



**TfN Strategic Development Corridor Studies
West and Wales**

TfN

Environmental Appraisal Report

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Contents

1.	Introduction	1
1.1	Background	1
1.2	Purpose of the Environmental Appraisal Report	2
1.3	Structure of the Environmental Assessment Report	4
2.	Project Definition	5
2.1	Study Context.....	5
2.2	West and Wales Corridor	6
2.2.1	The Highway Network	7
2.2.2	The Rail Network	8
2.3	Environmental Assets.....	10
3.	Environmental Appraisal of the SPOC	11
3.1	Overview.....	11
3.1.1	Environmental Impact Appraisal.....	12
3.1.2	Inputs to the SPOC.....	12
3.1.3	Appraisal of Environmental Capital	14
3.1.4	Policy Appraisal	14
3.1.5	Integrated Sustainability Appraisal (ISA) Objectives Appraisal.....	14
3.2	Reference Case.....	15
3.3	Sub-corridors	16
3.4	Baseline Data Collection	17
3.5	Baseline Environmental Change	18
3.6	Environmental Policy Review	18
3.7	Limitations	18
4.	Strategic Outline Programme (SOP)	19
5.	Environmental Impact Appraisal	24
5.1	Inputs to Strategic Outline Case (SPOC)	24
5.1.1	Noise.....	24
5.1.2	Air Quality	25
5.1.3	Greenhouse Gases	26
5.2	Appraisal of Environmental Capital	27
5.2.1	Landscape	27
5.2.2	Townscape	28
5.2.3	Historic Environment	28
5.2.4	Biodiversity	29
5.2.5	Water Environment.....	30
6.	Environmental Policy Appraisal	31
7.	Integrated Sustainability Appraisal (ISA) Objectives Appraisal	33
7.1	ISA Objectives	33
7.2	Appraisal of SOP Against ISA Objectives	34
8.	Summary	38

9. Glossary 39

Appendices

1. Introduction

1.1 Background

This Environmental Assessment Report (EAR) has been produced for the West and Wales Strategic Development Corridor (SDC). It contains an environmental appraisal of schemes included within the Strategic Programme Outline Case (SPOC), and should be read in conjunction with the SPOC document. The purpose of the SDCs is to provide a Strategic Outline Programme (SOP) of schemes to 2050 for inclusion at a “Pan Northern” level within Transport for the North’s (TfN’s) Strategic Transport Plan (STP) Investment Programme. The TfN STP was published in February 2019, and is summarised alongside its supporting evidence base within Figure 2 overleaf.

TfN has a vision to significantly improve frequency, capacity, reliability, speed and resilience of Northern transport systems; the aim of such improvements is to create a globally competitive region which can sustain substantial economic growth for future decades. The outputs of the SDC commissions inform the Investment Programme that accompanies the Strategic Transport Plan (STP) and provides a pipeline of transport interventions that will be needed to support the future economy of the North between now and 2050. In parallel to the West and Wales SDC, there are four other concurrent SDC geographies forming a composite programme of investment opportunities at a Pan Northern level - Connecting the Energy Coasts, South Pennines / Yorkshire to Scotland, and the Central Pennines. Two further SDC Corridors will be completed during 2019, covering connectivity between the North West and the Sheffield City Region, as well as the East Coast to Scotland.

The SDC objectives are shown below in Table 1.

Table 1: Strategic Corridor Objectives

Number	Objective
1	To identify transport specific objectives, which support the delivery of TfN’s STP objectives
2	Identify a long-list of options that could meet the transport objectives, and undertake an assessment of the potential VfM, benefits and impacts of the different options using the WebTAG appraisal process. This will include an initial assessment of the interventions against the study specific objectives.
3	Short-list and sequence the appraised options to be carried forward.
4	Prepare inputs to the programme level business case for the appraised option(s) for further consideration in the development of road and rail investment plans.

Funding approvals for interventions within the SDC programmes will be sought through the UK public sector’s staged approach to major investment decisions as shown for transport projects in Figure 1.

Figure 1: The Three Phases of the Decision Making Process



The TfN SDC business cases have been developed to a level of detail approaching a conventional ‘single-scheme’ Strategic Outline Business Case (SOBC)¹, but greater than a Strategic Outline Programme (SOP). To distinguish them from these two documents defined in HM Treasury (HMT) and Department for Transport (DfT)

¹ DfT guidance uses SOBC whereas more recent Treasury guidance uses Strategic Outline Case (SPOC) for the equivalent development stage for interventions with a single approval

guidance, they have given the description of Strategic Programme Outline Case (SPOC), within which the SOP list of interventions has been incorporated.

1.2 Purpose of the Environmental Appraisal Report

The purpose of this EAR is to inform decision makers and stakeholders of the likely environmental implications of the SPOC proposed for the West and Wales SDC, and how environmental considerations have been considered.

The approach to transport appraisal outlined in the Department for Transport (DfT)'s WebTAG appraisal process ensures that the environment is considered throughout the development of transport interventions. This report outlines the methodology undertaken for the SPOC, (where the environmental topics outlined in the WebTAG guidance have been appraised qualitatively), and its outcomes.

In accordance with the requirements of the STP, further environmental appraisal has been undertaken. One of the STP's four pan-Northern transport objectives is to 'promote and support the built and natural environment'.

This objective state that the STP will:

- Promote measures that improve sustainable travel options and make best use of the North's existing
- strategic transport networks, including encouraging a modal shift from road transport;
- Promote and support low carbon growth using solutions that reduce carbon emissions and air quality impacts across the strategic road and rail networks; and
- Ensure that environmental and sustainability impacts are a key consideration in option selection for new strategic transport infrastructure interventions; and
- Ensure that improvements to the strategic transport network align with local environmental objectives and are in accordance with the National Planning Policy Framework.

The STP's environmental objective has been influenced by an Integrated Sustainability Appraisal (ISA)². This has ensured that environmental considerations, and sustainability more widely, are embedded throughout the STP to ensure TfN's Investment Programme develops and delivers sustainable future strategic transport interventions that assist and where possible enhance the environment of the North. It also serves to ensure that that potential significant effects arising from the STP are identified, assessed, and mitigated. The EAR provides an assessment of the SOP interventions against the ISA objectives, thereby ensuring consistency at the programme level. A policy appraisal has also been undertaken to support the requirement that STP interventions align with local environmental objectives and are in accordance with national policy.

This report sets out an approach to appraisal that is proportional to a SPOC at the programme level, and that reflects the needs of the WebTAG process and STP objectives. The report will outline how the environment has been considered in the development of the SOP and will provide an indication of any limitations of the appraisal process.

² Independent Integrated Sustainability Appraisal (2018)

Figure 2: The Strategic Transport Plan and its Evidence Base



Source: TfN's work programmes

1.3 Structure of the Environmental Assessment Report

The EAR comprises of eight Sections, including this Introduction:

- Section 2: Project Definition
- Section 3: Outline of Approach to the Environment
- Section 4: Strategic Outline Programme
- Section 5: Environmental Impact Appraisal
- Section 6: Policy Appraisal
- Section 7: Integrated Sustainability Appraisal (ISA) Objectives Appraisal
- Section 8: Summary

2. Project Definition

2.1 Study Context

The people of the North are at the heart of the TfN STP³. An effective, efficient Northern transport network is a fundamental part of everyday life – connecting people to jobs, health, education and leisure opportunities, connecting businesses to each other and allowing the efficient movement of goods and services. A transport system that is fit-for-purpose with strong north-south and east-west connections will be the backbone of a strong economy for the North and for the UK.

The STP has a horizon year of 2050 to align with the Northern Powerhouse Independent Economic Review (NPIER)⁴ and to enable the development of a long term transport investment programme for the North. This will mean that TfN and its Partners can work with Government to secure funding to deliver the right schemes in the right place at the right time, providing certainty for local transport authorities to plan complementary investment and also for the private sector to plan commercial investments. The pipeline of investment will give confidence to businesses across the North to invest and grow, give the supply chain, including Small and Medium Enterprises (SMEs), confidence to plan interventions, build up their skills base, and collaborate across industries.

Building on existing and proposed projects, the Strategic Development Corridors (SDCs) represent strategic geographical and economic areas with the strongest potential towards transformational growth in the North. Combining evidence from the 2017 Integrated Rail and Major Roads Reports, the STP identifies seven corridors (see Figure 3) where evidence indicates delivery of transformational growth is dependent on bringing forward major road and rail investment.

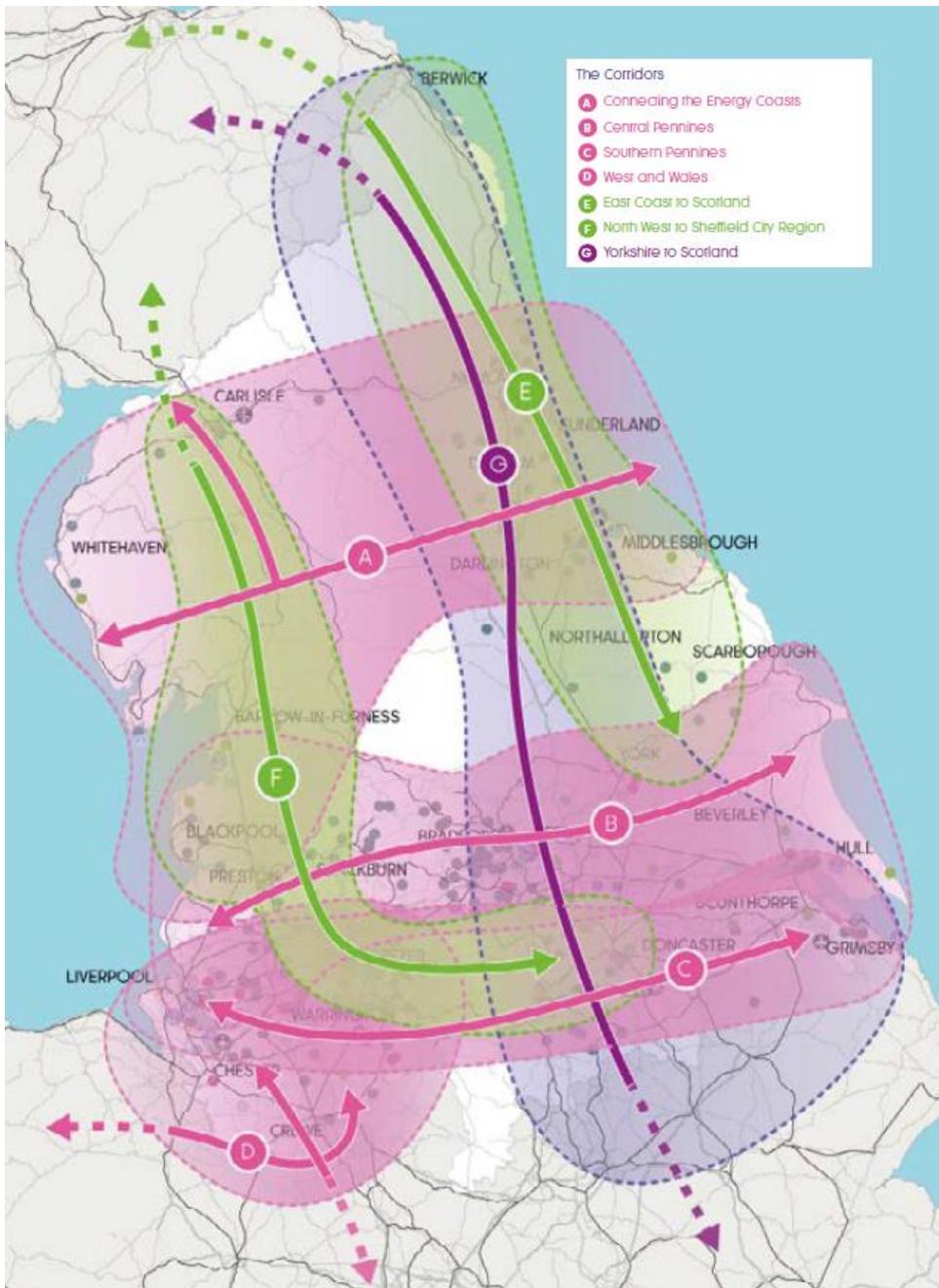
These corridors complement Northern Powerhouse Rail (NPR), Integrated and Smart Travel and three Strategic Road studies⁵, which form part of the reference case for this study. This study specifically seeks to explore the West and Wales Strategic Development Corridor (SDC).

³ Strategic Transport Plan for the North (Final)

⁴ <https://transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf>

⁵ Northern Trans Pennine Routes; Manchester North West Quadrant; Trans Pennine Tunnel

Figure 3: TfN Strategic Development Corridors



2.2 West and Wales Corridor

The West and Wales SDC covers the Liverpool and Manchester City regions, as well as Cheshire and North Wales. This corridor links densely populated economic centres and assets, including some of the North’s largest cities, encompassing 25 local authority areas⁶.

The SDC extends from the north Wales coast from the Isle of Anglesey through to Liverpool and Manchester and down to Chester, Crewe, Stoke and Derby. Key movements are associated with the Cheshire Science Corridor and Atlantic Gateway, Manchester Airport to North Wales Arc, and Crewe Northern Gateway, considering cross-border movements into the Midlands and North Wales. This movement is primarily for commuting, business and

⁶ Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, Wigan, Halton, Knowsley, Liverpool, St. Helens, Sefton, Wirral, Isle of Anglesey, Gwynedd, Conwy, Denbighshire, Flintshire, Wrexham, Warrington, Cheshire East, Cheshire West and Chester

leisure, where the corridor connects the Port's of Liverpool and Holyhead; and the Airports at Manchester and Liverpool to Important Economic Centres (IEC's) both within and beyond the West and Wales geography.

The West and Wales SDC has a scope of interest that is defined by three areas within the core TfN geography. They each have representation from political leaders on TfN's Partnership Board, though it should be noted that their roles and responsibilities differ with respect to devolved powers for transport. They are:

- The Liverpool City Region Combined Authority
- The Greater Manchester Combined Authority
- The Cheshire & Warrington Local Economic Partnership (LEP) - encompassing a voluntary partnership between the individual Unitary Authorities of Cheshire West and Chester (CW&C), Warrington and Cheshire East Council (CEC).

The economic relationships of the West and Wales SDC extend beyond the core geography of TfN. In recognition of the travel demands that are generated across boundaries, the following additional national and sub-national bodies have membership of the Project Board for the commission:

- Welsh Government, accounting for movements to/from England to/from North Wales.
- Midlands Connect, accounting for movements to/from the south and east of Crewe.

As shown in Figure 4, the SDC has a highly variable topography. Urban development is predominantly located at lower elevations associated with coastal areas, valleys or lower elevations between hills and mountains on the boundaries associated with large designated landscapes such as the Snowdonia National Park and the Peak District National Park (both of which are just east and west of the SDC boundary).

2.2.1 The Highway Network

The highway network within the West and Wales SDC largely reflects its central location within north west England, connecting a number of IECs on a north – south and east – west axis. The Strategic Road Network (SRN) performs a number of functions; not only linking the IEC's contained within the geography, but also acting as nationally (and internationally) significant trade routes for movement to / from and through the SDC area.

Manchester and Liverpool are linked by the M62, which forms part of a critical *all-weather* motorway corridor across the Pennine frontier, ultimately linking the North West with Leeds and the North East. The importance of this route is emphasised by the lack of an alternative dual carriageway standard route between the A50 in Staffordshire and the M8 in Scotland, noting that the A66 improvement forms part of the reference case. The M62 acts as a land-bridge between the Atlantic-facing Port of Liverpool, which has recently seen substantial private sector investment to accommodate the largest Post-Panamax ships (and is also a substantial Irish Sea Hub), with the North Sea-facing Ports of Immingham and Hull that provide a wide range of links to Europe. It also acts as a local distributor of traffic to Warrington, and around the north of Greater Manchester as part of the M60 orbital motorway.

The M6 bisects the SDC on a north to south basis, linking Scotland with the West Midlands, and ultimately the South East (via the M40), and the South West (via the M5). The towns of Warrington and Crewe have thrived on their historic proximity to the strategic road and rail networks, and both are served by the M6. This is a significant positive in terms of promoting growth and attracting investment; however, it can also have a detrimental effect in terms of traffic utilising local roads during periods of perturbation on the SRN.

The M56 provides an east-west motorway standard route between central Manchester (via the A5103) and North Wales, linking significant clusters of economic opportunity in the Energy, Health Innovation, and Advanced Manufacturing Industries on the south bank of the River Mersey. The M56 provides a key link for Chester and Ellesmere Port, interchanging with the M53 for Birkenhead and Liverpool; the A483 for Wrexham, Mid-Wales and the West Midlands; and, the A494 / A55 for the North Wales Coast and the Irish Sea Port of Holyhead. The M56 provides the strategic highway access to Manchester International Airport, which acts as a regional hub for the North of England and is forecasted to grow significantly over the next 30 years. The M56 alongside Mersey Gateway is also a key strategic route for access to Liverpool John Lennon Airport from Cheshire and North Wales.

