as the delivery location for bulk rail-borne materials, such as ballast, rails and sleepers.
railway chainage	The distance measured along the centre of the railway line from one point to another.
railway corridor	The area in which the railway tracks are located. In the case of HS2, this corridor will in general include two tracks, overhead line equipment, track drainage, electricity cables, lineside paths and ducting for fibre optic communications.
Ramsar site	Wetland sites that are of international importance, as designated under Article 2(1) of the Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 2 February 1971. UN Treaty Series No. 14583.
realignment	Used throughout this Environmental Statement to refer to a slight change to the route or direction of a road due to the location of the route of the Proposed Scheme. (See also: 'diversion').

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Term	Definition
Receptor	A component of the natural or built environment (such as a human being, water, air, a building, an animal or a plant) affected by an impact of the construction and/or operation of a proposed development.
reinstatement	Returning a route to its former alignment following a temporary diversion.
remediation	The process of treating or managing contamination in the ground or groundwater to make land suitable for use.
replacement flood storage area	An area of low-lying land designed to temporarily fill with flood water to replace an area of existing floodplain lost due to development.
residual effects	Effects to an environmental receptor following the implementation of mitigation proposals.
residual impacts	Those impacts of the development that cannot be mitigated following implementation of mitigation proposals.
resource	Resources are residential dwellings, community facilities and infrastructure such as educational and health facilities, emergency services, places of worship, sports and recreational facilities, open spaces, and public rights of way.
restoration (ecology)	The re-establishment of a damaged or degraded system or habitat to a level similar to its original condition.
restoration (ground)	The works delivered following completion of excavation, including regrading of excavations, the placement and preparation of soils, and landscape treatment.
retained cutting	A cutting constructed with additional structural support that allows a steeper overall slope gradient than would otherwise be possible. This may be a partially retained cutting, which would include an element of naturally supported slope (usually above the retained element) or a fully retained cutting, which usually has vertical sides.
riparian area	The interface between land and a river or stream.
risk assessment	A systematic process of evaluating potential risks that may be involved in construction and operation of the Proposed Scheme.
river basin management plan	Plans developed under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 setting out environmental objectives for all groundwater and surface water bodies and protected areas within a river basin district.
rolling stock	Passenger or freight vehicles that operate on a railway.
rolling stock depot	An operational and maintenance hub within which train stabling, servicing (including interior and exterior cleaning) and light and heavy maintenance would take place.

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Term	Definition
route-wide effects	Effects of the Proposed Scheme that may occur at a geographical scale greater than the community area level.
ruderal species	A plant that is able to grow despite poor soil quality or limited soil cover. It is often the first to colonise previously disturbed land.
ruderal vegetation	Vegetation that is able to grow despite poor soil quality or limited soil cover. It is often the first to colonise previously disturbed land.
runoff	The flow of water over the surface of the ground.
sand	Soil particles from 0.06mm-2.0mm in equivalent diameter. Fine sand particles are from 0.06mm-0.2mm; medium sand from 0.2mm-0.6mm; and coarse sand from 0.6mm-2.0mm.
satellite compound	A compound that is smaller in size than the main compounds. Satellite compounds provide office accommodation for limited numbers of staff involved in the construction of the Proposed Scheme. Welfare facilities for staff are also provided.
scheduled monument	Nationally significant heritage assets protected by the Ancient Monuments and Archaeological Areas Act 1979 in England, Wales and Scotland.
scoping	An initial stage in the environmental impact assessment process to determine the nature and potential scale of environmental effects arising as a result of a proposed development, and an assessment of what further studies are required to establish their potential environmental impacts and effects. This will often include the identification of the proposed methodologies for the further studies.
Scottish Ancient Woodland Inventory	A map-based tool that shows the location of valuable woodlands in Scotland, including ancient woodland.
Scottish Environment Protection Agency	A non-departmental public body of the Scottish Government constituted under the Environment Act 1995. Scotland's principal environmental regulator, protecting and improving Scotland's environment.
screening	The first stage in an environmental impact assessment. It is used to determine if further assessment is necessary.
secant pile wall	A method of construction using interlocking piles. After a first set of primary piles are inserted, secondary piles are set using concrete to fill the space between the primary piles.
Secondary aquifer	There are two types of Secondary aquifer designation. 'Secondary A' are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. 'Secondary B' are predominantly lower permeability layers which may