The multiplicity of demands for travel on a constrained network create issues of poor performance on SRN corridors such as the M6, M56, the M62 and key radial routes on the Major Route Network (MRN) associated with the conurbations of Liverpool and Manchester. This has led to a widening of the notional peak periods for local movement, and a more sustained level of poor journey reliability for through-movement. The physical geography of the West and Wales SDC also contributes to the performance of the network, with limited opportunities to re-route from the SRN during periods of closure, on account of limited high-level crossings of physical barriers such as the Manchester Ship Canal and the River's Mersey and Dee. As such, levels of resilience and recovery to incidents are poor, and currently have a detrimental effect on the economy of the north west.

2.2.2 The Rail Network

The North currently has a modal share for rail commuting of 3.4%, defined both in terms of residence and workplace. This figure is comparable with rail mode share for the rest of England outside of London and the South East; however, it encompasses significant concentrations of activity around major cities such as Manchester, Liverpool and Leeds, where suburban rail networks improve the catchment considerably, as well as significant areas that have limited or no access to a regular service. As such, a relatively small (and geographically concentrated) proportion of the North's population use rail to commute, therefore presenting significant scope to support the growth of the economy.

There is a current disparity between north-south and east-west passenger rail connectivity in the North of England. Those services which utilise the West Coast Mainline (WCML) for some or all of their journey tend to be significantly quicker than those operating across east-west corridors such as the Cheshire Lines Committee (CLC), Mid Cheshire, or Chat Moss routes.

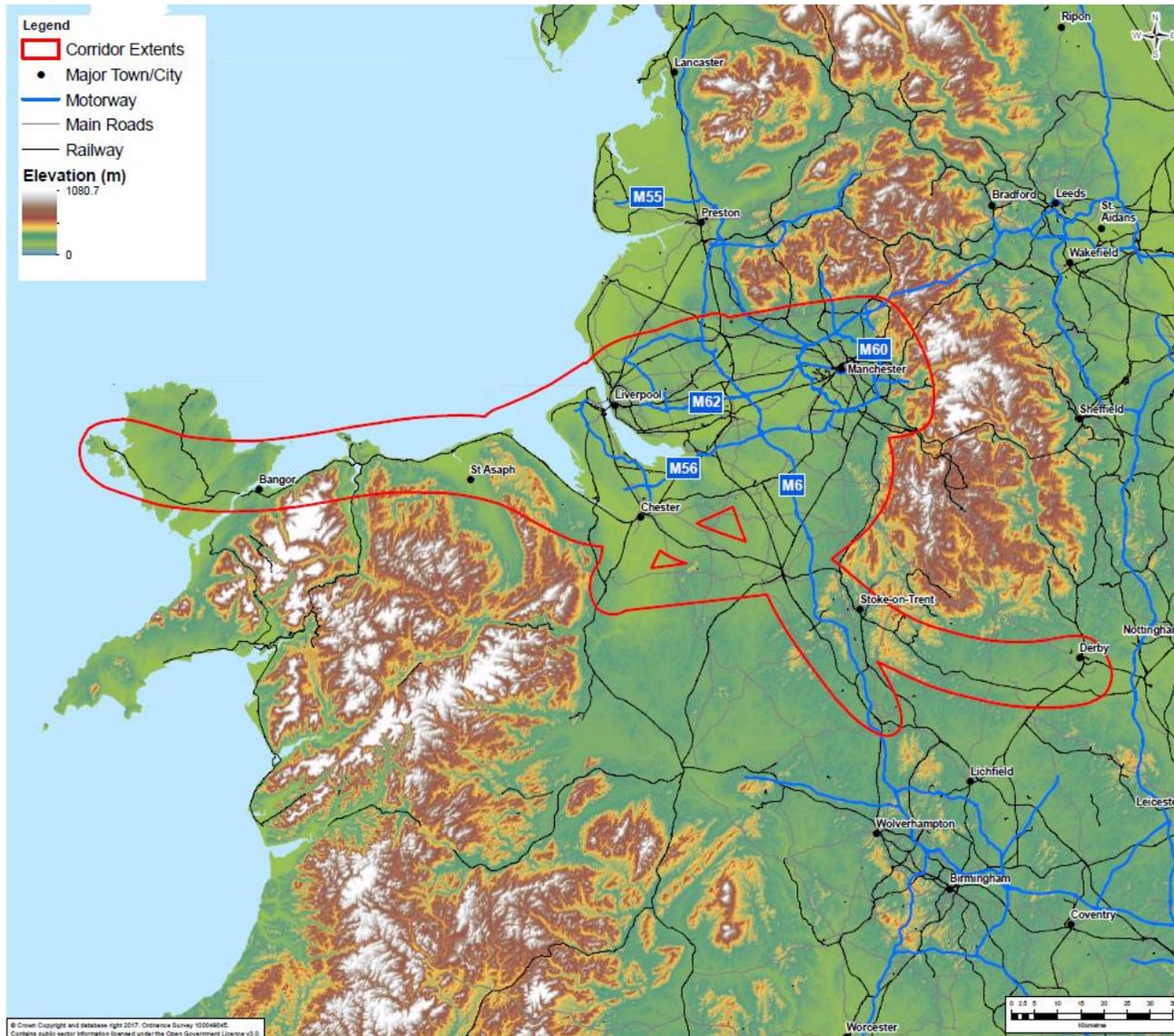
North-south passenger rail connectivity, particularly to and from London, has been improved through sustained periods of investment to the West Coast Main Line. However, despite these improvements there are historic connectivity gaps between the North and some other areas of the UK where demand exists for a direct or improved connection. Major cities such as Manchester and Liverpool have limited (or no) direct connectivity to major cities such as Bristol, Cardiff, Derby and Leicester.

The West & Wales SDC contains several low-speed, infrequent and unreliable intercity and interurban rail services, which serve to extend the perceived distance between IECs for commuters, and act as a barrier to travel. Furthermore, issues such as overcrowding and unsuitable rolling stock can make rail travel unproductive, effectively removing one of rail's key advantages over other modes. The poor perception of rail within the north, and specifically the West and Wales SDC serves to increase the pressure on the road network since travelling by car represents a major travel time incentive, especially on east / west inter-urban services between Manchester, Warrington, Liverpool, Chester, and the North Wales Coast.

With regard to tourist connectivity, timetables and capacity provision are not always aligned to seasonal demand patterns and special events, with evidence of overcrowding at key times, and poor direct links to rural or peripheral tourist destinations. Furthermore, the configuration of rolling stock is often not suited to larger groups or significant luggage requirements.

Currently, rail service provision from Important Economic Centres to their catchments in the evening is inconsistent, with a more sporadic timetable unable to service the burgeoning night time economy of cities such as Liverpool, Manchester and Chester, especially on Sundays. Service improvements committed in the Northern and TransPennine Express franchises will go some way towards addressing these issues, but gaps will remain.

Figure 4: Geographical Scope of West and Wales SDC



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2.3 Environmental Assets

The West and Wales SDC contains several environmental assets that are highly valued at a local to international scale. An overview of key designations is described below and shown on an Environmental Constraints Map provided as Figure 8, Figure 9, Figure 10, Figure 11 found in Appendix A. Furthermore, details relating to the environmental baseline of the SDC can also be found in Appendix A.

The West and Wales SDC borders the Snowdonia and Peak District National Parks. Consequently, there are distinctive landscape areas immediate adjacent to these national parks within the SDC. These landscapes cover 24.5% of the SDC area and are valued nationally, regionally and locally as recreational resources for their natural beauty, wildlife and cultural heritage. The SDC also contains two Areas of Outstanding Natural Beauty (AONB), a statutory designation given to landscapes highly valued for their visual amenity.

Features of historic importance are located throughout the West and Wales SDC; and include those protected by international, national and local designations. Of these, the most highly valued are World Heritage Sites, of which the SDC contains three: Liverpool Maritime Mercantile City, The Castles and Town Walls of King Edward in Gwynedd and Derwent Valley Mills World Heritage Sites. A wide range of other historic and cultural heritage features are located throughout the corridor, especially located within or around the main urban areas. These include Registered Battlefields, Scheduled Monuments, Registered Parks and Gardens and Listed Buildings.

Throughout the SDC there are several sites designated at the International (European) or National (United Kingdom) level for nature conservation purposes. The sites protected at the International level are Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Wetlands of International Importance (Ramsar) sites. There are 26 SACs, 10 SPAs and 8 Ramsar are located within the SDC. Many areas contain multiple designations; where much of the coast line off Liverpool, Wirral, North Wales and Mersey and Dee Estuary are designated as a SAC and SPA. Of national biodiversity designations, there are also 191 Sites of Special Scientific Interest (SSSI) and 10 National Nature Reserves (NNR).

3. Environmental Appraisal of the SPOC

3.1 Overview

This EAR supports the West & Wales SPOC with an appraisal of its Strategic Outline Programme (SOP) list of interventions. In turn, the SOP list forms part of the composite “Pan Northern” Investment Programme within the STP. This section summarises our approach to the Environmental appraisal; it has been developed in full collaboration with the consultant teams responsible for the concurrent delivery of the Connecting Energy Coasts, Southern Pennines / Yorkshire to Scotland, and Central Pennines SDCs.

The EAR has been developed with due cognisance to the Integrated Sustainability Appraisal (ISA) of the STP. The ISA fulfils the requirements for Sustainability Appraisal / Strategic Environmental Assessment (SA/SEA), Health Impact Assessment (HIRA), Equality Impact Assessment (EqIA) and Community Safety Assessment (CSA). While the ISA includes assessment of issues relating to Habitat Regulations Assessment (HRA), a HRA Stage 1 Screening Report was published separately from the ISA Report.

The ISA reports the likely sustainability effects of implementing the STP and reports on the process of developing the STP from a sustainability perspective, which the concurrent process of the ISA has supported. In doing so, the ISA supports the STP’s objective of ‘promoting and enhancing the built, historic and natural environment’ and the identified role of the STP to ensure a sustainable investment programme. It should be noted that the ISA was produced in advance of the final STP Investment Programme being completed; it was therefore based on a set of assumptions regarding the likely types of intervention for each SDC.

In accordance with DfT’s WebTAG appraisal process and the core objectives of the STP, the environment has, and will continue to be taken into account though the process illustrated in Figure 5 which follows an interpretation of the HM Treasury Green Book for the development of Business Cases for Programmes. It has been considered in further detail within key supporting documents to the West and Wales SPOC, notably the Combined Modelling and Appraisal Report (ComMA)⁷. The ComMA in turn summarises the technical elements of earlier contributory “Products” to the overall SPOC process.

Figure 5: Programme Level Business Case Development of the Strategic Development Corridors



⁷ The West and Wales Combined Modelling and Appraisal Report (ComMA) – Jacobs, 2019

3.1.1 Environmental Impact Appraisal

Environmental topics as outlined in the WebTAG appraisal guidance have been subject to an environmental impact appraisal. However, considering the high-level nature of the programme of interventions proposed through this study and associated uncertainty, not all topics will be considered within the SPOC.

Environmental topics to be presented in an Appraisal Summary Table (AST), based on a qualitative assessment, for the SPOC comprise the following:

- Noise;
- Air Quality; and
- Greenhouse Gases.

Environmental capital topics, as follows, will not be presented in the AST and have instead been subject to a risk-based appraisal:

- Landscape;
- Townscape;
- Historic Environment;
- Biodiversity; and
- Water Environment.

It is considered that at this stage, insufficient information relating to the characteristics of the SOP interventions is available to appraise the nature and magnitude of impacts relating to these topics. These topics are however subject to a risk-based appraisal, as reported in this document to inform decision-makers. At later stages of the transport appraisal process these topics will be considered fully in accordance with WebTAG guidance.

Further detail relating to the approach taken to environmental impact appraisal can be found below.

3.1.2 Inputs to the SPOC

The scope and methodology undertaken for environmental appraisal undertaken as an input to the SPOC is outlined in the Appraisal Specification Summary Table (ASST) included as Table 2 below.

The appraisal is based upon a high-level understanding of the nature of proposed interventions included within the SOP as outlined in Section 4, and a high-level understanding of the spatial issues and constraints associated with these topics, in the context of anticipated future trends as outlined in Appendix B. This qualitative appraisal has also been informed by outputs from traffic modelling that relate to traffic flows and changes.

Table 2: Appraisal Specification Summary Table (ASST) – Environmental Topics

Impacts	Sub-impacts	Estimated Impact in SPOC	Level of uncertainty in SPOC	Proposed proportionate appraisal methodology	Reference to evidence and rationale in support of proposed methodology	Type of Assessment Output (Quantitative/ Qualitative/ Monetary/ Distributional)
Environmental	Noise	Small	Medium	Qualitative review of potential effects informed by traffic modelling	TAG A3	Qualitative
	Air Quality	Unknown	Medium	Qualitative review of potential effects informed by traffic modelling	TAG A3	Qualitative
	Greenhouse gases	Unknown	Medium	Qualitative review of potential effects informed by traffic modelling	TAG A3	Qualitative
	Landscape	Unknown	High	Section 3.1.3	Section 3.1.3	Risk-based appraisal
	Townscape	Unknown	High	Section 3.1.3	Section 3.1.3	Risk-based appraisal
	Heritage of Historic resources	Unknown	High	Section 3.1.3	Section 3.1.3	Risk-based appraisal
	Biodiversity	Unknown	High	Section 3.1.3	Section 3.1.3	Risk-based appraisal
	Water Environment	Unknown	High	Section 3.1.3	Section 3.1.3	Risk-based appraisal

3.1.3 Appraisal of Environmental Capital

Environmental capital topics will not be presented in the AST and have instead been appraised using a risk-based approach. The results of this appraisal are presented in Section 5 of this report.

The appraisal is based upon a high-level understanding of the nature of proposed interventions included within the SOP as outlined in Section 4.

A risk-based system has been adopted to provide guidance on whether the baseline information suggests there are likely to be any spatial constraints / implications that will need consideration, in the context of the anticipated future trends outlined in Appendix B.

3.1.4 Policy Appraisal

A policy appraisal has been undertaken to identify any conflicts that the SOP may have regarding environmental policy relating to the environmental topics as listed in WebTAG Unit A3. This has been appraised using a risk-based approach. The results of this appraisal are presented in Section 6 of this report.

The appraisal review is based upon a high-level understanding of the nature of proposed interventions included within the SOP as outlined in Section 4. These interventions have been appraised against the environmental policy outlined in Section 6. Policy at the national and regional level only has been reviewed. Information collated for the environmental impact appraisal has been utilised to inform an understanding of potential policy conflicts.

A risk-based system has been adopted to provide guidance on whether the environmental impact appraisal suggests there are likely to be any policy conflicts that will need consideration, in the context of the anticipated future trends outlined in Appendix B.

3.1.5 Integrated Sustainability Appraisal (ISA) Objectives Appraisal

An appraisal of the SOP against the ISA objectives has been undertaken to ensure that they continue to inform the development of the STP at the programme level. The ISA objectives and outcomes of the appraisal are presented comprehensively in Section 7 and reproduced below:

- Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport
- Protect and enhance biodiversity, geodiversity and the green infrastructure Network
- Conserve and enhance the international sites (HRA specific objective)
- Protect and enhance air quality
- Increase resilience of the transport network to extreme weather events and a changing climate
- Protect and enhance the inland and coastal water environment
- Protect and conserve soil and remediate / avoid land contamination
- Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings
- Protect and enhance the character and quality of landscapes and townscapes
- Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling
- Enhance lower carbon, affordable transport choice
- Enhance long term economic prosperity and promote economic transformation

- Coordinate land use and strategic transport planning across the region
- Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)
- Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)
- Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)

Only ISA objectives relating to the environmental topics as listed in WebTAG Unit A3 have been considered. Therefore, ISA objectives deriving from the social and economic aspects of the ISA, including HIA, EqIA and CSA, have not been appraised. A high-level appraisal of the SDC against these objectives is provided in the ISA, and has been acknowledged in Section 7 of this report. Where the proposed SOP interventions align with the assumptions made in the ISA, the appraisal scores and associated commentary have been included in the appraisal in Section 7. For an appraisal of distributional impacts of the SOP on communities, the high-level commentary included within the SPOC should be referred to.

The five-point assessment scale used in the ISA has been applied to provide guidance on whether the environmental impact appraisal suggests there are likely to be any conflicts with the ISA objectives that will need consideration, in the context of the anticipated future trends outlined in Section 3.8 and Appendix B. This appraisal utilises the decision-making questions provided in the ISA, which are included in Appendix D.

3.2 Reference Case

The Government is already funding a significant programme of transport interventions across the North. In addition, further investment is being planned by both central Government and local bodies. This includes road investment schemes put forward by Highways England, transport schemes developed by combined authorities across the North, Pan-Northern schemes such as Northern Powerhouse Rail (NPR) being developed by TfN and DfT, and HS2, led by Central Government as well as Welsh Government where applicable. It is therefore expected that significant investment in new transport infrastructure will be delivered in the next decades to address significant connectivity challenges of the current transport system.

In this context, a reference case as a ‘do-minimum’ scenario has been developed by TfN which includes both committed schemes and non-committed strategic interventions that can be reasonably expected to be delivered in the medium and long term and are necessary to achieve the North’s economic growth aspirations.

For the purposes of this study, the Transport Appraisal Guidance (WebTAG) definition of reasonably foreseeable has been extended for the SDCs to include any strategic intervention that is at Strategic Outline Business Case (SOBC) stage or equivalent, including interventions without an identified funding route. Post 2025 the reference case includes other work programmes identified by the STP as necessary to achieve the North’s economic growth aspirations.

Table 3 Reference case parameters and assumptions

2020-2027	Post 2027
STP ‘baseline investment assumptions’ will be included in the Reference Case (already been confirmed by Highways England, Network Rail, DfT and Welsh Government as committed).	Reference Case includes other work programmes identified by the STP as necessary to achieve the North’s economic growth aspirations; HS2, Northern Powerhouse Rail, Northern Trans-Pennine Routes, Trans Pennine Tunnel & Wider Transport Connectivity Assessment and Manchester North West Quadrant (including public transport elements).
Interventions identified by the SDC consultants and TfN as being ‘reasonably foreseeable’.	Reference Case should be developed to ensure a ‘do-minimum’ standard within the transport model is represented.

2020-2027	Post 2027
WebTAG definition of reasonably foreseeable has been extended for the SDCs to include any strategic intervention that is at SOBC stage or equivalent, including those without an identified funding route.	
Expect to include interventions within Highways England's Road Investment Strategy and Network Rail's Enhancements Delivery Plan	

For a full list of interventions covered by the reference case for the West and Wales SDC, see Table 4.

Table 4 Reference Case: List of interventions (Road/Rail)

Road	Rail
<ul style="list-style-type: none"> • Crewe HS2 Hub – Access package and depot access improvements • A500 dualling – Crewe to M6 • A6 to M60 Relief Road • Port Salford Western Gateway Infrastructure Scheme • 15 schemes, including international gateway improvements such as A63 Castle Street and A5036 Princess Way, north – south improvements on the M6, the A1 and the A19 and east – west improvements on the M62 • East – west improvements on the M62 • Middlewich Eastern Bypass • Congleton Bypass • Warrington Waterfront Western Link • Poynton Relief Road • A55 Northop to A494 Shotwick improvement • 	<ul style="list-style-type: none"> • HS2 Phase 2a • HS2 Phase 2b • Crewe Hub • Wigan North Western station (or integrated station at Wigan) - Stockport Capacity Improvements • Northern Powerhouse Rail • Interventions at the major hubs necessary to realise the benefits of improved connectivity along the NPR corridors, including, within the West & Wales SDC: Warrington, Stockport, Manchester Piccadilly, Liverpool Lime Street • Transpennine Route Upgrade (including Intermediate Interventions) • Northern, Transpennine Express and Wales and Borders rail franchise commitments • Liverpool Central Station • Manchester - Preston improvements • Liverpool City Region upgrades • Cross Manchester Capacity and Reliability

The influence of the Reference Case schemes on the environmental baseline has not been considered in this study. In accordance with legislation, these Reference Case interventions will be subject to appropriate environmental assessment. It is anticipated that through this process any significant environmental effects will be minimised through the application of mitigation. Insufficient information is available at this time to assess and consider any residual environmental effects that may result from these Reference Case schemes.

3.3 Sub-corridors

The West and Wales SDC represents a complex series of sub-corridors, which have been defined as outlined in the ASR (Product 4). Following examination of the assets, movements and issues within these sub-corridors, SOP interventions have been identified.

The appraisal of the SOP interventions has considered the effect on the SDC, rather than the separate sub-corridors.

3.4 Baseline Data Collection

An environmental baseline has been collated that is proportionate to the level of information required at the programme level.

The following spatial environmental datasets have been utilised to establish an environmental baseline used in the identification of environmental impacts of the SOP interventions.

Table 5: Data Sources for Baseline Environmental Assessment

Environmental Topic	Datasets Considered	Datasets Not Considered
Noise	Noise Important Areas Strategic Noise Mapping	
Air Quality	Air Quality Management Areas (AQMAs) EU Limit values (Defra National Pollution Climate Mapping)	
Greenhouse Gases	Local Authority CO ₂ Emissions (National Atmospheric Emissions Inventory)	
Cultural Heritage	Registered Battlefields Registered Parks and Gardens Scheduled Monuments World Heritage Sites Listed Buildings	Conservation Areas Historic environmental record Non-statutory historic designations
Landscape	Area of Outstanding Natural Beauty (AONBs) Heritage Coasts National Parks (& Proposed) Country Parks Green Belt National Character Areas (and profile documents)	Local landscape character assessments Non-statutory landscape designations
Nature Conservation / Biodiversity	Local Nature Reserves RAMSAR Sites & pRAMSAR Special Areas of Conservation & pSACs Special Protection Areas & pSPA SSSIs Ancient Woodlands National Nature Reserves Local Wildlife site Important Bird Areas BAP Priority Habitats RSPB Reserves	Protected species data
Water Environment	Flood zones Main Rivers Ordinary Watercourses Groundwater source protection zones	Water Framework Directive (WFD) Classification

3.5 Baseline Environmental Change

The SOP interventions are anticipated to be delivered between 2025 and 2050. As such, the environmental appraisal has been undertaken on a baseline of 2025 to 2050. Anticipated trends have the potential to change the characteristics and value of environmental resources.

The environmental baseline upon which the impact appraisal has been undertaken has been informed by anticipated trends arising from Thought Leadership on Future Technology (summarised within the SPOC), as well as Appendix D.1 of the Integrated Sustainability Appraisal.

This anticipated baseline has been utilised consistently for all scenarios that have been appraised. Further changes in the environmental baseline may result from the appraised transformational scenarios. Implications for the environmental baseline that are specific to the drivers of these scenarios will result in differences in the environmental baseline that the SOP interventions are appraised against. These assumptions have been acknowledged in the appraisal.

Where anticipated trends have the potential to alter the characteristics of the environmental baseline, the Precautionary Principle has been applied in the appraisal of SOP interventions; when uncertain, environmental resources have been assumed as the highest applicable value and any impacts appraised in relation to this value.

3.6 Environmental Policy Review

A review of national and regional policy has been undertaken to outline the environmental policy against which the SOP will be appraised. A summary of the environmental policy reviewed is presented in Section 6.1.

It is acknowledged that environmental policy will likely undergo changes by the time at which the SOP interventions seek development consent. However, the appraisal has been undertaken on current policy as outlined in Section 6.1. It is considered that changes in policy cannot be predicted with sufficient accuracy.

3.7 Limitations

The appraisal undertaken has inherent limitations that must be acknowledged in presenting the outcomes to inform decision-making. These are summarised as follows:

- SOP interventions are at a concept stage and have been appraised on an understanding of the likely characteristics. The appraisal scores may change once further scheme design is undertaken;
- Changes in the environmental baseline are based on an understanding of anticipated trends;
- Assumptions have been made relating to the environmental implications of the scenarios that have been appraised;
- Implications of the Reference Case schemes for the environmental baseline has not been considered. It is assumed that any environmental impacts will be minimised through the application of mitigation;
- Policy appraisal has been undertaken based on a review of current environmental policy. Changes in environmental policy have not been considered.

4. Strategic Outline Programme (SOP)

Environmental appraisal, as presented within Sections 5, 6 and 7, has been undertaken on the individual SOP interventions as included within the West and Wales SPOC⁸. The Environmental appraisal is focused on road and rail interventions that have been appraised within the Economic Dimension of the SPOC at this very early stage of programme development for the West and Wales SDC.

At present there are a number of interventions that have a strong strategic case but are not adequately represented by the NTEM Core travel market scenario. For the economic appraisal, some road and rail have not been not appraised at this stage and will be covered in subsequent stages of development against transformational growth forecasting. Further detail on the appraisal methodology is provided Within the ComMA.

The Road and Rail SOP Interventions are presented within Table's 6 & 7, including those not encompassed by the economic appraisal. For the environmental appraisal, all schemes have been considered, as represented by Figure 6 and Figure 7.

Table 6: Road SOP Interventions

Road Interventions Appraised within the Economic Dimension	Road Interventions Not Appraised within the Economic Dimension at this stage
<ul style="list-style-type: none"> • A534 route upgrade • A34 (potential expressway) • A54 improvements (A556 to A55 - potential expressway) • Improvements to the A536 Corridor between Congleton and Poynton • M6 Improvements Junctions 19 to J21a • A500 dual carriageway with grade separated junctions • A51 improvements (Nantwich to Chester - potential expressway) • Chester Box improvements (A550, A494/A548 to M53 link, Chester Broughton growth corridor) • M56 Junctions 11 to 15 • Highway and public transport interventions to support the future growth of Manchester Airport and its enterprise zone and facilitate access to a future Airport HS2 Station, e.g. M60/M56 interchange improvements • Cooperative working with Midlands Connect to implement and support operational interventions with regards to the Key Route Network • Targeted improvements on the A556 between M6 J19 and A54 • Northwich and Winsford transport improvements package • Eastern route access package to LJLA and associated developments • A580 dual carriageway with some grade separated junctions • M62 Junctions 5 to 10 • Highway interventions to unlock employment and housing growth potential and improve strategic and local connectivity 	<ul style="list-style-type: none"> • Multimodal access improvements to ensure Crewe HS2 Hub and neighbouring developments are well connected, including measures to address existing congestion on the corridor between the A530 and A534 to the north of Crewe • Middlewich southern and western link (including access to the M6 from Winsford) • Improve connectivity and resilience to the Cheshire, Warrington and the Potteries economic clusters • Warrington Growth Programme transport improvements package • M6 Improvements Junctions 16 to 17 • M6 Junction 25 slip roads • Coordinate management operations with Welsh Govt & Midlands Connect regarding signing & Technology on A534 / M6 / A50 Route • Nantwich southern relief road • Improvements to A483 between Junctions 4 to 6 • A55 Northop to A494 Shotwick improvements • Cooperative working with TfGM and the districts to implement and support operational interventions with regards to the Key Route Network • Cooperative working with TfGM / Liverpool City Region to implement and support operational interventions with regards to the Key Route Network • Cooperative working with Liverpool City Region to implement and support operational interventions with regards to the Key Route Network

⁸ West and Wales Strategic Programme Outline Case (February 2019) – Section 6

- across the north and west of Greater Manchester, e.g. Wigan to Bolton strategic route
- Highway interventions to support Atlantic Gateway employment and housing growth, reduce the severance impact of the Manchester Ship Canal and improve connectivity to the Strategic Road Network (including M62-Carrington-M60 link and M62 to A57 junction and link)
- Cooperative working with Lancashire County Council to implement and support operational interventions with regards to the Key Route Network
- M57 Junctions 4 and 5 and Switch Island (M57/M58/A5036)

Figure 6: West and Wales SDC SOP Road Interventions Map -includes schemes promoted by Welsh Government and Multi-modal interface

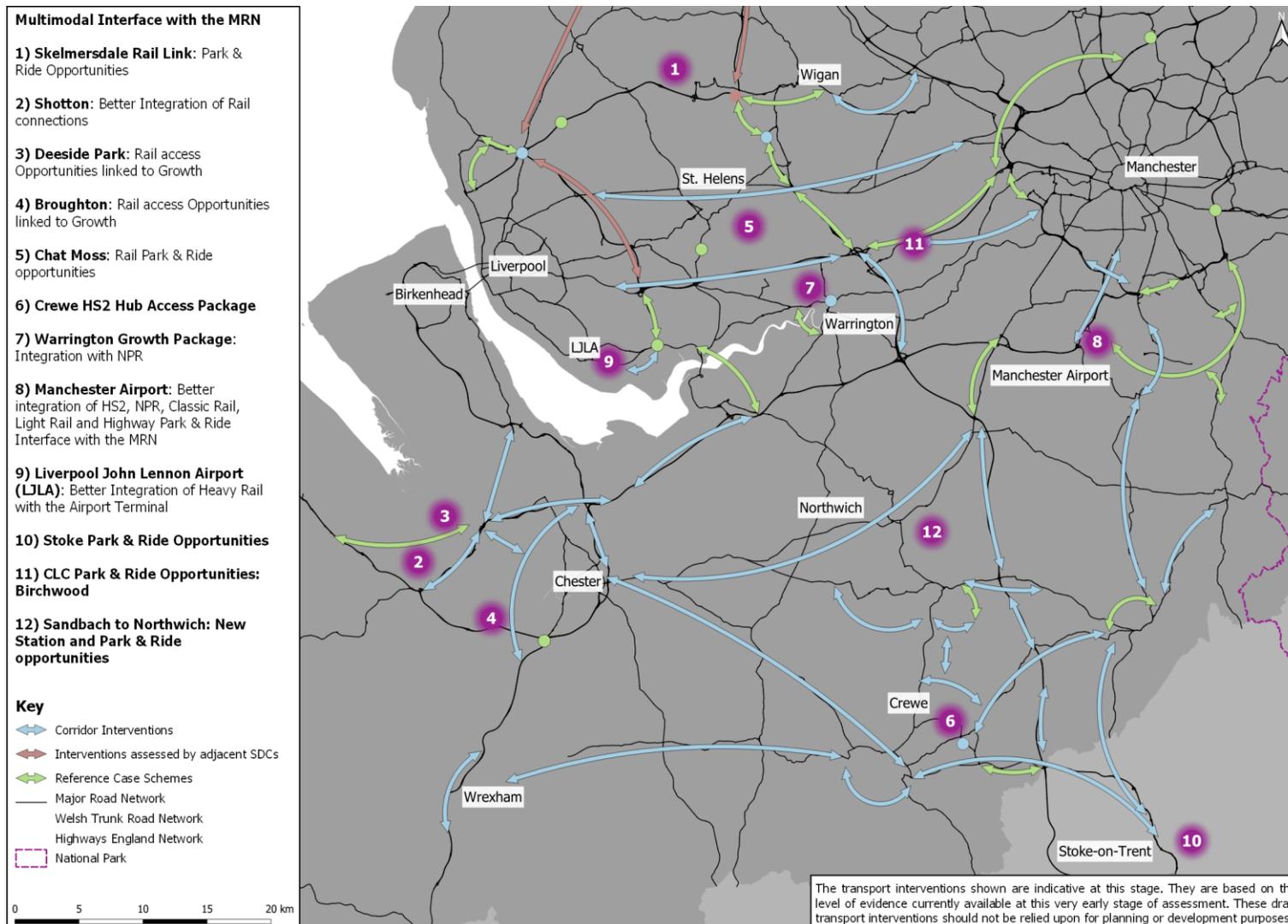


Table 7: Rail SOP Interventions

Rail Interventions Appraised within the Economic Dimension	Rail Interventions Not Appraised within the Economic Dimension at this stage
<ul style="list-style-type: none"> • Journey time improvements Preston to Blackpool North • Skelmersdale rail link • East Lancashire Line (journey time and capacity improvements) • Burnley to Manchester journey time and service improvements • Preston to York (journey time improvements) • Crewe – Stoke - Derby (journey time improvements) • Extension of North Staffordshire services to Nottingham and Manchester Airport • Manchester – Skelmersdale (via Wigan) service frequency enhancement • New stations at Droylsden/Littlemoss (Eastern Gateway) and Stoke park and ride • Buxton Line (journey time improvements) 	<ul style="list-style-type: none"> • South Fylde Line (journey time and capacity improvements) • Service frequency enhancements between Ormskirk and Preston • Liverpool to Preston (journey time and service improvements) • Southport to Wigan (journey time improvements) • Colne to Accrington (journey time and service improvements) • York to East Coast journey time improvement • Skipton – Colne reopening • Bradford to Leeds (journey time improvements) • Harrogate Line (journey time improvements) • Blackburn to Manchester Victoria (journey time improvements) • Rossendale to Manchester public transport connectivity • New stations at Leeds Bradford Airport Parkway, East Leeds Parkway and Cottam Parkway • Rapid transit link between Liverpool South Parkway station and LJLA • York to Hull (service improvements) • Hull to Scarborough (journey time and frequency improvements) • Cumbrian Coast Line – journey time and capacity improvements • Whitehaven to Newcastle (frequency improvements) • Furness Line – Journey time and reliability improvements • Windermere to West Yorkshire (service improvements) • Tyne Valley Line – route upgrade and service improvements • Durham Coast Line – route upgrade and service improvements • Middlesbrough to York journey time and service improvements • Bishop Auckland to Saltburn Line journey time improvements • Increased service calls at Hartford and other WCML stations • Mid-Cheshire Line (journey time and capacity improvements) • Northwich to Sandbach reopening and new stations • Knutsford to Manchester Airport (Western Link connection) • Extension of Leeds – Chester service to Llandudno Junction • New station at Broughton • Direct connectivity between Preston/Bolton and Sheffield • Rail connection and station for Doncaster Sheffield Airport • New station between Barnetby and Habrough • South Trans-Pennine Line – journey time and capacity improvements between Doncaster and Cleethorpes • Sheffield to Lincoln (journey time improvements and service frequency enhancements) • Penistone Line (journey time improvements and service frequency enhancements) • Hallam Line (journey time improvements) • Barnsley – Doncaster direct services • Sheffield – Nottingham (journey time improvements)

Figure 7: West and Wales SDC SOP Rail Interventions Map



5. Environmental Impact Appraisal

5.1 Inputs to Strategic Outline Case (SPOC)

Table 8 below presents a summary of the WebTAG compliant appraisal of the SOP interventions on noise, air quality and greenhouse gases, based on the qualitative assessment. The rationale behind this assessment score is provided in greater detail within this Section.