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Term	Definition
	store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers. 'Secondary (Undifferentiated)' are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
sectioning auto-transformer station	A compound located next to a high speed railway that contains electrical equipment to provide distribution of power along the high speed railway. Used when larger sectioning equipment is required at an auto-transformer station to enable electrical sectioning of the railway.
severance	A change in ease of access for non-motorised users due to, for example, a change in travel distance or travel time or a change in traffic levels on a route that makes it harder for non-motorised users to cross it (traffic related severance). A reference to severance in this Environmental Statement does not necessarily imply that a route is closed to access.
siding	A section of track forming a branch off the main railway line. A siding can be used to store a train, or to allow trains to reverse and enter the main railway line running in the opposite direction from which they entered the siding.
signal controlled junction	A highway junction where the approach roads are controlled by traffic signals.
significant environmental effect	A term used to express the consequence of an impact, which is determined by correlating the magnitude of the impact to the importance, or sensitivity of the receptor or resource in accordance with the defined significance criteria, as described in the HS2 Phase 2b Environmental Impact Assessment Scope and Methodology Report.
silt	Soil particles from 0.002mm to less than 0.06mm in equivalent diameter.
site haul route	Temporary roads provided within the area of land required for construction to allow for the movement of construction material, construction machinery and/or construction workers between the construction compounds and work sites.
Site of Biological Importance	A non-statutory designation used by some local planning authorities to protect locally valued sites of biological diversity described as local wildlife sites by the UK Government.
Site of Importance for Nature Conservation	A site that supports locally important wildlife, also referred to as a local wildlife site. Many of these sites contain habitats and species that are priorities under the county or UK biodiversity action plans.

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Term	Definition
Site of Special Scientific Interest (England)	Area of land notified by Natural England under Section 28 of the Wildlife and Countryside Act 1981 as being of special interest due to its flora, fauna or geological or physiological features.
Site of Special Scientific Interest (Scotland)	A statutory designation made by Scottish Natural Heritage under the Nature Conservation (Scotland) Act 2004. Sites of Special Scientific Interest are those areas of land and water that Scottish Natural Heritage considers to best represent natural heritage - its diversity of plants, animals and habitats, rocks and landforms, or a combination of such natural features.
site waste management plan	The Site Waste Management Plans Regulations 2008 were repealed on 1 December 2013. The purpose of a site waste management plan was to identify opportunities to design out waste; as well as identifying the types and quantities of waste likely to be produced during construction of a project; the opportunities for sustainable management of the waste to be identified; and to monitor and report on the actual management of these wastes throughout the construction period.
site-fabric	A general term used to describe land and/or permanent structures present within a designated site boundary which are not, and never have been, part of the special interest of a site, nor do they contribute towards supporting a special interest feature of a site in any way, but which have been unavoidably included within a boundary for convenience or practical reasons. Areas of site-fabric will be deliberately excluded from condition assessment and will not be expected to make a contribution to the achievement of conservation objectives.
skyglow	The brightening of the night sky.
slab track	A type of railway track which uses either pre-cast or cast-in-situ concrete elements to support the track, instead of graded stone.
slowly permeable layer	A layer at least 15cm in thickness with the upper boundary within 80cm of the ground surface and with soils that impede the downward movement of excess rainfall.
social capital	The connections between the individuals within communities, and the inclination that arises through these networks for individuals to feel valued, to feel a sense of belonging, to have companionship and to tangibly support each other.
soil	The upper layer of the earth's crust, in which plants grow. It consists of weathered rock, organic matter, air spaces and water. Descriptions usually identify the relevant characteristics of its (usually) horizontal layers in terms of their significance for soil characteristics and crop growth, usually to a depth of 1.2m.