Table 8: Summary of WebTAG Appraisal Summary Table (AST) Scores

Topic	Score
Noise	Moderate Adverse
Air Quality	Moderate Adverse
Greenhouse Gases	Moderate Adverse

5.1.1 Noise

The SOP includes a number of transport interventions which have the potential to alter noise levels experienced by sensitive receptors. Exposure to noise from road and rail traffic can lead to significant adverse effects on human health and quality of life, as well as adverse effects to other environmental receptors including cultural heritage, landscape and habitats and species.

The SOP includes several interventions which pass through or are adjacent to existing road and rail Noise Important Areas (NIAs). These have the potential to cause significant impacts on the existing NIAs and surrounding areas. New infrastructure included in the SOP has the potential to expose new receptors to strategic levels of road or rail noise. The SOP interventions include, the link between Congleton Bypass and M6 Junction 17 and M62-Carrington-M60 highway link. The interventions have the potential to have significant effects on the adjacent noise environment, with potential adverse effects on receptors including residential properties through encouragement of use of private vehicles. However new road schemes implemented as part of the SOP interventions, including a Crewe North Bypass, Nantwich Southern Bypass, Middlewich Southern Bypass and Winsford Southern Bypass are likely to have a net beneficial effect where traffic is moved away existing routes thereby reducing noise in these residential areas.

Improvements to existing infrastructure have the potential to change noise levels at adjacent sensitive receptors. The SOP includes interventions which will enhance the performance and capacity of the existing road and rail network, these include improvements on the A536 between Macclesfield and Congleton, expressway upgrade of A34 (Congleton to Wilmslow) including widening of Alderley Edge bypass, segregated HGV bypass lane between M6 J.16-19, widening of A483 between Junction 4 - 6 and a number of junction improvements and railway improvements. Where there is an increase in road traffic flows or train service frequencies as a result of the interventions i.e. Manchester to Skelmersdale (via Wigan) service frequency enhancement, the adjacent receptors are likely to experience an increase in noise levels. Whilst traffic flows may increase as a result of the SOP, infrastructure improvements and mitigation resulting from the interventions have the potential to reduce noise effects. The development and approval process of interventions will be subject to modern standards and policy, for which current policy is summarised in Appendix C.

Rail interventions included within the SOP have been reported in the Rail SPOC (which considers rail interventions in all the SDC areas) to encourage some modal change from road to rail, which will have a small beneficial effect. With the future consideration of more regional interventions, including a change to electric trains, further benefits would be achieved.

It is anticipated that adverse effects would also be offset by the anticipated move in the medium to long term to electric vehicles and improvements in road vehicle fuel efficiencies. It is anticipated that future policy, building upon

current policy outlined in Appendix C, will support the transition to electric propulsion and continue to require new developments to support aspirations to reduce the number of people impacted by noise.

5.1.2 Air Quality

Transport interventions included within the SOP have the potential to influence air quality concentrations experienced by sensitive receptors. Exposure to air pollutant concentrations in exceedance of national Air Quality Standards can have adverse effects on human health.

The creation of new infrastructure included in the SOP will have the potential to expose new receptors to harmful levels of pollutant concentrations, notably nitrogen dioxide (NO₂) encouraging more road traffic. The proposed SOP interventions pass through a number of urban areas containing air quality management areas (AQMA). SOP interventions which pass through or are adjacent to multiple AQMAs include:

- Congleton AQMA No.4 (The A34 and A54) and Congleton AQMA No.5 (Lower Heath) which are adjacent to the proposed Expressway upgrade of A34 (Congleton to Wilmslow) including widening of Alderley Edge Bypass.
- Congleton AQMA No.6 and Congleton AQMA No.2 (West Road, Congleton) which are adjacent to the proposed new and improved link between Congleton bypass and new M6 junction 17.
- Congleton AQMA No.4 (The A34 and A54) and Congleton AQMA No.5 (Lower Heath) and Park Lane, Macclesfield AQMA which are adjacent to proposed improvements on the A536 between Macclesfield and Congleton.
- Greater Manchester AQMA and M6 AQMA (No.1) cover or are adjacent to the proposed A580 upgrade at M6 J23 and westwards towards the A579.
- Liverpool City AQMA, Warrington AQMA No.4 and Warrington AQMA No.1 are adjacent to or cover the proposed smart motorway M62 J5-10.
- Nantwich Road AQMA, AQMA Number 1 – Kidsgrove, AQMA Number 3 – Maybank, Wolstanton, Porthill, Stoke on Trent AQMA, Derby NO₂ AQMA No.1: Ring Roads are adjacent to Crewe – Stoke – Derby rail SOP.
- Nantwich Road AQMA and Earl Street Crewe AQMA are adjacent to the proposed extension of North Staffordshire services to Nottingham and Manchester Airport.

The listed SOP interventions cumulatively or in isolation have the potential to have significant impacts on AQMAs and sensitive receptors in surrounding areas including (but not limited to) residential properties and ecological receptors. Within the SOP interventions, new road schemes have the potential to reduce the impacts of air quality on several residential areas particularly with the introduction of bypasses including a Crewe North Bypass, Nantwich Southern Bypass, Middlewich Southern Bypass and Winsford Southern Bypass. These are likely to have a net beneficial effect by improving air quality in these residential areas by moving the road traffic away. The proposed junction improvements and road improvements are anticipated to reduce congestion. A reduction in stop-start movements allows combustion-engine driven cars to operate at greater levels of efficiency, thereby having a positive effect on air pollutant concentrations in congested locations.

In addition, the Rail interventions have been reported in the Rail SPOC (which considers rail interventions in all the SDC areas) to encourage some modal change from road to rail, which will have a small beneficial effect. The SOP includes rail interventions which would improve rail frequency and capacity including the Crewe- Stoke- Derby journey time improvements and Manchester to Skelmersdale (via Wigan) service frequency enhancement. With the future consideration of more regional interventions, including a change to electric trains, further benefits would be achieved.

It is anticipated that adverse effects would also be offset by the anticipated move in the medium to long term to electric vehicles and improvements in road vehicle fuel efficiencies. The increasing adoption over time of electric propulsion in road and rail transport will significantly reduce the impact of the SOP interventions on air pollutant concentrations. Under the policy outlined in Appendix C, notably the 'Clean Growth Strategy', as well as policy

measures proposed through TfNs Strategic Transport Plan, it is anticipated that the composition of the road fleet utilising the SOP interventions will increasingly comprise ultra-low and zero emission vehicles.

5.1.3 Greenhouse Gases

The SOP has the potential to influence greenhouse gas emissions of transportation, which accounts for approximately a quarter of the UK's carbon dioxide (CO₂) emissions. CO₂ is the primary greenhouse gas of concern to a changing climate. Road transport constitutes the majority source of UK transport emissions. At present, the majority of the road fleet is fuelled by petrol and diesel and as such produce CO₂ emissions.

The SOP includes intervention that involve the creation of new road links and improvements to capacity, performance and reliability of existing infrastructure that will have the effect of encouraging more road traffic, and therefore have a negative effect on greenhouse gas emissions. However, the proposed junction improvements and road improvements are anticipated to reduce congestion. A reduction in stop-start movements allows combustion-engine driven cars to operate at greater levels of efficiency, thereby having a positive effect on greenhouse gas emissions. Schemes including the M62-Carrington-M60 link, Crewe North Bypass, Nantwich Southern Bypass, Middlewich Southern Bypass and Winsford Southern Bypasses have the potential to reduce journey lengths, having a positive effect on greenhouse gas emissions by reducing time combustion engines are emitting greenhouse gases for such journeys.

It is anticipated that adverse effects will be potentially offset by the anticipated move to electric vehicles and improvements in road vehicle fuel efficiencies. Under the policy outlined in Appendix C, notably the 'Clean Growth Strategy', as well as policy measures proposed through the STP, it is anticipated that the composition of the road fleet utilising the SOP interventions will increasingly comprise ultra-low and zero emission vehicles which will have a positive effect on greenhouse gas emissions.

The Rail interventions have been reported in the Rail SPOC to encourage some modal change from road to rail, which will have a small beneficial effect. Improvements to journey time, reliability and capacity on railways such as Crewe-Stoke-Derby, extension of North Staffordshire services to Nottingham and Manchester Airport and Manchester to Skelmersdale, and the construction of a new station at Stoke Park and Ride will make rail a more attractive choice of transport. With the future consideration of more regional interventions, including a change to electric trains, further benefits would be achieved.

The SOP comprises infrastructure schemes that will involve extensive construction and refurbishment of road and rail infrastructure, for which large quantities of construction materials including concrete are required. This therefore involves 'embodied carbon'; CO₂ would be emitted within the process of manufacturing the large quantities of concrete required for the SOP interventions, as well as during the maintenance and future demolition / disposal of materials used in these interventions. However, as stated in the Strategic Transport Plan and with a view to supporting the policy outlined in Appendix C, Transport for the North will explore opportunities to undertake sustainable procurement and be resource efficient, including promoting the circular economy.

Overall, a Moderate Adverse impact is anticipated due to the anticipated greenhouse emissions from increased traffic volumes as a result of road interventions, and embodied carbon. Despite WebTAG assumptions for changing fleet composition of fuel types and increasing fuel efficiency, the TUBA results forecast a negative benefit of -£273.80m as a result of increased Greenhouse Gas emissions. This equates to an additional 6.58m tonnes of non-traded carbon and 0.09m tonnes of traded carbon over the 60-year appraisal period. At this stage however, only a high-level appraisal using current assumptions has been possible; subsequent stages of the scheme development and planning process will involve more detailed appraisal and later Environmental Impact Assessment (EIA) of effects on greenhouse gases.

5.2 Appraisal of Environmental Capital

The summary of the results of environmental capital are included in table 9, and a further description of the potential impacts are discussed in the text below.

The assessment of environmental capital has used a risk-based rating, according to the following criteria:

- Likely to have significant adverse environmental effects;
- Potential to have significant adverse environmental effects; and
- Unlikely to have any significant adverse environmental effects.

Table 9: Summary of Environmental Capital assessment

Topic	Risk Rating	Summary
Landscape	Potential to have significant adverse environmental effects	Potential adverse impacts on landscape character, although these will be mitigated. Risk of landscape impacts to Ashbury Mere, Little Budworth and Brereton Heath Country Parks, although these effects will be mitigated.
Townscape	Potential to have significant adverse environmental effects	Potential adverse impacts from improvements of existing routes and construction of new road scheme located within urban areas. Townscape improvements proposed bypasses and new link interventions.
Historic Environment	Potential to have significant adverse environmental effects	Risk of potential adverse impacts on Tabley House Grade II park and garden from segregated HGV Bypass lanes between M6 J.16-19 Risk of potential adverse impact to Gawsworth (old) Hall Grade II* park and garden from improvements on the A536 between Macclesfield and Congleton. Risk of impacts on the integrity and characteristics of designated and non-designated assets and the setting of these.
Biodiversity	Likely to have significant adverse environmental effects	Potential adverse impacts to European designated sites, however impacts likely to be mitigated. Potential direct impacts on SSSIs, notably through proposed extension the B5210 to the A56 and localised improvements between A49 and Wrexham on the A534. Likely impacts on ancient woodlands, priority habitats and locally designated sites.
Water Environment	Potential to have significant adverse environmental effects	Potential increased risk of pollution of surface watercourse, although this can be mitigated; Number of interventions located within groundwater source protection zones which presents and increased risk to groundwater bodies, particularly A5036 Princess Way (Access to Port of Liverpool) full grade separation of junction, A580 upgrade at M6 J23 and westwards to the A579 and Localised junction improvements between A49 and Wrexham on the A534 located in source protection zone 1 which may be more difficult to mitigate. Following mitigation, no increases to flood risk is likely.

5.2.1 Landscape

The SOP includes interventions which fall within the proximity of the Peak District National Park which is a landscape of the highest national value. The nearest interventions are the proposed improvements to the A536 between Congleton and Macclesfield and Congleton and targeted junction improvement on the A523 between Macclesfield and Poynton. These are over 5km and 2.5km away, respectively, and as such it is anticipated that with mitigation any impacts would be negligible. There are no Areas of Outstanding Natural Beauty potentially affected by the SOP interventions.

Several SOP interventions have the potential to impact local landscape designations. The Expressway upgrade of A34 (Stoke to Congleton) including new road from A534 to A34 and bypass of Scholar Green and a new and improved link between Congleton Bypass and a new M6 Junction, all of which fall within close proximity of Astbury

Mere Country Park. Winsford Southern Bypass is near of the Little Budworth Country Park and Holmes Chapel Bypass falls within close proximity to Brereton Heath Country Park. These schemes have the potential to degrade the visual amenity and tranquillity of these landscapes however with appropriate mitigation, these impacts will be minimised.

In-combination impacts of the SOP interventions may adversely affect the characteristics of the National Character Areas (NCAs). The SOP includes several interventions in NCAs including, Shropshire, Cheshire and Staffordshire Plain (NCA61), Mersey Valley (NCA60), Cheshire Sandstone Ridge (NCA62) and Deeside and Wrexham (NLCA13). SOP interventions cumulatively or isolation may degrade the characteristics of these areas.

The rail interventions would have negligible effect on landscape apart from localised loss of deciduous woodland and potential loss of lowland raised bog for the construction of the Skelmersdale Rail Link rail link.

With all the SOP interventions there will be opportunities for landscape enhancements, through embedded mitigation included in the design process, so that the schemes are sensitive to local landscape character and visual amenity.

5.2.2 Townscape

There are several SOP interventions which fall within settlements and have the potential to impact on physical and social characteristics of the urban environments. Several of the SOP interventions are anticipated to have direct and indirect impacts on townscapes along the route or in proximity of the route. These interventions include improvements to existing routes, and new link routes as well as proposed rail interventions.

Where SOP interventions draw traffic from existing settlements, it is anticipated that these would have a locally beneficial impact on townscapes. The new Holmes Chapel bypass, Nantwich Southern Bypass, Crewe North Bypass, Middlewich Southern Bypass and Winsford Southern Bypass are all anticipated to reduce traffic flows along existing routes in urban areas, therefore improving townscape characteristics i.e. appearance.

5.2.3 Historic Environment

The SOP interventions fall within the proximity of numerous designated heritage assets. However, there are no anticipated impacts on the Liverpool Maritime Mercantile City, the Castles and Town Walls of King Edward in Gwynedd or Derwent Valley Mills World Heritage Sites which falls within the SDC.

The SOP interventions have the potential to affect designated heritage assets comprising of Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields and listed buildings. Several of the SOP schemes are likely to be near these heritage assets and pose direct impacts on the heritage assets as well as setting impacts. The proposed segregated HGV Bypass lanes between M6 J.16-19 falls within or is near the boundary of Tabley House Grade II park and garden, and improvements on the A536 between Macclesfield and Congleton falls within close proximity to the boundary of Gawsworth (old) Hall Grade II* park and garden.

Other SOP interventions which fall in close proximity to registered parks and gardens are, Expressway upgrade of A34 (Stoke to Congleton) including new form A543 to A34 and bypass of Scholar Green at Rode Hall (Grade II), Dual Carriageway with grade-separation on A500 M6 J16 to Stoke at Crewe Hall (Grade II), Nantwich Southern bypass at Dorfold Hall (Grade II) and A5036 Princess Way (Access to Port of Liverpool) full Grade separation of junction at Ince Blundell Park (Grade II*). Many of the scheduled monuments are in the proximity of the SOP interventions. Grade I, II* and II listed building are also located in proximity to many of the SOP interventions, therefore direct and setting impacts are considered likely. It is anticipated that using mitigation measures, the direct impacts of the SOP interventions and setting impacts will be minimised.

The impacts of the SOP interventions on non-designated heritage assets, unknown archaeological remains and historic landscape character are unknown at this stage. The SOP interventions may have some adverse effects on these, either direct or on their setting.

5.2.4 Biodiversity

Several SOP interventions fall within or near nature conservation sites protected at European, national and local levels. Interventions which have the potential to affect European designated wildlife sites are outlined below:

- Delivery of Segregated HGV bypass Lanes between M6 J. 16-19 is near of Midland Meres and Mosses Phase 2 Ramsar Site.
- Junction improvements on the A54 between M6 J.18 and Kelsall are adjacent to Oak Mere SAC and Midland Meres and Mosses Phase 2 Ramsar Site.
- Extension of Knowsley Expressway (A5300) to the south of the A562, is near the Mersey Estuary SPA/Ramsar Site.
- Proposed new road from A494 to A55 passes through the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid (Wales) SAC.
- Localised junction improvements between A49 and Wrexham on the A534 passes through River Dee and Bala Lake and River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid (Wales) SAC.
- A51 Nantwich Dual Carriage Way is near River Dee and Bala Lake SAC.
- Proposed Nantwich Southern Bypass is near Midland Meres and Mosses Phase 1 Ramsar Site and West Midland Mosses SAC.

These schemes would cause potential impact to the qualifying attributes and integrity of these sites. It is anticipated that with mitigation the impacts of these schemes can be minimised.

Other SOP interventions are located within the proximity of European protected sites, and therefore have the potential to cause indirect adverse impacts on these sites. These impacts may be through the loss of supporting functional habitat, visual disturbance, noise or air pollutant emissions. The nature of these impacts is unknown currently, however pose a risk of impact to the qualifying attributes of these sites.

At a national level, protected sites including SSSIs, National Nature Reserves and RSPB Reserves, would be potentially affected by several the SOP interventions, due to direct and indirect impacts. Several of the interventions are located within or adjacent to the SSSIs, and therefore present a risk to the integrity of these sites. This includes the proposed measure to extend the B5210 to the A56, proposed new road from A494 to A55, localised improvements between A49 and Wrexham on the A534, A494 upgrade from M56/M53 across River Dee to A55 and the widening of A483 between Jn. 4-6. Many other SOP interventions involving existing road improvements and new links are in proximity of SSSIs however it is anticipated that any impacts or losses can be minimised through mitigation measures.

Many of the SOP interventions are near ancient woodland, and therefore there is a risk of loss or disturbance to this habitat. Through appropriate route selection and mitigation measures it is anticipated that any impacts or losses can be minimised.

Several the SOP interventions are near Local Nature Reserves including the extension of Knowsley Expressway (A5300) to the south of the A562 and Dual Carriageway with grade-separation on A500 M6 J16 to Stoke. As such there is the potential for degradation of the characteristics of these sites.

The rail interventions would have negligible effect on biodiversity apart from potential localised impacts associated with the Manchester to Skelmersdale (via Wigan) service frequency enhancement, which is near several Local Nature Reserves including Greenslate Water Meadows, Borsdane Wood, Hall Lee Bank Park and Pretoria Pit. The increase in the frequency of trains has the potential for degradation and disturbance on the characteristics of these sites.

As well as causing adverse effects on biodiversity, there are also opportunities for the SOP interventions to include enhancements. This can include looking at opportunities to consider strategic biodiversity priorities, considering Biodiversity Action plans and other local authority policies and strategies. This may include the planting of native species and developing wildflower meadows along the linear infrastructure. TfN will continue to work with Natural England, local authorities, environmental stakeholders and local communities to discuss and agree the appropriate enhancement measures and actions for this.

5.2.5 Water Environment

The SOP interventions fall within the catchment of several main rivers and ordinary watercourses, these schemes have the potential to contribute to pollution of surface water. As well as improvements to existing infrastructure, the SOP interventions include several new road links and rail links. With appropriate mitigation, it is anticipated that the impact of the SOP interventions on the water quality of the watercourses will be negligible. Through the potential improvement to and the upgrade of existing draining systems, there may be enhancement opportunities associated with the SOP interventions.

Several groundwater bodies may be affected by the SOP interventions. Several of the interventions are located within groundwater source protection zones, including the A5036 Princess Way (Access to Port of Liverpool) full grade separation of junction, A580 upgrade at M6 J23 and westwards to the A579 and localised junction improvements between A49 and Wrexham on the A534, which all fall within or near of source protection zone 1 (inner protection zone). These schemes and other SOP interventions present a risk to the chemical quality of the protected and non-protected aquifers within the SDC. Using appropriate mitigation, it is anticipated that there would be a negligible impact on the chemical quality of groundwater from the schemes.

Most of the SOP interventions fall within flood zone 2 or 3, or both at certain locations along their routes. The extent at which the flood zones intersect these interventions is generally limited, therefore using appropriate mitigation the interventions will not adversely affect floodplains or increase flood risk to sensitive receptors.

6. Environmental Policy Appraisal

A review of policy against which the SOP has been appraised is presented in Appendix C.

The interventions considered for the SOP have been appraised against the environmental policies for each of the environmental topics, where a risk-rating has been applied for any conflicts or opportunities, according to the following criteria:

- Likely to have significant adverse environmental effects;
- Potential to have significant adverse environmental effects; and
- Unlikely to have any significant adverse environmental effects.

Table 10: Summary of the assessment of environmental policy

Topic	Policy conflicts and environmental risk/opportunities - commentary	Risk rating
Noise	<p>The SOP interventions risk conflicting with NPPF and NPSE and policy 10 of the Greater Manchester Transport Strategy 2040 through the proposed construction of several new road links.</p> <p>The SOP interventions also provide the opportunity to comply with policy aims to avoid significant adverse noise impacts on health and quality of life through proposed bypasses, particularly around Nantwich and Holmes Chapel diverting traffic from urban areas improving overall townscape.</p> <p>The rail SOP interventions have the potential to comply with Policy 10 of the Greater Manchester Transport Strategy 2040 as an increase in services on existing lines has the potential to encourage use of public transport.</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>	Potential to have significant adverse environmental effects
Air Quality	<p>The SOP interventions risk conflicting with NPPF and policy 10 of the Greater Manchester Transport Strategy 2040 with many of the proposed interventions passing through existing AQMAs. However, the construction of these new road links has the potential to have a positive effect on the reduction of emissions in urban areas.</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>	Potential to have significant adverse environmental effects
Greenhouse Gases	<p>The SOP interventions would lead to an increase in carbon emissions would risk conflicting with United Nations Framework Convention on Climate Change (UNFCCC) agreement, NPPF and Greater Manchester regional policies, all which emphasis a move towards a reduction in carbon emissions.</p> <p>TfN will continue to work with local authorities, Highways England and communities, looking at genuine alternative transport options and opportunities for sustainable transport solutions. This will include measures to stimulate the update of electric vehicles.</p>	Potential to have significant adverse environmental effects

Topic	Policy conflicts and environmental risk/opportunities - commentary	Risk rating
Landscape and Townscape	<p>The SOP includes improvement schemes near of the Peak District National Park which has potential to change views from this designated area. Impacts risk conflicting with NPPF and NPSNN in relation to National Parks. The SOPs are not anticipated to affect any AONBs.</p> <p>The interventions also risk adverse impacts on landscape character of national character areas, conflicting with planning policy relating to the protection of valued landscapes particularly of NCA61, NCA60, NCA62 and NCLA13 in which interventions may cumulatively or in isolation degrade the characteristics of these areas.</p> <p>The construction of the proposed Skelmersdale rail link risks conflicting with the Greater Manchester Transport Strategy 2040 as the proposed route has the potential to negatively impact upon flood risk and townscape in the area.</p> <p>TfN will continue to work with local authorities, environmental stakeholders and communities to discuss and agree mitigation strategies for all potential interventions.</p>	Potential to have significant adverse environmental effects
Historic Environment	<p>The SOP interventions are not anticipated to impact upon the Liverpool Maritime Mercantile City World Heritage Site which is located within the SDC. The interventions risk affecting several designated heritage assets of national value. The proposed segregated HGV Bypass lanes between M6 J.16-19 falls within close proximity of Tabley House Grade II park and garden, and improvements on the A536 between Macclesfield and Congleton falls within close proximity of Gawsorth (old) Hall Grade II* park and garden. These schemes risk slight adverse impacts on the features of these heritage assets. It is anticipated that using mitigation measures, the direct impacts of the SOP interventions and setting impacts will be minimised.</p> <p>TfN will continue to engage with Historic England, local authorities and communities to discuss and agree mitigation strategies for all potential interventions.</p>	Potential to have significant adverse environmental effects
Biodiversity	<p>Several of the interventions have the potential for adverse impacts on European designated sites, SSSI, national nature reserves and RSBP reserves and will require a design which mitigates or compensates for any impacts to comply with the requirements of the Habitats Directive.</p> <p>TfN will continue to work with Natural England, local authorities, environmental stakeholders and local communities to discuss and agree the appropriate enhancement measures and actions for this.</p>	Likely to have significant adverse environmental effects
Water Environment	<p>SOP interventions fall within the catchment of several main rivers and water courses which have the potential to contribute to the pollution of surface water, including existing infrastructure and new road links. With the use of appropriate mitigation, the impact on water quality will be negligible.</p> <p>The SOP includes schemes which fall within flood zones which have the potential to alter floodplains or increase flood risk. Using appropriate mitigation these interventions will not adversely affect floodplains or increase flood risk to sensitive receptors.</p> <p>TfN will continue to work with the Environment Agency, local authorities and communities to agree and discuss mitigation strategies for all potential interventions.</p>	Potential to have significant adverse environmental effects

7. Integrated Sustainability Appraisal (ISA) Objectives Appraisal

7.1 ISA Objectives

An ISA Framework has been defined, consisting of a series of objectives, against which the sustainability performance of the STP has been assessed. These ISA Objectives are presented in Table 11.

As stated in Section 3.3 of this report, only ISA objectives relating to the environmental topics are listed in WebTAG unit A3 have been appraised, although the potential impact of the SDC on the other objectives has been acknowledged in line with the assessment undertaken within ISA. The objectives for which the SOP interventions have been appraised against are indicated in Table 11.

Table 11: ISA Objectives

Objective No.	Objective	SOP Appraisal undertaken
1	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	
2	Protect and enhance biodiversity, geodiversity and the green infrastructure Network	
3	Conserve and enhance the international sites (HRA specific objective)	
4	Protect and enhance air quality	
5	Increase resilience of the transport network to extreme weather events and a changing climate	X
6	Protect and enhance the inland and coastal water environment	
7	Protect and conserve soil and remediate / avoid land contamination	X
8	Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	
9	Protect and enhance the character and quality of landscapes and townscapes	
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	X
11	Enhance lower carbon, affordable transport choice	
12	Enhance long term economic prosperity and promote economic transformation	X
13	Coordinate land use and strategic transport planning across the region	X
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	X
15	Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	X
16	Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	X

7.2 Appraisal of SOP Against ISA Objectives

The interventions considered for the SOP have been appraised against the ISA objectives for each of the environmental topics, using the assessment aid questions in Appendix D, and the assessment scale in Table 12.

Table 12: 5-point scale for assessment of SOP against the ISA objectives

Assessment Scale	Assessment Category
+	Beneficial
0	Neutral
-	Adverse
?	Uncertain
+/-	Combination of beneficial and adverse

Table 11 presents the appraisal of the SOP scenarios against the ISA objectives.

Table 11: Summary of the assessment of SOP against the ISA objectives

No	Objective	Assessment	Commentary
1	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	-	Based on road transport only, the SOP interventions include the creation of several new road links and bypasses which will promote the use of private cars. The rail SOP interventions may offset some of this increase. Overall the net effect of the interventions will be to increase greenhouse gas emission.
2	Protect and enhance biodiversity, geodiversity and the green infrastructure network	-	The SOP interventions fall within or near of a European, national and regional protected sites and priority habitats having the potential to affect the integrity and status of these. It is assumed that the interventions will be delivered in accordance with the Highways Biodiversity plan requirement of no net biodiversity loss. The SOP comprises of improvements to existing highway infrastructure, following the proposed works this may present opportunities to enhance the environmental performance of this infrastructure. Opportunities for the SOP interventions to include enhancements including looking at opportunities to consider strategic biodiversity priorities, Biodiversity action plans and planting of native species and developing wildflower meadows along the linear infrastructure.
3	Conserve and enhance the international sites (HRA specific objective)	-	The SOP interventions have the potential to affect several European designated wildlife sites which have the potential to impact upon the qualifying attributes and integrity of these sites. This may include visual disturbance, noise and air pollutant emissions and loss of supporting functional habitats. The need to undertake a HRA and provide appropriate mitigation or compensation will minimise and adverse impacts and provide the potential for enhancements.

No	Objective	Assessment	Commentary
4	Protect and enhance air quality	-	<p>The SOP interventions include the creation of several new road links and bypasses which will promote the use of private cars. The interventions have the potential to negatively impact upon existing air quality management areas.</p> <p>The increase in the frequency of services in the rail SOP interventions have the potential to cause negative impacts through an increase in services where air quality management areas are present, associated with the use of diesel-powered trains.</p>
5	Increase resilience of the transport network to extreme weather events and a changing climate	?	<p>Insufficient scheme design information available to assess the performance of the SOP against this objective. Please refer to the ISA for assessment of the STP.</p> <p>However, many of the SOP interventions fall within flood zone 2 or 3 or both, at certain locations along their routes. It is anticipated that the interventions will not adversely affect floodplains or increase flood risk.</p>
6	Protect and enhance the inland and coastal water environment	-	<p>The SOP interventions fall within the catchment several main rivers and water courses and have the potential to contribute to transport related pollution of surface water. SOP interventions provide the potential for improvement to and upgrade of existing drainage systems.</p>
7	Protect and conserve soil and remediate / avoid land contamination	-	<p>The impact of the SOP on soils and contaminated land has not been considered in the environmental appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP includes interventions located within greenfield land some of which may be Best and Most Versatile. The SOP is anticipated to result in some loss of agricultural soils through encroaching transport infrastructure. There is however the potential for the SOP to lead to the remediation of contaminated land.</p>
8	Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	-	<p>The SOP interventions fall within proximity of many heritage assets and is therefore anticipated to have both direct and setting impacts on heritage assets of both national and local value. Using appropriate mitigation measures many of the impacts can be minimised. However, the SOP would improve access to the Liverpool Maritime Mercantile City World Heritage Site.</p>
9	Protect and enhance the character and quality of landscapes and townscapes	-	<p>The interventions are not located in the proximity of AONB's, the proximity of interventions to the Peak District National Park is unlikely to have an impact on the setting with the use of appropriate mitigation. The use of embedded mitigation in the design of the SOP interventions has the potential to provide landscape enhancements.</p> <p>Several of the SOP interventions fall within settlements have the potential to impact on the physical and social characteristics of urban environments. Where SOP interventions draw traffic from existing settlements it is anticipated that these would have a locally beneficial impact on townscapes through a reduction in traffic flows therefore improving characteristics such as appearance.</p>

No	Objective	Assessment	Commentary
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	+	<p>Insufficient scheme design information is available at this time to assess the performance of the SOP against this objective. Please refer to the IS for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the West and Wales SDC has a medium rate of recycling relative to other SDCs, it is anticipated that meeting this objective would provide slight beneficial effects.</p>
11	Enhance lower carbon, affordable transport choice	-	<p>The SOP interventions include the creation of several new road links and bypasses and highway infrastructure improvements will promote the use of private cars, and therefore will not enhance the use of lower carbon transport options.</p> <p>The rail transport SOP interventions includes an increase in the frequency of services, and extension of services which has the potential to reduce the dependency on private cars and enhance public transport availability.</p>
12	Enhance long term economic prosperity and promote economic transformation	+	<p>Economic performance of the SOP has not been considered in this environmental appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessments made in Table H-6 of the ISA; the SOP is anticipated to support economic growth in line with the STP enhancing long term economic prosperity.</p>
13	Coordinate land use and strategic transport planning across the region	+	<p>Coordination of land use and strategic transport planning has not been considered in this environmental appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP interventions are the implementation of a new strategic approach of more effective delivery of major infrastructure. As stated in Table H-6 the size of the SDC and number of local authorities should make coordination easier.</p>
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	+	<p>Equality impact assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP will strengthen connectivity between densely populated economic centres enhancing access to a wide range of services and jobs benefitting those who may have previously had poor access.</p>
15	Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	?	<p>Health impact assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, the SOP interventions are anticipated to result in increases in vehicles and HGVs which may have some negative effects on communities.</p>

No	Objective	Assessment	Commentary
16	Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	+	<p>Community safety assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP.</p> <p>However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP interventions are anticipated to improve the perception of community safety and reduce the fear of crime.</p>

8. Summary

This Environmental Appraisal Report provides an overview of the potential environmental implications of the Strategic Outline Programme (SOP) of the West and Wales Strategic Development Corridor (SDC) and how the environmental considerations have been considered.

The transport network off the West and Wales SDC will undergo significant changes because of the SOP, including the creation of new roads and bypasses, road improvements, and several localised rail improvements (including more train services, improvements in journey time, a new link to Skelmersdale and a new park and ride station. These interventions will create increases in road induced noise and carbon emissions and a decrease in air quality. With the anticipated move in the medium to long term to electric vehicles and improvements in road vehicle fuel efficiencies, these adverse effects will be offset.

In addition, the Rail interventions have been reported in the Rail SPOC (which considers rail interventions in all the SDC areas) to encourage some modal change from road to rail, which will have a small beneficial effect. With the future consideration of more regional interventions, including a change to electric trains, further benefits would be achieved.

The SOP includes road improvements that are near environmental designations and resources, therefore local environmental impacts are anticipated. These impacts include potential adverse impacts on landscape and townscape characteristics, and risk of direct impacts to the setting of cultural heritage assets. The SOP also has the potential for impacts on other designations of national and local value, including ecological networks and registered parks and gardens.

It is anticipated that the environmental impacts can be mitigated or avoided through further environmental assessment and option development. In some cases, opportunities for environmental enhancements can be identified. Following this process majority of the SOP interventions are likely to comply with the relevant national and regional policies and contribute to the objectives established in the Integrated Sustainability Appraisal (ISA).

Interventions proposed through this study will be taken forward through other separate commissions to Strategic Outline Business Case (SOBC) in line with the Department for Transport's Transport Business Case approach. This will include more detailed consideration of individual interventions or groups of interventions, for which appropriate WebTAG compliant environmental appraisal will take place. Subsequently, any schemes will undergo further environmental assessment through the Highways England Project Control Framework (PCF) process, local authority or Nationally Significant Infrastructure planning consent processes. This is likely to include an Environmental Impact Assessment (EIA) for many of these schemes, a process that will lead to production of an Environmental Statement (ES) to be submitted with any application for development consent. The environmental impacts of these schemes will inform the consenting authority's decision.