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Term	Definition
soil association	A group of related soil types or soil series developed from a similar geological parent material.
soil erosion	The detachment and movement of soil by the action of water and/or wind.
span	The horizontal distance between two supports of a structure (e.g. piers of a bridge or viaduct).
spur	A section of railway track connecting to the main line.
stabling	The parking of trains whilst out of operational service.
statutory consultee	Organisations and bodies that must be consulted on relevant planning matters, as defined by statute.
stockpile	An area where materials excavated during construction of the Proposed Scheme will be stored temporarily before being reused, or where construction plant and machinery associated with the construction is stored.
Strategic Road Network	The network of motorways and major trunk roads in England.
Subgrade 3a (Agricultural Land Classification) (England)	'Good' quality agricultural land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Subgrade 3b (Agricultural Land Classification) (England)	'Moderate' quality agricultural land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
subsoil	The weathered layer of soil between the natural topsoil at the ground surface and the unweathered rock below. Subsoil has a lower organic matter and plant nutrient content than topsoil. In some places there is an upper subsoil layer or horizon, which is transitional in texture between the topsoil and a lower subsoil.
Supplementary Environmental Statement 1 (SES1)	The SES1 provides additional information to that provided within the main ES. This additional information includes: <ul style="list-style-type: none"> - new and updated environmental baseline information; - changes to the design of the scheme that do not require amendments to the Bill powers and changes to construction assumptions and programme; and - corrections to information previously reported.
Supplementary Environmental Statement 1 (SES1) changes	All changes reported in the SES1 that do not require additional powers in the Bill. This may include new baseline information, changes to design and construction assumptions, and corrections.

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Term	Definition
Supplementary Environmental Statement 1 (SES1) design changes	Changes to the scheme design reported in the SES1 that do not require additional powers in the Bill.
Supplementary Environmental Statement 1 (SES1) scheme	The original scheme with the changes described in the SES1 that are within the existing powers of the Bill.
Supplementary Environmental Statement 2 (SES2)	The SES2 provides additional information to that provided within the main ES. This additional information includes: <ul style="list-style-type: none"> - new and updated environmental baseline information; - changes to the design of the scheme that do not require amendments to the Bill powers and changes to construction assumptions and programme; and - corrections to information previously reported.
Supplementary Environmental Statement 2 (SES2) changes	All changes reported in the SES2 that do not require additional powers in the Bill. This may include new baseline information, changes to design and construction assumptions, and corrections.
Supplementary Environmental Statement 2 (SES2) design changes	Changes to the scheme design reported in the SES2 that do not require additional powers in the Bill.
Supplementary Environmental Statement 2 (SES2) scheme	The original scheme with the changes described in the SES1 and SES2 that are within the existing powers of the Bill.
surface water	Waters including rivers, lakes, loughs, reservoirs, canals, streams, rainfall runoff, ditches, coastal waters and estuaries.
surface water flooding	Flooding caused by the volume of rainfall exceeding the capacity of either the drainage network, or rate that water can infiltrate into the ground, resulting in water that lies on or flows over the ground. Surface water flooding is not usually associated with a watercourse.
surplus excavated material	Excavated material becomes surplus if: its irrecoverable physical, chemical or biochemical quality prevents it from being used in the Proposed Scheme; there is more material than required for the Proposed Scheme or other permitted scheme; or the requirement for a type of material is too far away from the excavation point to make its use practicable.
sustainable drainage systems	Measures designed to control surface runoff close to its source, including management practices and control measures such as storage tanks, basins, swales, ponds and lakes. Sustainable drainage systems allow a gradual release of water and thereby reduce the potential for downstream flooding.
sustainable transport	Any type of transport that has lower impacts on the environment and is more fuel efficient than traditional travel by single occupancy private motor vehicle. This