9. Glossary

Term	Description
Air Quality Management Area (AQMA)	Areas where a Local Authority expect air quality objectives are not likely to be achieved are required to be designated as an Air Quality Management Area.
Ancient Woodland	Ancient woodland is defined as an area that has been wooded continuously since at least 1600 AD.
Appraisal Specification Report (ASR)	A report documenting the methodology and scope of appraisal, including proposed approach to modelling and forecasting and methodology for assessing sub-impacts to be presented in the AST. The principles of the ASR are encompassed within the final SPOC document.
Appraisal Specification Summary Table (ASST)	A table used to set out proposed appraisal methodologies for each of the challenges or sub-impacts in the AST.
Appraisal Summary Table (AST)	A table summarising the outputs of a WebTAG compliant appraisal.
Area of Outstanding Natural Beauty (AONB)	An area of countryside designated for protection through legislation and planning policy for its high landscape value.
Combined Modelling and Appraisal (ComMA) Report	A document encompassing the Transport Forecasting Report and Economic Assessment Report, as well as the principles of other contributory products to the delivery of the overall West and Wales SPOC.
Community Safety Assessment (CSA)	An assessment undertaken to ensure that a scheme, strategy or policy does not have a detrimental impact on community safety (including crime and road safety) and where possible improves the existing situation.
Design Manual for Road and Bridges (DMRB)	Documents containing information about current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads, including motorways.
Environmental Appraisal Report (EAR)	For the purpose of this study, the EAR is a document reporting the appraisal of environmental effects of the Strategic Development Corridor.
Equality Impact Assessment (EqIA)	An assessment designed to ensure that a policy, project or scheme does not discriminate against any disadvantaged or vulnerable people.
Governance for Railway Investment Projects (GRIP)	A management and control process developed by Network Rail for delivering projects on the operational railway.
Health Impact Assessment (HIA)	A combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.
Integrated Sustainability Appraisal (ISA)	A process for assessing the social, economic and environmental impacts of a plan, with the aim to ensure that sustainable development is at the heart of the plan-making process. The ISA of the STP combines several assessments, including SA/SEA, HIA, EqIA, CSA and HRA.

Term	Description
Intervention	A potential (loosely defined) scheme which would deliver a benefit.
Listed Building	A building or structure recorded on a statutory list for its special architectural and historic interest.
Local Nature Reserve	A site of local importance for wildlife, geology, education or public enjoyment.
Main River	Main rivers are usually larger streams and rivers, and are defined as a watercourse shown as such on the Flood Map for Planning (Rivers and Sea).
National Character Area (NCA)	NCAs divide England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity.
National Nature Reserve (NNR)	Nature conservation designation of national importance established to protect sensitive features and to provide 'outdoor laboratories' for research.
National Park	Areas of relatively undeveloped and scenic landscape that are designated under the National Parks and Access to the Countryside Act.
National Planning Policy Framework (NPPF)	A document that sets out government's planning policies for England and how these are expected to be applied.
National Policy Statement for National Networks (NPSNN)	A document that sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England.
Noise Important Area (NIA)	Areas where the 1% of the population that are affected by the highest noise levels from major roads are located according to the results of the strategic noise mapping.
Northern Powerhouse Independent Economic Review (NPIER)	Report commissioned by the TfN partners collaborating with the wider Northern Powerhouse partnership, to understand the scale, nature and causes of the North's gaps, distinctive 'capabilities' and future growth prospects for the area.
Option Appraisal Report (OAR)	A contributory Product containing an early sift of Interventions that is encompassed within the findings of the SPOC
Outline Business Case (OBC)	A business case document that builds upon an SOBC (if undertaken) but concentrates on detailed assessment of the options to find the best solution. Includes full economic and financial appraisals and selection of a preferred option.
Pollution Climate Mapping (PCM)	A collection of models designed to fulfil part of the UK's EU Directive (2008/50/EC) requirements to report on the concentrations of particular pollutants in the atmosphere.
Project Control Framework (PCF)	A joint Department for Transport and Highways Agency approach to managing major projects; draws together assorted legal requirements, standards and good practice into one easy to follow framework.

Term	Description
Registered Battlefield	Historic England's Register of Historic Battlefields identifies 46 important English battlefields.
Registered Park and Garden	A park or garden recorded on a statutory list for its special landscape, architectural and historic interest.
Scheduled Monument	A nationally important archaeological site or historic building.
Site of Special Scientific Interest (SSSI)	A nationally important site designated for its special nature conservation or geological interest.
Special Area of Conservation (SAC)	Areas of protected habitats and species as defined in the Habitats Directive (92/43/EEC).
Special Protection Area (SPA)	Sites classified in accordance with Article 4 of the Birds Directive (79/409/EEC). They are classified for rare and vulnerable birds (as listed on Annex 1 of the Directive), and for regularly occurring migratory species.
Strategic Development Corridor (SDC)	Each corridor represents an area where evidence suggests investment in transport infrastructure will enable transformational economic growth.
Strategic Environmental Assessment (SEA)	A systematic decision support process, aiming to ensure that environmental aspects are considered effectively in policy, plan and programme making.
Strategic Outline Business Case (SOBC)	A business case document setting out the justification for a scheme, and evidence base for decision making, with content and a level of detail less than an OBC.
Strategic Outline Case (SOC)	A business case document that sets out the justification for the programme of interventions, and evidence base for decision making, with content and a level of detail less than an SOBC.
Strategic Outline Programme (SOP)	A programme of interventions at an early stage of development and a low level of detail.
Strategic Programme Outline Case (SPOC)	A business case document combining the SOP and SPOC, as produced for the West and Wales SDC
Strategic Transport Plan (STP)	Transport for the North's 30-year vision for transport investment in the North of England, which explains the need for investment in transport across the North, identifies the priority areas for improved connectivity and identifies pan-northern transport objectives which need to be realised to enable transformational economic growth.
Sub-Corridor	Geographic corridors within the SDC which serve both discreet functions as inter-urban links between important economic centres, and as a constituent part of "pan-northern" links on strategic routes.
Sustainability Appraisal (SA)	An appraisal of the economic, environmental, and social effects of a plan from the outset of the preparation process to allow decisions to be made that accord with sustainable development.
Transport for Greater Manchester (TfGM)	The public body responsible for co-ordinating transport services throughout Greater Manchester.

Term	Description
Transport for the North (TfN)	Partnership of public and private sector representatives working with central government and national transport bodies to develop and deliver strategic transport infrastructure across the North of England.
Water Framework Directive (WFD)	European Union directive which commits member states to achieve good qualitative status of all water bodies.
WebTAG	The Department for Transport's website for guidance on the conduct of transport studies
World Heritage Site	A place that is listed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as of special cultural or physical significance.

Appendix A. Environmental Baseline

Noise

The Department for Environment, Food and Rural Affairs (Defra) undertakes noise mapping for environmental noise sources including roads, rail, aviation, agglomerations and industry under the Environmental Noise Directive (Directive 2002/49/EC). This requires member states to prepare and publish, every five years noise maps and noise management action plans. The outputs of this noise mapping help to identify Noise Important Areas (NIAs).

The main source of noise in West and Wales SDC is derived from road traffic associated with strategic roads. There are also several locations where the strategic railway routes are also a source of noise. There are 1343 NIAs throughout West and Wales SDC, listed in Table 13. The location of these is shown in 9. These are mainly located within urban areas, including Manchester, Liverpool, Warrington, Chester, Crewe, Congleton, Derby, Stoke and associated with the major roads, including M60, M62, M55 and M55. There are also NIA's associated with the strategic railway routes between Manchester and Liverpool, Manchester and Leeds and Manchester and Midlands.

Table 13: NIAs within West and Wales SDC

NIA ID	Responsible Authority	Source
10621, 10622, 10623, 10624, 10650, 10654, 10710, 10725, 12107, 12108, 1318, 1319, 1320, 1329, 1330, 1331, 1334, 1335, 1336, 1337, 1366, 1367, 1371, 1372, 1373, 1374, 1375, 1377, 1378, 1379, 1390, 1714, 6936, 6978, 8252	Bolton	Road
10708	Bolton & Bury	Road
10709, 10711, 10719, 10720, 10721, 10722, 10723, 10724, 10937, 10957, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1668, 1670,1672, 1673,1674, 1708,1743, 1744, 1748, 6971	Bury	Road
10806, 10819, 10820, 10822, 10823, 10824, 10825, 10826, 10827, 10828, 10829, 10830, 10831, 10832, 10833, 10834, 10835, 10836, 10837, 10838, 10839, 10840, 10841, 10847, 10851, 10852, 10853, 10854, 10855, 10856, 10857, 10858, 10859, 10862, 10863, 10864, 10941, 10997, 11011, 11012, 11013, 11014, 11015, 11016, 11037, 11044, 11045, 11046, 11047, 11048, 11106, 11107, 11108, 11109, 11110, 11112, 11113, 12072, 12073, 12081, 1512, 1513, 1515, 1516, 1517, 1521, 1522, 1523, 1524, 1897, 1898, 1899, 7156, 7157, 7162, 7163, 7164, 7172, 7173, 7174, 7175, 7177, 7188, 7189, 7190, 7200, 7201, 7202, 7203, 7204, 7230, 7231, 7232, 7235, 7236, 7237, 7238, 7239, 7241, 7242, 7243	Cheshire East	Road
7227	Cheshire East & Stockport	Road
10778, 10780, 10781, 10782, 10784, 10842, 10843, 10844, 10845, 10846, 10848, 10849, 10850, 10860, 10861, 10865, 10866, 10867, 10868, 10872, 10874, 10875, 10876, 10877, 10878, 10938, 10939, 10940, 11028, 11030, 11031, 11032, 11033, 11034, 11035, 11036, 11040, 11041, 11042, 11043, 11103, 11104, 11105, 12080, 39, 40, 41, 42, 43, 45, 47, 57,, 7011, 7015, 7023, 7024, 7029, 7030, 7031, 7032, 7033, 7035, 7037, 7039, 7040, 7041, 7046, 7047, 7049, 7050, 7052, 7053, 7144, 7145, 7146, 7148, 7149, 7150, 7151, 7152, 7153, 7154, 7155, 7159, 7160	Cheshire West	Road
11629, 11630, 11631, 11632, 11633, 11634, 11635, 11636, 11637, 11638, 11639, 11640, 12083, 7980, 7981, 7982, 7984, 7988, 7993, 7994, 7996, 7999, 8002, 8003	City of Derby	Road
10993, 10994, 10995, 10996, 11002, 11619, 11621, 11623, 11624, 11625, 11626, 12082	Derbyshire	Road
10998	Derbyshire & Cheshire East	Road

NIA ID	Responsible Authority	Source
10637, 10687, 10718, 10767, 10770, 10777, 10779, 10783, 10797, 10805, 10816, 10934, 10935, 10985, 11, 11008, 11009, 11111, 11172, 11197, 11618, 11620, 11627, 12079, 12120, 1376, 1404, 1405, 1406, 1411, 1443, 1445, 1450, 1451, 1454, 1469, 1470, 1472, 1474, 1475, 1482, 1495, 1496, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1541, 1549, 1571, 1574, 1593, 1596, 1603, 1624, 1635, 1644, 1645, 1660, 1707, 1719, 1723, 1731, 1754, 1755, 1912, 1917, 1930, 1937, 1939, 1942, 1944, 1945, 1946, 1947, 38, 462, 463, 465, 466, 467, 472, 491, 5, 50, 522, 56, 564, 6912, 6918, 6919, 6937, 6938, 6940, 6952, 6955, 6957, 6958, 6960, 6961, 6962, 6963, 6964, 6965, 6966, 6969, 6972, 6973, 6974, 6976, 6988, 6992, 6993, 6994, 6995, 6996, 6998, 6999, 7000, 7001, 7004, 7008, 7009, 7012, 7013, 7017, 7018, 7019, 7020, 7021, 7034, 7036, 7042, 7043, 7057, 7058, 7059, 7061, 7066, 7079, 7087, 7090, 7110, 7111, 7112, 7114, 7115, 7118, 7119, 7120, 7121, 7123, 7124, 7133, 7134, 7135, 7137, 7138, 7140, 7141, 7142, 7143, 7165, 7166, 7167, 7168, 7169, 7170, 7178, 7179, 7184, 7185, 7186, 7187, 7191, 7192, 7197, 7208, 7209, 7210, 7211, 7212, 7213, 7214, 7217, 7218, 7219, 7220, 7221, 7222, 7223, 7224, 7247, 7248, 7249 7250, 7252, 7254, 7256, 7258, 7259, 7262, 7263, 7264, 7265, 7266, 7328, 7422, 7976, 7985, 7986, 7991, 7992, 8004, 8005, 8006, 8007, 8008, 8009, 8010, 8011, 8012, 8014, 8015, 8017, 8018, 8019, 8020, 8021, 8022, 8023, 8162, 8184, 8188, 8190, 8191, 8192, 8195, 8197, 8198, 8202, 8203, 8204, 8206, 8209, 8232, 8251	Highways England (HE)	Road
10655, 10726, 1368	HE & Bolton	Road
1671	HE & Bury	Road
11010	HE & Cheshire East	Road
11628, 8245	HE & City of Derby	Road
7136	HE & Halton	Road
1647	HE & Manchester	Road
1661	HE & Manchester & Oldham	Road
1738	HE & Oldham	Road
10638	HE & Rochdale	Road
1437, 1479, 1713	HE & Salford	Road
10984, 1550	HE & Stockport	Road
1933, 1943	HE & Stoke	Road
10975, 10977, 10992, 1572	HE & Tameside	Road
7089	HE & Warrington	Road
10661	HE & Wigan	Road
10879, 10880, 11029, 7063, 7064, 7065, 7075, 7076, 7077, 7078, 7127, 7128, 7129, 7130, 7131, 7132, 8233	Halton	Road
10786, 10787, 10788, 10790, 10791, 515, 516, 517, 519, 520, 538, 539, 563, 7002, 7003, 7005, 7060	Knowsley	Road
495, 562	Knowsley & Liverpool	Road
10785, 7054	Knowsley & St. Helens	Road
10695, 10696, 10697, 10698, 6997	Lancashire	Road

NIA ID	Responsible Authority	Source
10753, 10754, 10755, 10756, 10757, 10758, 10759, 10760, 10761, 10762, 10789, 12097, 13908, 485, 490, 493, 494, 497, 498, 499, 501, 504, 505, 507, 508, 509, 510, 511, 512, 513, 514, 540, 541, 543, 546, 551, 552, 554, 556, 557, 558, 559, 561, 566, 568, 569, 570	Liverpool	Road
500	Liverpool & Sefton	Road
10959, 10960, 10961, 10962, 10963, 10964, 10966, 10967, 10972, 10978, 12074, 1494, 1497, 1498, 1542, 1543, 1546, 1556, 1557, 1558, 1559, 1560, 1561, 1599, 1601, 1611, 1612, 1648, 1649, 1650, 1652, 1653, 1662, 1663, 1665, 1666, 1667, 1675, 1676, 1677, 1685, 1686, 1688, 1689, 1690, 1691, 1694, 1697, 1698, 1700, 1722, 1739, 1741, 1756	Manchester	Road
1643	Manchester & Oldham	Road
1752	Manchester & Salford	Road
10973, 10974, 1610	Manchester & Tameside	Road
10588, 10589, 10590, 10591, 10593, 10594, 10635, 10636, 10639, 10641, 10642, 10643, 10644, 10645, 10969, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1625, 1630, 1631, 1632, 1633, 1634, 1636, 1637, 1640, 1642, 1646, 1751, 1753	Oldham	Road
RL_1, RI_10, RI_1076, RI_11, RI_1107, RI_1108, RI_1109, RI_1110, RI_1111, RI_1112, RI_1113, RI_1114, RI_1115, RI_1117, RI_1118, RI_1119, RI_1120, RI_1121, RI_1122, RI_1123, RI_1124, RI_1125, RI_1126, RI_1127, RI_1128, RI_1129, RI_1130, RI_1131, RI_1132, RI_1133, RI_1134, RI_1135, RI_1136, RI_1137, RI_1138, RI_1139, RI_1140, RI_1141, RI_1142, RI_1143, RI_1144, RI_1145, RI_1146, RI_1147, RI_1148, RI_1149, RI_1150, RI_1151, RI_1152, RI_1153, RI_1154, RI_1155, RI_1156, RI_1157, RI_1158, RI_1159, RI_1160, RI_1161, RI_1162, RI_1163, RI_1164, RI_1165, RI_1170, RI_1171, RI_1172, RI_1454, RI_1461, RI_1462, RI_2, RI_283, RI_284, RI_285, RI_286 RI_294, RI_295, RI_296, RI_297, RI_298, RI_299, RI_3, RI_300, RI_301, RI_303, RI_304, RI_305, RI_306, RI_307, RI_308, RI_309, RI_310, RI_311, RI_312, RI_313, RI_314, RI_315, RI_316, RI_317, RI_340, RI_4, RI_5, RI_63, RI_64, RI_65, RI_66, RI_68, RI_687, RI_69, RI_692, RI_695, RI_697, RI_698, RI_7, RI_70, RI_705, RI_71, RI_730, RI_731, RI_733, RI_735, RI_8, RI_9	Network Rail	Rail
10586, 10587, 10640, 10712, 10713, 10714, 10715, 10716, 10717, 12078, 1401, 1402, 1403, 1408, 1422, 1429, 1430, 1431, 1432, 1433, 1434, 1473, 1476, 1478, 1641, 1655, 1656, 1658, 1659, 1715, 1717	Rochdale	Road
10727, 10728, 10729, 10730, 10731, 10936, 10958, 10965, 1357, 1359, 1360, 1362, 1364, 1365, 1380, 1436, 1438, 1439, 1440, 1441, 1442, 1444, 1447, 1448, 1449, 1452, 1453, 1455, 1456, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1471, 1480, 1483, 1501, 1502, 1503, 1679, 1680, 1681, 1705, 1745, 7215	Salford	Road
1358	Salford & Wigan	Road
10683, 10684, 10685, 10686, 10688, 10751, 10752, 468, 471, 473, 474, 475, 476, 477, 479, 480, 482, 483, 486, 487, 488, 489, 492, 565, 6911, 6913, 6914	Sefton	Road
10699, 10700, 10746, 10747, 10748, 10792, 10793, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 567, 7055, 7056, 7068, 7070, 7071, 7072	St. Helens	Road
1111, 11133, 11134, 11171, 11173, 11174, 11175, 11176, 11177, 11178, 11179, 11180, 11181, 11184, 11185, 11186, 11187, 11188, 11190, 11191, 11195, 11196, 11617, 1900, 1901, 1902, 1903, 1911, 1913, 1914, 1915, 1918, 1919, 1953, 1954, 7251, 7269, 7270, 7271, 7272, 7273, 7274, 7275, 7276, 7277, 7283, 7330, 7331, 7332, 7333, 7424	Staffordshire	Road
1974	Staffordshire & Stoke	Road