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Term	Definition
	includes walking, cycling, public transport and car sharing.
tannery	A place where animal hides are tanned; the workshop of a tanner.
taxa (singular taxon)	A grouping of organisms of any rank according to a classification system, for instance species, family, or class.
through-about	A circular road junction with lanes of traffic running through the middle of it. Often signal controlled, these junction arrangements can improve the flow of traffic through a junction which would typically otherwise be served by a roundabout.
topography	The natural or artificial features, level and surface form of the ground surface.
topsoil	Upper layer of a soil profile, usually darker in colour (because of its higher content of organic matter) and more fertile than subsoil, and which is a product of natural biological and environmental processes.
townscape	The landscape within the built-up area, including the buildings, the relationship between them, the different types of urban open spaces, including green spaces and the relationship between buildings and open spaces.
trackout	The movement of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.
traction power	Power provided primarily for the purpose of moving trains.
traffickability	The capability of a soil to bear traffic (vehicles, livestock or people) without causing any physical damage to it or impairing its functions.
translocation	The transporting and release of species or habitats from one location to another. For example, if an area of land is required permanently for a new development, species can be moved from that site to a suitable alternative location.
Transport Analysis Guidance	Department for Transport guidance on the role of transport modelling and appraisal.
Transport for the North	The organisation formed to transform the transport system across the North of England, providing the infrastructure needed to drive economic growth.
Triassic period	The period between 251 million years ago and 200 million years ago.
tunnel boring machine	A tunnelling machine, which consists of a rotary cutting head that occupies the full face of the tunnel. A system of conveyors or pumps is used to remove the excavated material.

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Term	Definition
tunnel portal	Tunnel entrances and exits.
turnback	A facility that allows a train to reverse. A turnback can be a crossover on the main railway line, or a reversing siding, which branches off the main railway line.
turning head	An area of road or access to allow vehicles to turn back where temporary and permanent road closures as part of the construction and operation of the Proposed Scheme has created dead ends.
two-way trips	Two-way trips refer to the total number of vehicle movements in both directions (i.e. with 200 westbound vehicles and 100 eastbound, there would be 300 two-way trips).
underbridge	A bridge crossing under a transport corridor such as a railway line.
undercroft	An unenclosed area that occupies the area below the a building, usually accessed at street-level.
unemployment	Refers to people without a job who were available to start work in the two weeks following their interview and who had either looked for work in the four weeks prior to interview or were waiting to start a job they had already obtained.
unemployment rate	The proportion of residents unemployed and actively seeking employment as a percentage of the economically active population.
United Kingdom Climate Impacts Programme	Established in 1997 by the United Kingdom Government to coordinate and influence research into adapting to climate change, and to disseminate knowledge and tools for users to consider their climate risks and plan to adapt.
United Kingdom Climate Projections	The United Kingdom Climate Projections provide future projections of climate change for different time periods and different possible scenarios of greenhouse gas emissions. These illustrate a range of possible future changes to the United Kingdom's climate. The United Kingdom Climate Projections 2009 (UKCP09) have been superseded by a more recent suite of projections published in 2018. United Kingdom Climate Projections 2018 (UKCP18) are the most current climate projections for the UK.
utility	A commodity or service, such as electricity, gas or fuel that is provided by a public or private service provider. These are often delivered to customers via pipes, cables etc. under the ground. They can also be delivered above the ground, for example, via overhead power lines.
utility diversion	Utilities may be diverted, or have their height or depth altered, where their current alignment, either above or below ground, would prevent the construction of certain components of the Proposed Scheme.

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vehicle movement	A journey made by a vehicle that can either be a one-way or two-way trip.
ventilation (and intervention) shafts	Shafts located at intervals along the length of a tunnel and used for ventilation and emergency access/exit.
veteran tree	A tree that is of interest biologically, culturally or aesthetically because of its age, size or condition.
viaduct	A type of bridge composed of a series of spans, used to carry roads and railways across valleys or other infrastructure.
viaduct deck	The surface of the railway viaduct structure.
vibration dose value	Defined in BS6472-1(2008) as a relationship that yields a consistent assessment of vibration which correlates well with subjective response. It is used to estimate the probability of adverse comment expected from people experiencing vibration in buildings. Consideration is given to the time of day and use made of occupied space in buildings (e.g. residential, office or workshop).
viewpoint	A place from which something can be viewed.
visual amenity	The enjoyment or benefit that people derive from a particular view or area in terms of what is seen. When a landscape (or townscape) is changed in some way, the change will be seen by people - often by several different groups of people i.e. visual receptors - and this may affect their views and their visual amenity overall.
visual receptor	People who may have a view of the Proposed Scheme during construction or operation.
vulnerable road users	Defined in this Environmental Statement as all pedestrians, cyclists and equestrians.
waste	The Waste Framework Directive (Directive 2008/98/EC) defines waste as "... any substance or object which the holder discards or intends or is required to discard...".
Water Framework Directive surveys	A survey of surface water and groundwater bodies to establish their current condition or 'status or potential' as per the Water Framework Directive (as defined by EU Directive 2000/60/EC, and amended by subsequent regulations).
watercourse diversion	A route of a watercourse, where either the start or the finish point changes due to modification, which results in changes to the flow regime within a discrete section of channel.
watercourse realignment	The route of a watercourse, modified between two points, where the start and finish points remain the same.
wayleave	A right of way, over or through land, granted by a landowner.
wellbeing	A general term for the condition of an individual or group, for example their social, economic, psychological, spiritual or medical state. High wellbeing means that, in some sense, the individual or group's experience is

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Term	Definition
	positive, while low wellbeing is associated with negative conditions.
West Coast Main Line	Inter-urban rail line connecting London, Birmingham, Manchester, Liverpool and Glasgow.
wetness class	Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six wetness classes are identified, ranging from 'very well drained' to 'very poorly drained'.
wharf	A level quayside area to which a ship may be moored to load and unload.
Y network	Proposed network comprising a high speed rail line between London and the West Midlands, then splitting into two lines, one continuing to Manchester and the other to Leeds via the East Midlands.
zone of theoretical visibility	The likely (or theoretical) extent of visibility of a development, usually shown on a map.

2 Abbreviations

This section includes new units of measurement and abbreviations relevant to the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES).

2.1 Symbols and units of measurement

Abbreviation	Meaning
%	per cent
<	is less than
>	is more than
©	Copyright
µg/l	micrograms per litre
µg/m ³	micrograms per cubic metre
µm	Micrometre
µT	Microtesla
ASPT	average score per taxon
CH ₄	Methane
CLNmax	maximum critical load of nitrogen
cm	Centimetre
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
dB	Decibel
g/yr	grams per year
gCO ₂ e	grams of carbon dioxide equivalent
GHz	Gigahertz
ha	Hectare
Hr	Hour
k eq/ha/yr	kiloequivalent per hectare per year
kg	Kilograms
kgN/ha/yr	kilograms of nitrogen per hectare per year
km	Kilometre
km ²	square kilometres
kph	kilometres per hour
kV	Kilovolt
kWh	kilowatt hour
m	Metre
m/s	metres per second
m ³	square metres
m ³ /s	cubic metres per second (also known as cumecs)
mg L ⁻¹	milligrams per litre

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Abbreviation	Meaning
mg/l or mg L ⁻¹	milligrams per litre
mm	Millimetre
mm/s	millimetres per second
mph	miles per hour
N	Nitrogen
NH ₃	Ammonia
NO	nitrogen oxide
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
p/hr	per hour
pa	per annum
PM ₁₀	particulate matter (with aerodynamic diameter of less than 10 micrometres)
PM _{2.5}	particulate matter (with aerodynamic diameter of less than 2.5 micrometres)
PPMS	passengers per metre squared
PPV	peak particle velocity
RFC	ratio of flow to capacity (traffic and transport)
SO ₂	sulphur dioxide
t	Tonne
tCO ₂ e	metric tonne of carbon dioxide equivalent
V	Volt
vpd	vehicles per day
vph	vehicles per hour

2.2 Acronyms and initialisms

Abbreviation	Meaning
AADT	annual average daily traffic
AAWT	annual average weekday traffic
AC	alternating current
ADMS	atmospheric dispersion modelling system
ADT	articulated dump truck
AHA	Agricultural Holdings Act
ALARP	as low as reasonably practicable
AOD	above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AP	Additional Provision
AP1 ES	Additional Provision 1 Environmental Statement
AP2 ES	Additional Provision 2 Environmental Statement
APIS	Air Pollution Information System
APS	Annual Population Survey