NIA ID	Responsible Authority	Source
10814, 10815, 10817, 10818, 10821, 10979, 10980, 10981, 10982, 10983, 10986, 10999, 11000, 11001, 12071, 1518, 1519, 1525, 1526, 1527, 1528, 1533, 1534, 1535, 1538, 1539, 1540, 1547, 1548, 1552, 1554, 1555, 1563, 1564, 1565, 1566, 1567, 1724, 1749	Stockport	Road
11115, 11130, 11131, 11132, 1905, 1906, 1907, 1908, 1909, 1910, 1916, 1920, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1931, 1932, 1934, 1935, 1936, 1938, 1940, 1948, 1949, 1951, 1952, 1956, 1957, 1958, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1976	Stoke	Road
10595, 10596, 10597, 10598, 10970, 10971, 10976, 10987, 10988, 10989, 10990, 10991, 1569, 1570, 1575, 1577, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1594, 1606, 1607, 1608, 1609, 1728, 1729, 1733	Tameside	Road
10810, 10811, 10812, 10813, 10968, 11007, 1459, 1460, 1461, 1484, 1485, 1486, 1487, 1488, 1490, 1491, 1492, 1493, 1504, 1720, 1721	Trafford	Road
10735, 10736, 10737, 10738, 10739, 10740, 10794, 10795, 10796, 10798, 10799, 10800, 10801, 10802, 10803, 10804, 10807, 10808, 10809, 10881, 10882, 11017, 11018, 11019, 11020, 11021, 11022, 11023, 11024, 11025, 11026, 11027, 7073, 7083, 7084, 7085, 7088, 7091, 7092, 7093, 7094, 7095, 7098, 7100, 7102, 7104, 7105, 7106, 7107, 8196	Warrington	Road
10626, 10662, 10663, 10664, 10665, 10666, 10667, 10668, 10669, 10701, 10702, 10703, 10704, 10705, 10706, 10707, 10732, 10733, 10734, 10741, 10742, 10743, 10744, 10745, 10749, 10750, 12096, 1339, 1340, 1341, 1342, 1344, 1346, 1348, 1353, 1354, 1355, 1356, 1709, 1711, 6920, 6981, 6983, 6984, 6987, 6989, 7125, 7126, 8189, 8194	Wigan	Road
1, 10, 10763, 10764, 10765, 10766, 10768, 10769, 10771, 10772, 10773, 10774, 10775, 10776, 10942, 12, 13, 14, 15, 16, 17, 18, 19, 2, 23, 25, 26, 27, 28, 3, 30, 31, 32, 33, 34, 4, 48, 52, 58, 6, 7, 7006, 7007, 7010, 8, 9	Wirral	Road

Air Quality

Although there have been improvements in air quality, there are still large parts of the UK impacted by poor air quality. This includes areas within the West and Wales SDC, this is notably surrounding urban areas and major road networks. The main source of air pollution in West and Wales SDC is road traffic emissions from major roads.

Local authorities have been assessing local air quality since 1997 to ensure that national air quality objectives are achieved, these include levels for Particulate Matter, Nitrogen dioxide, Ozone and Sulphur dioxide. Where these levels are not met, it is the responsibility of the Local Authority to declare an Air Quality Management Area (AQMA). There are 39 AQMAs located within the West and Wales SDC, these are listed in Table 14. The location of these are shown on Figure 9. These are primarily associated with urban areas, including Manchester, Liverpool, Warrington, Chester, Crewe, Congleton, Derby, Stoke and associated with the major roads, including M60, M62 and M55.

Table 14: AQMAs within West and Wales SDC

AQMA ID	Title of AQMA	AQMA ID	Title of AQMA
1362	Earl Street Crewe	642	Knutsford AQMA
1367	Halton AQMA No 2	643	Macclesfield AQMA
1365	Halton Widnes No 1	1484	AQMA No.4 (Reflection Court)
126	Stoke on Trent Air Quality Management Order 2011	1478	Wistaston Road Crewe AQMA
590	Newton High Street AQMA (No.2)	1483	AQMA No.3 (Borough Rd)

AQMA ID	Title of AQMA	AQMA ID	Title of AQMA
490	Nantwich AQMA	211	Liverpool City AQMA
20	Derby NO2 AQMA No.1: Ring Roads	775	Kidsgrove - Number 1
176	Derby PM10 AQMA	1585	Newcastle-under-Lyme Town - Number 2
477	Derby NO2 AQMA No.2: A52	1587	AQMA Number 4 - Little Madeley
64	Warrington AQMA No.1	1586	AQMA Number 3 - Maybank, Wolstanton, Porthill
291	Whitby Rd/Station Rd AQMA	1599	Frodsham AQMA Cheshire West and Chester
284	Congleton AQMA No.4 (The A34 and A54)	999	Greater Manchester AQMA
282	Congleton AQMA No.2 (West Road, Congleton)	1629	AQMA 5
281	Congleton AQMA No.1 (Cranage)	1628	AQMA 4
547	Congleton AQMA No.5 (Lower Heath)	603	AQMA 2
548	Congleton AQMA No.6 (Sandbach)	604	AQMA 3
550	Chester Road AQMA	1634	Thornton le Moors AQMA No. 4
576	Nantwich Road AQMA (Crewe)	1657	Chester City Centre AQMA (No.5)
589	M6 AQMA (No.1)	1667	Warrington AQMA No.4 2016
641	Disley AQMA		

Greenhouse Gases

Greenhouse gases, primarily carbon dioxide (CO₂) from combustion of fossil fuels, are a primary contributor towards climate change.

Transport sector is a significant contributor of greenhouse gases. Domestic emissions of road transport accounts for around a quarter of UK Greenhouse Gas Emissions, 93% of these emissions occur from road transport. Carbon dioxide (CO₂) emissions are of relevance to a changing climate and are emitted using combustion engines and result from the production of materials used in infrastructure.

Carbon emissions across the UK vary, with Wales, The North West and West midland contributing 7%, 11% and 9% respectively.

Within these regions there are variations in CO₂ emissions between areas as illustrated in Figure 11. Figure 11 shows the CO₂ emissions per capita for the different local authority regions, considering road transport (A roads) and diesel railways.

Landscape and Townscape

The landscapes and townscapes across West and Wales SDC vary greatly ranging from estuaries, and low-lying farmland to developed conurbations. The SDC area is primarily developed covering densely developed areas of Greater Manchester conurbation, as well as important cities such as Liverpool, Chester, Stoke-on-Trent, Derby, St Asaph and Bangor.

England and Wales have been divided into several National Character Areas (NCAs) and National Character Landscape Areas (NCLAs). The boundaries of the NCAs and NCLAs follow natural lines in landscape oppose to administrative boundaries. Within the West and Wales SDC there are 31 NCAs and NCLAs, which are shown on Figure 10.

Natural England have produced a series of profiles which describe the landscape of the area, history, geodiversity, biodiversity, and cultural and economic activity which contributes to the overall character of the area. The main character areas for West and Wales SDC, potential affected by the SOP interventions, are listed in Table 15.

The West and Wales SDC contains Areas of Outstanding Natural Beauty (AONBs), which is a statutory designation given to protect the land to conserve and enhance its natural beauty a World Heritage site, listed for the cultural role played for the development of one of the world’s major trading centres in the 18th and 19th centuries. Associated with the West and Wales SDC are two AONBs and three world heritage sites. These are:

- Bryniau Clwyd a Dyffryn Dyfrdwy/Clwydian Range and Dee Valley AONB;
- Ynys Mon/Anglesey AONB;
- Liverpool – Maritime Mercantile City world heritage site;
- The Castles and Town Walls of King Edward in Gwynedd world heritage site; and,
- Derwent Valley Mills world heritage sites.

The various characteristics of a landscape can contribute to a landscape character. Characteristics including cultural heritage, tranquillity, landcover and landscape pattern vary between and within the West and Wales SDC.

Table 15: National Landscape Character Areas within West and Wales SDC

National Character Areas	Description
NCA 32 – Lancashire and Amounderness Plain	This NCA is an area of high-grade agricultural land made up of a series of low-lying landscape types from undulating lowland farmland in the east and coastal marshes and dunes in the west. It is bounded to the east by the Bowland fringe, to the north by Morecambe Bay and Liverpool to the south.
NCA55 – Manchester Conurbation	This NCA is predominantly urban area bringing together several large settlements. Manchester Pennine Fringe wraps around the conurbation to the east and north. Mersey valley NCA lies to the west and Shropshire, Cheshire and Staffordshire plain to the south.
NCA56 – Lancashire Coal Measures	This NCA surrounds the towns of St Helens and Wigan and extends from the Mersey Valley NCA in the south to the Lancashire and Amounderness Plain NCA in the north-west. It is surrounded by the Manchester Conurbation and Manchester Pennine Fringe NCAs to the east and the Merseyside Conurbation NCA to the south west.
NCA58 – Merseyside Conurbation	This NCA is predominantly urban and suburban landscape centred on Liverpool and Birkenhead extending north towards the Sefton Coast NCA and south to the Wirral NCA. It is abutted by the Lancashire and Amounderness Plain NCA to the north-east, Lancashire Coal Measures NCA to the east and the Mersey Valley NCA to the east and south-east.
NCA59 – Wirral	This NCA occupies a peninsula formed from the Mersey and Dee estuaries. The area is a rich pastoral landscape interspersed with settlements. The Shropshire, Cheshire and Staffordshire Plain NCA lies to the south east. The Merseyside Conurbation NCA and Mersey Valley NCA are adjacent to the Wirral NCA.
NCA60 – Mersey Valley	This NCA is characterised by low-lying landscape, the valley has a dense communication network with motorways, roads, railways and canals running east-west. Major towns located in the NCA include Runcorn, Widnes and Warrington.
NCA 61- Shropshire, Cheshire and Staffordshire Plain	This NCA covers the majority of Cheshire East and is characterised by gently rolling countryside interspersed with sandstone ridges. The significant settlements of Macclesfield, Congleton and Crewe all lay within this area. The predominant land use is pastoral farming.
NCA62 - Cheshire Sandstone Ridge	This NCA occupies a narrow strip of and running roughly north-south. The area is surrounded on three sides by the Shropshire, Staffordshire and Cheshire Plain and borders the Mersey Valley NCA to the north. The

National Areas	Character	Description
		area contains no significant settlements but several smaller villages. The land is generally agricultural in nature though of a lower quality than the surrounding plain.
NCA 64 – Potteries and Churnet Valley		This NCA exhibits a strong contrast between industrialised landscape of the Potteries and the pastoral, dissected hills and small plateaux that flank the Churnet and Dove valleys. It is bounded to the north and east by the limestone landscape of the White Peak and South West Peak NCAs.
NCA 68 – Needwood & South Derbyshire Claylands		This NCA is predominantly a rolling plateau that slopes from the southern edge of the Peak district to the valley of the River Trent in the south-west. The NCA is bounded the Trent Valley of the Trent Valley Washlands NCA and the rising ground of the Cannock Chase and Cank Wood NCA in the south-west. The Shropshire, Cheshire and Staffordshire Plain NCA forms part of the boundary to the west with the Potteries and Churnet Valley NCA to the north-west. It is bounded to the north and north-east but the White peak, and Derbyshire Peak Fringe & Lower Derwent NCAs.
NCA 69 – Trent Valley Washlands		This NCA is a distinctly narrow and linear landscape which, at its widest around Derby, is only about 9 km wide but has a total length close to 100 km. It adjoins 13 other NCAs and extends through Warwickshire, Staffordshire, Derbyshire, Nottinghamshire and Leicestershire. It is strongly defined by its watercourses which all provide multifunctional links with the upstream and downstream NCAs of the Trent catchment.
NCLA13 – Deeside and Wrexham		This NCLA covers a border area extending from the mouth of the Dee to Point of Ayr and inland to the Ceiriog Valley. It is an industrial and commercial landscape with traditional architecture and countryside. It is bordered by the Maelor NCLA.
NCLA14- Maelor		This NCLA protrudes into the Cheshire plain to the west of the River Dee bordering the counties of Shropshire and Cheshire. Characterised by floodplains and rolling lowland and a rural agricultural character.

Historic Environment

Throughout the West and Wales SDC there are a large amount of heritage assets, including Registered Parks and Gardens, Scheduled Monuments, Listed Buildings a World Heritage site and historic battlefields. Table 16 below summarises the total designated assets in the SDC area, which are shown on Figure 8.

Table 16: Designated Heritage Assets in West and Wales SDC

Designation	Grade / Period	Number
Listed Buildings	Grade I	281
	Grade II*	940
	Grade II	12,706
World Heritage sites	-	3
Registered Parks and Gardens	-	144
Scheduled Monuments	-	344
Registered Battlefields		4

The Liverpool – Maritime Mercantile City, the Castles and Town Walls of King Edward in Gwynedd and Derwent Valley Mills are designated as a World Heritage site. Schedule Monuments are located throughout the SDC area and are located uniformly spread throughout the southern half of the SDC with slight clustering around Chester and Aldford, Mold and Kelsall. The Registered Park and Gardens are also located throughout the SDC area, and are located within Greater Manchester, throughout Cheshire East, around the urban areas of Derby, Stoke, Crewe and Chester. The historic battlefields are located around the urban areas of Warrington, Chester and Nantwich. The listed buildings are located through the SDC area, with a particularly high concentration within all the urban areas.

Biodiversity

Within the West and Wales Strategic Development Control (SDC) area, there are many internationally, nationally and locally designated sites of nature conservation importance.

Table 7 below lists the designated nature conservation sites in West and Wales SDC. The location of these is shown in Figure 8.