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Abbreviation	Meaning
ATC	Air Traffic Control
ATFS	auto-transformer feeder station
AWI	Ancient Woodland Inventory
BAP	biodiversity action plan
BEIS	(Department for) Business, Energy and Industrial Strategy
BGS	British Geological Survey
BID	Background Information and Data
BMV	best and most versatile (agricultural land)
BRES	Business Register and Employment Survey
C&I	commercial and industrial
CA	community area
CC	climate change
CCI	Community Conservation Index
CDEW	construction, demolition and excavation waste
CDM	Construction (Design and Management) 2015 Regulations
CIRIA	Construction Industry Research and Information Association
CJEU	Court of Justice of the European Union
CoCP	Code of Construction Practice
COMAH	Control of Major Accident Hazards
CP	cathodic protection
CREAM	Calculator for Road Emissions of Ammonia
CSM	conceptual site model
CSM-RA	EU Regulation 402/2013 on the Common Safety Method on Risk Evaluation and Assessment (as amended by Regulation EU 2015/1136)
d/s	down stream
DB	dumb bell
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DoS	degree of saturation (traffic and transport)
eDNA	environmental DNA
EFM	Exogenous Forecasting Model
EFT	emissions factor toolkit
EIA	environmental impact assessment
EMC	electromagnetic compatibility
EMF	electromagnetic field
EMI	electromagnetic interference
EMR	environmental minimum requirements
EPUK	Environmental Protection UK

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Abbreviation	Meaning
EQS	Environmental Quality Standards
EU	European Union
EU ETS	European Union Emissions Trading Scheme
FBT	Farm Business Tenancy
FCT	favourable conditions table
FEH	Flood Estimation Handbook
FF	free flow
FIA	farm impact assessment
FISH	Forum on Information Standards in Archaeology
FRA	flood risk assessment
FSMS	Field Survey Methods and Standards
GDP	gross domestic product
GDPR	General Data Protection Regulation
GEH	Geoffrey E. Havers (please see glossary definition for 'GEH')
GHG	greenhouse gas
GIS	geographical information system
GMPTM	Greater Manchester Public Transport Model
GMSM	Greater Manchester Saturn Model
GMVDM	Greater Manchester Variable Demand Model
GSM-R	Global System for Mobile Communications – Railway
GWDE	groundwater dependent terrestrial ecosystem
GWML	Great Western Main Line
HAWRAT	Highways Agency Water Risk Assessment Tool
HDV	heavy duty vehicle
HER	historic environment record
HEWRAT	Highways England water risk assessment tool
HGV	heavy goods vehicle
HLC	Historic Landscape Character (England)
HLCA	Historic Landscape Character Area (England)
HoPI	habitat of principal importance
HOST	Hydrology of soil types
HRA	habitat regulations assessment
HS2	High Speed Two
HS2 Ltd	High Speed Two Limited
HSE	Health and Safety Executive
HSI	habitat suitability index
IAQM	Institute of Air Quality Management
IAT	impact assessment table
ICM	Integrated Catchment Model
ICNIRP	International Commission on Non-Ionizing Radiation Protection

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Abbreviation	Meaning
IMB-R	Infrastructure Maintenance Bases - rail
InSAR	Interferometric synthetic aperture radar
IRP	Integrated Rail Plan
IRZ	impact risk zone
JTC	junction turning count
LAQM	local air quality management
LCA	Landscape Character Area
LCT	Landscape Character Types
LDV	light duty vehicle
LEMP	local environmental management plans
LFRMS	local flood risk management strategy
LGS	Local Geological Site (formerly regionally important geological sites)
LGV	light goods vehicle
LiDAR	light detection and ranging
LIFE	Lotic-invertebrate Index for Flow Evaluation
LLFA	lead local flood authority
LMVR	Local Model Validation Report
LOAEL	lowest observed adverse effect level
LoD	limit of detection
LOD	limit of deviation
LpAeq	equivalent continuous A-weighted sound pressure level
LpAeq, day	equivalent continuous sound pressure level [day - 07:00-23:00]
LpAeq, night	equivalent continuous sound pressure level [night - 23:00-07:00]
LpAFmax	maximum A-weighted sound pressure level measured with a fast time constant
LpASmax	maximum A-weighted sound pressure level measured with a slow time constant
LRN	local road network
LTP	local transport plan
LV	low voltage
LWS	Local Wildlife Site
mAOD	metres above Ordnance Datum
MASH	Manchester Action on Street Health
M-BAT	metal bioavailability assessment tool
MCA	multi-criteria analysis
MCC	manual classified count (traffic and transport)
MPR	Model Performance Report
MSA	motorway service area
MTBE	methyl-tert butyl ether
N/A	not applicable

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Abbreviation	Meaning
NAEI	National Atmospheric Emissions Inventory
NCN	National Cycle Network
NERC	Natural England and Rural Communities
NFU	National Farmers Union
NGR	National Grid Reference
NHLC	National Historic Landscape Characterisation
NHLE	National Heritage List for England
NHS	National Health Service
NMR	National Monuments Record
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPR	Northern Powerhouse Rail
NPS	National Pond Survey
NTEM	National Trip End Model
NTM	National Transport Model
NTS	non-technical summary
NTS (traffic related)	National Travel Survey
NTSN	National Technical Specification Notices
NVC	National Vegetation Classification
NVQ	National Vocational Qualification
OCS	overhead catenary system
OGA	Oil & Gas Authority
OLE	overhead line equipment
OM	Operation and maintenance (note: used to code different risk events)
ONS	Office for National Statistics
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbons
PAS	Publicly Available Specification
PCB	Polychlorinated biphenyls
PCU	passenger car unit
PEDL	Petroleum Exploration and Development Licence
PFM (also referred to as PLANET)	Planet Framework Model (also referred to as PLANET - Planning network transport forecast model)
PFRA	preliminary flood risk assessment
PIA	personal injury accidents
PPE	Personal Protective Equipment
PPK	pence per kilometre
PPM	pence per minute
PPV	peak particle velocity
PRC	practical reserve capacity

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Abbreviation	Meaning
PROPWET	Index of proportion of time that soils are wet
PRoW	Public right of way
PSI	proportion of sediment-sensitive invertebrates
PSYM	Predictive System for Multimetrics
PYV	Present Year Validation
Q	Queue
RA	rapid assessment
RBD	river basin district
RBMP	river basin management plan
RED	Rail Expansion Device
ReFh2	Revitalised Flood Hydrograph 2
RFC	ratio of flow to capacity
RFS	Replacement Floodplain Storage
RICT	River Invertebrate Classification Tool
RNAG	reason for not achieving good status
RoFSW	risk of flooding from surface water
RSD	rolling stock depot
SAC	Special Area of Conservation
SAT	specific assemblage type
SATS	sectioning auto-transformer station
SBI	scientific biological importance
SBI	Site of Biological Importance
SCADA	supervisory control and data acquisition
SEPA	Scottish Environment Protection Agency
SER	Stop Equipment Room
SES	Supplementary Environmental Statement
SES1	Supplementary Environmental Statement 1
SES2	Supplementary Environmental Statement 2
SFRA	strategic flood risk assessment
SIP	site improvement plan
SMP	Smart Motorways Programme
SMR	Scope and Methodology Report
SO27A	Parliament's Private Business Standing Order 27A
SOAEL	significant observed adverse effect level
SPA	Special Protection Area
SPRHOST	Standard percentage runoff derived using the HOST soil classification
SPZ	Source Protection Zone
SRN	strategic road network
SSSI	Site of Special Scientific Interest
STM	SATURN transport model

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Abbreviation	Meaning
TA	Transport Assessment
TAG	Transport Analysis Guidance
TB	two bridge
TBM	tunnel boring machine
TEMPro	Trip End Model Presentation Program
TMP	traffic management plan
TSS	train service specification
TUFLOW	Two-dimensional hydraulic modelling software built by BMT WBM
TWAO	Transport and Works Act Order
UCR	Union Connectivity Review
uFMfSW	Updated Flood Map for Surface Water
UID	Unique gazetteer identifier
UK	United Kingdom
UK ETS	UK Emissions Trading System
UKAPIS	UK Air Pollution Information System
UKBC	UK Business Counts
UKCP	United Kingdom Climate Projections
UKCP09	United Kingdom Climate Projections 2009
UKCP18	United Kingdom Climate Projections 2018
VDV	vibration dose value
VOC	volatile organic compounds
VRS	vehicle restraint system
WCML	West Coast Main Line
WebTAG	Web Transport Analysis Guidance
WFD	Water Framework Directive
ZTV	Zone of theoretical visibility

3 References

This section includes all references relevant to the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES).

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