Table 17: Designated nature conservation sites within each SMU

Type of Designations	List of sites	Total number	
RAMSAR	Ribble & Alt Estuaries Mersey Estuary The Dee Estuary Mersey Narrows & North Wirral Foreshore	Midland Meres & Mosses - Phase 1 Midland Meres & Mosses Phase 2	8
Special Protected Area (SPA)	Mersey Estuary Ribble & Alt Estuaries The Dee Estuary Mersey Narrows & North Wirral Foreshore	Peak District Moors (South Pennine Moors Phase 1) Liverpool Bay Anglesey Terns / Morwenoliaid Ynys Mdn Ynys Seiriol / Puffin Island Traeth Lafan / Lavan Sands, Conway Bay Glannau Ynys Gybi / Holy Island Coast	10
Special Area of Conservation (SAC)	Dee Estuary Rochdale Canal Sefton Coast River Dee and Bala Lake Oak Mere Manchester Mosses South Pennine Moors Rixton Clay Pits Alyn Valley Woods / Coedwigoedd Dyffryn Alun	Coedwigoedd Dyffryn Elwy / Elwy Valley Woods Coedwigoedd Penrhyn Creuddyn / Creuddyn Peninsula Woods Coedydd Aber Corsydd Mon / Anglesey Fens Dee Estuary / Aber Dyfrdwy Deeside and Buckley Newt sites Eryri / Snowdonia Glannau Mon: Cors heli / Anglesey Coast: Saltmarsh Glannau Ynys Gybi / Holy Island Coast Great Orme's Head / Pen y Gogarth Halkyn Mountain / Mynydd Helygain Johnstown Newt Sites Llyn Dinam River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid Y Fenai a Bae Conwy / Menai Strait and Conwy Bay Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes	26
Sites of Special Scientific Interest (SSSI)	Abbots Moss Abram Flashes Alderley Edge Ashclough Astley & Bedford Mosses Bagmere Betley Mere Bickerton Hill Black Firs & Cranberry Bog Breadsall Railway Cutting Brookheys Covert Brookhouse Moss	Warburton's Wood and Well Wood Hallwood Farm Marl Pit Linmer Moss Bryn Marsh & Ince Moss Flood Brook Clough Frodsham Railway and Road Cuttings Gleads Moss Bar Mere Oak Mere Holcroft Moss Ffynnon Beuno and Cae Gwyn Caves Gatewen Marsh Glannau Penmon – Biwmares Glannau Porthaethwy Glannau Rhoscolyn Glannau Ynys Gybi: Holy Island Coast Glaswelltiroedd Trelogan/Trelogan Grasslands Graig Fawr	191

Type of Designations	List of sites	Total number	
Sites of Special Scientific Interest (SSSI)	Cotteril Clough	Old River Dove, Marston on Dove	Gronant Dunes and Talacre Warren
	Danes Moss	Hollinwood Branch Canal	Gwenfro and Rhos y Gad
	Flaxmere Moss	Maer Pool	Hendre Bach
	Dee Cliffs	Dunsdale Hollow	Herward Smithy
	Dee Estuary	Nob End	Inner Marsh Farm
	Ford Green Reedbed	Dane-in-Shaw Pasture	Llanddulas Limestone and Gwrych Castle Wood
	Forest Banks	The Dungeon	Llay Bog
	Dunham Park	Tonge River Section	Llyn Bodgylched
	Dibbinsdale	Stanley Bank Meadow	Llyn Llywenan
	Holly Banks	Witton Lime Beds	Llyn Maelog
	Heswall Dales	Chapel Mere	Llyn Padrig
	Highfield Moss	Lindow Common	Llyn Traffwl
	Hilton Gravel Pits	Compstall Nature Reserve	Llyn y Fawnog
	Ladcastle & Den Quarries	Dee Cliffs, Farndon	Llynnau y Fali- Valley Lakes
	Hulme Quarry	River Dee	Maes Hiraddug
	Inner Marsh Farm	Baswich Meadows	Maes y Grug
	Kedleston Park	Boulton Moor	Malltraeth Marsh/Cors Ddyga
	New Ferry	Huddersfield Narrow Canal	Mariandyrus
	Lowside Brickworks	Dark Peak	Moel Hiraddug a Bryn Gop
	Ludworth Intake	Rixton Clay Pits	Morfa Uchaf, Dyffryn Conwy
	Meols Meadows	Hatch Mere	Mynydd Marian
	Madams Wood	Sandbach Flashes	Mynydd y Flint/ Flint Mountain
	Mersey Estuary	Aber Afon Conwy	Newborough Warren – Ynys Llanddwyn
	Mersey Narrows	Alyn Valley Woods and Gorge Caves	Old Pulford Brook Meadows
	Metallic Tileries, Park House	Arfordir Gogleddol Penmon	Parc Bodlondeb and Gwenallt-parc, Lixwm
	Matley Moor Meadows	Baron Hill Park	Parc Linden, Lixwm
	Oakhanger Moss	Beddmanarch-Cymyran	Pen y Gogarth/ Great Ormes Head
	Peckforton Woods	Benar Bryn Eurynth Wood	Pen-y-Cefn Pasture
	Pettypool Brook Valley	Buckley Claypits and Commons	Porth Diana
	Norbury Meres	Bwrdd Arthur	Prestatyn Hillside
	North Wirral Foreshore	Cadnant Dingle	Puffin Island – Ynys Seiriol
	Plumley Lime Beds	Caeau Talwrn	Rhoscolyn Reedbed
	Rochdale Canal	Caeau Tyddyn Dicwm	Rhosneigr Reefs
	Red Brow Cutting	Cefn Meadow	Rhosydd Llanddona
	Red Moss	Chwareli a Glaswell Tir	Shotton Lagoons and Reedbeds
	Red Rocks	Degannwy	Sontley Marsh
	Rostherne Mere	Coed Ffordd-Las	Stryt Las a'r Hafod
	Risley Moss	Coed Gorswen	Sychnant Pass
	River Dane	Coed Trefraith	
	Sefton Coast	Coed y Gopa	
	Tatton Meres	Coedydd Aber	
	Thurstaston Common		
	Ravenhead Brickworks		
	Raw Head		

Type of Designations	List of sites	Total number
	The Mere, Mere	Coedydd ac Ogofau Elwy a Traeth Lafan
	Tabley Mere	Meirchion Traeth Pensarn
	Wimboldsley Wood	Comin Helygain a Tre Wilmot
	Wetley Moor	Glaswelltreffynnon/Halkyn Tyddyn-y-Barcut
	Wybunbury Moss	Common and Holywell Tywyn Aberffraw
	Woolston Eyes	Grasslands Vicarage Moss
	Black Lake, Delamere	Connah's Quay ponds and woodland Waun Eurad
	Beechmill Wood and Pasture	Cors Bodeilio Y Werthyr
	Doxey and Tillington Marshes	Cors Bodwrog Ynys Feurig
	Hatton's Hey Wood, Whittle's Corner and Bank Rough	Cors Erddreiniog Coedydd Afon Menai
	King's and Hargreaves Woods	Cors Goch Marford Quarry
	Wettenhall and Darnhall Woods	Cors y Farl Moelyci a chors tygöñ y Caeau
		Craig Wen/Cors Castell
		Creigiau Rhiwledyn/Little Ormes Head
		Creuddyn
		Eithinog
		Eryri

The designated nature conservation sites are distributed throughout the West and Wales SDC. SSSI sites are distributed through the SDC, although there is large concentration around Greater Manchester and along the north Wales, Wirral and Liverpool coast line. The Ramsar, SPA and SAC sites are generally located along the north Wales, Wirral and Liverpool coastlines.

There are also six Royal society for the Protection of Birds (RSPB) and 8 Important Bird Areas, associated with the north Wales, Liverpool and Wirral coast line, and the river Dee and Mersey estuaries. There are also 10 National Nature Reserves also located along the north Wales, Liverpool and Wirral coast line, and the river Dee and Mersey estuaries.

The importance of non-statutory sites as well as statutory sites is recognised in the Government's Biodiversity Framework (Defra, 2012) and in the National Planning Policy Framework (DCLG, 2018).

There are 162 Local Nature Reserves (LNR) scattered through the West and Wales SDC, although similar to SSSIs, there is large concentration around Greater Manchester and along the north Wales, Wirral and Liverpool coast line. LNRs contain valuable habitats such as ancient woodland, species-rich grassland and bogs. Many provide a refuge for rare and threatened plants and animals. LNRs form an irreplaceable part of our environment and are a major part of the strategy to conserve the biological richness with the West and Wales SDC.

The SDC contains areas of woodland areas which have been continuously wooded since 1600AD in England and Wales, termed Ancient Woodland. Ancient Woodland is present across much of the SDC corridor.

There are a wide range of habitats and species found within the SDC. Semi-natural habitats and those most threatened and requiring conservation have been identified as 'priority habitats' under the UK Biodiversity Action Plan (BAP). The priority habitats are reasonably well distributed throughout the West and Wales SDC. Cheshire BAP identifies 217 priority habitats, Greater Manchester BAP 12, North Merseyside BAP 28 and Denbighshire BAP 20 priority habitats respectively. Habitats include lowland and upland heathlands, meres, wood-pasture and parkland. There are numerous protected species found within the SDC including Great Crested Newt, Water Vole, Bats, Barn Owl and badgers.

Water environment

Within West and Wales SDC, the water environment is represented by many rivers, estuaries, streams and brooks, and groundwater. The two main rivers are the River Dee in Wales and River Mersey. Both watercourses form part of the Dee and North West River Basin Management Plans (RBMP) (Environment Agency, 2009). In addition, to the two main rivers, the significant watercourses with the West and Wales SDC are River Irwell, River Calder, River Croco and River Weaver. Associated with these watercourses there are 261.4km² of flood zone 2 or 3.

There 24 important groundwater bodies with in West and Wales SDC. Associated with these there are source protection zones grade 1-3 (where zone 1 is the inner zone, zone 2 is the outer zone and zone 3 is the total catchment zone). These are distributed throughout, but are mainly located south of Manchester, around Warrington, north of Crewe, south of Chester and around Stoke.

A.1 Environmental Baseline Figures

Figure 8: Environmental Constraints: Ecology, Landscape and Heritage Features

Figure 9: Environmental Constraints: Air Quality, Noise and Water Environment Features

Figure 10: National Character Areas

Figure 11: Emissions of CO2 by Local Authority Area

FIGURE 8

Legend

- Corridor Extents
- National Character Area
- Important Bird Area
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- RSPB Reserve
- Area of Outstanding Natural Beauty (AONB)
- RAMSAR Site
- BAP Priority Habitats (England Only)
- Scheduled Monuments
- World Heritage Sites (Castle)
- World Heritage Sites
- Historic Battlefields
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Registered Parks and Gardens
- Ancient Woodland
- National Parks



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 ECOLOGY, LANDSCAPE AND HERITAGE FEATURES
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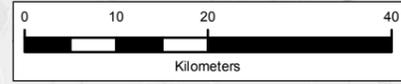
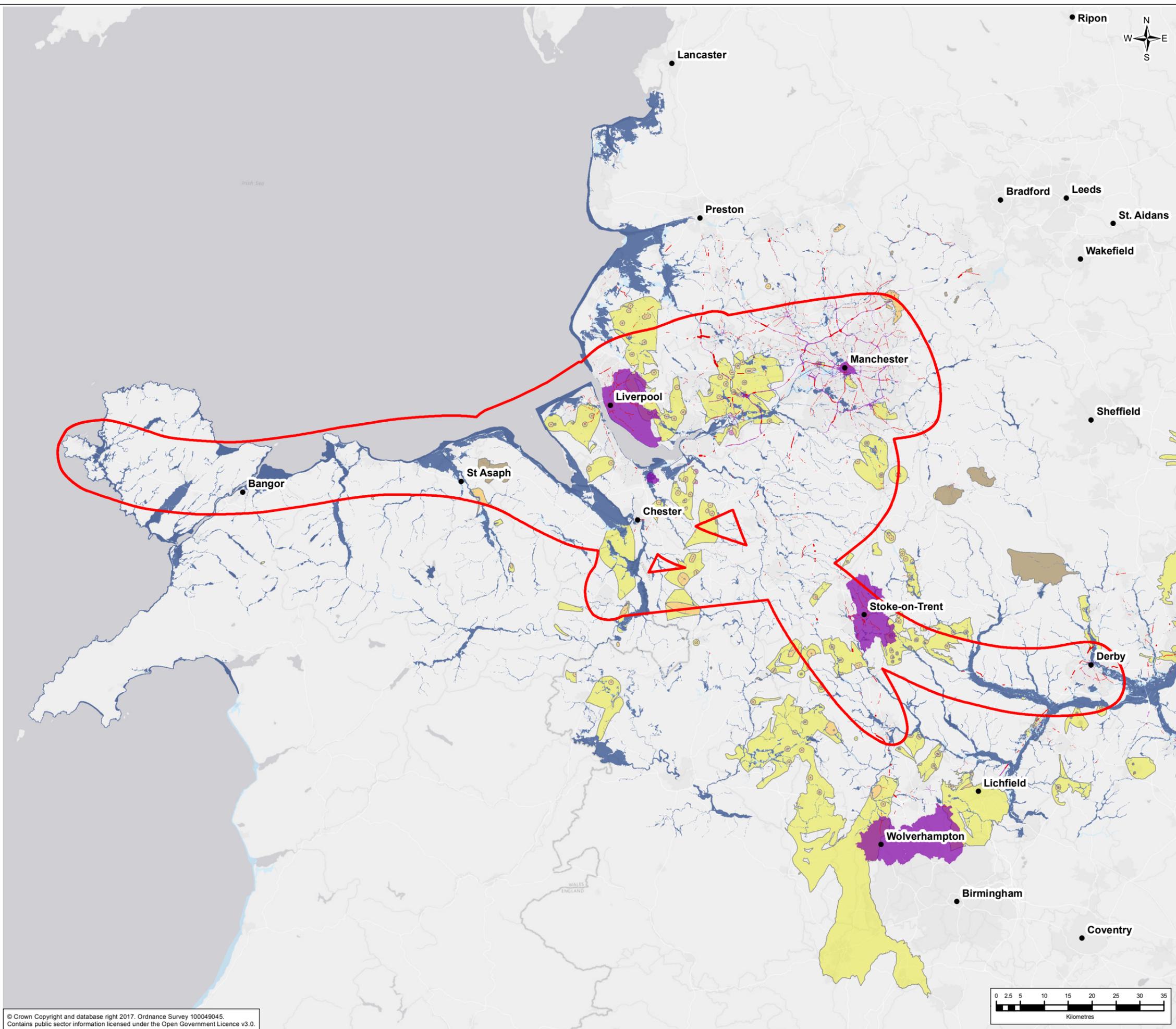


FIGURE 9

- Legend**
- Sub-Corridors
 - City
 - Noise Important Area
 - Air Quality Management Area (England)
 - Flood Zone 2
 - Flood Zone 3
- Groundwater Source Protection Zone**
- 1
 - 1c
 - 3
 - 2
 - 2c



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WEST AND WALES STRATEGIC CORRIDOR

Drawing Title
**ENVIRONMENTAL CONSTRAINTS:
 AIR QUALITY, NOISE AND WATER ENVIRONMENT FEATURES
 (STRATEGIC DEVELOPMENT CORRIDOR SUB-CORRIDOR)**

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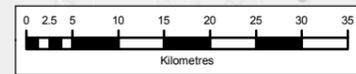
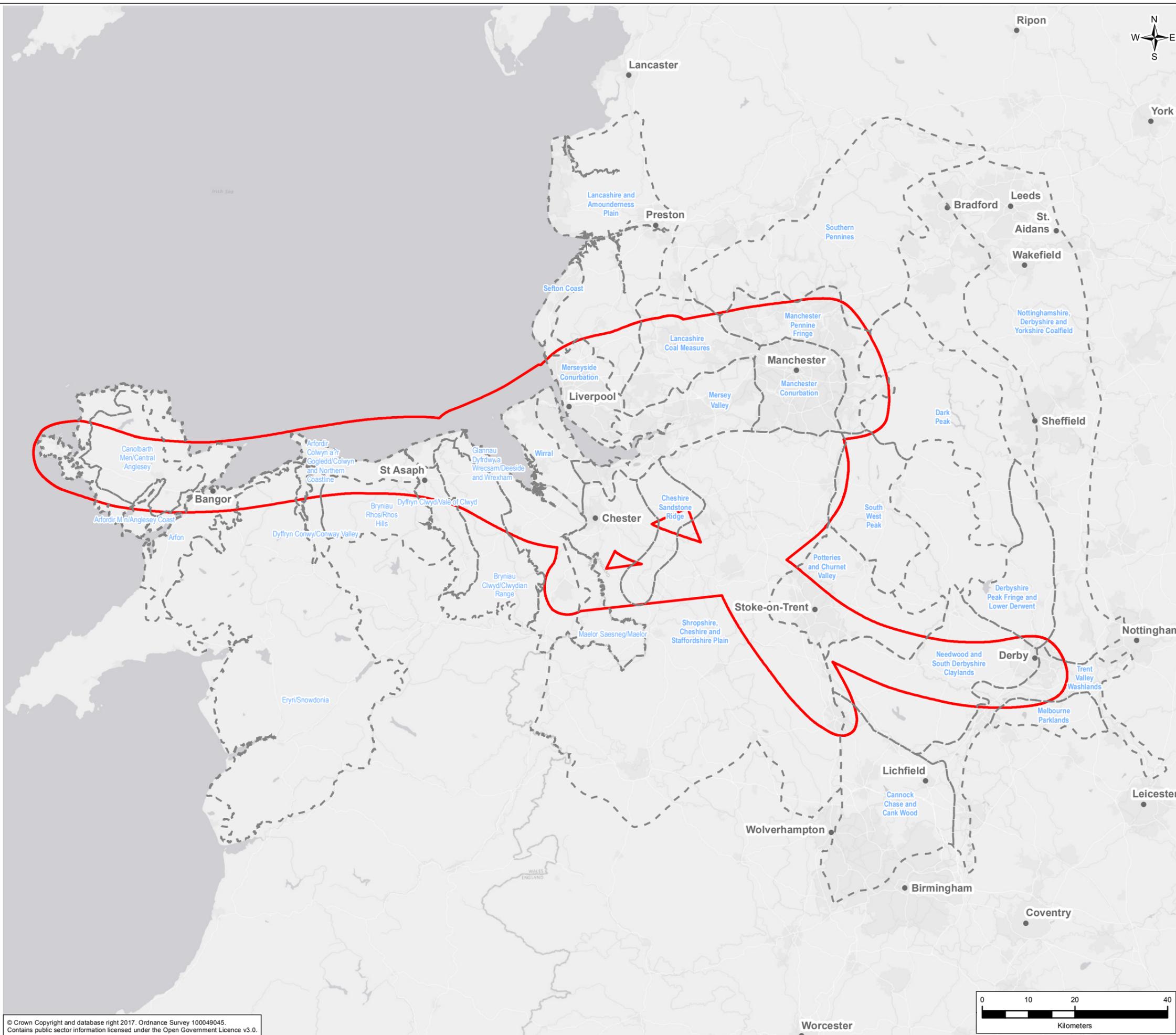


FIGURE 10

- Legend**
- Corridor Extents
 - National Character Area



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Drawing Title
**NATIONAL CHARACTER AREAS
 (STRATEGIC DEVELOPMENT CORRIDOR SUB-CORRIDOR)**

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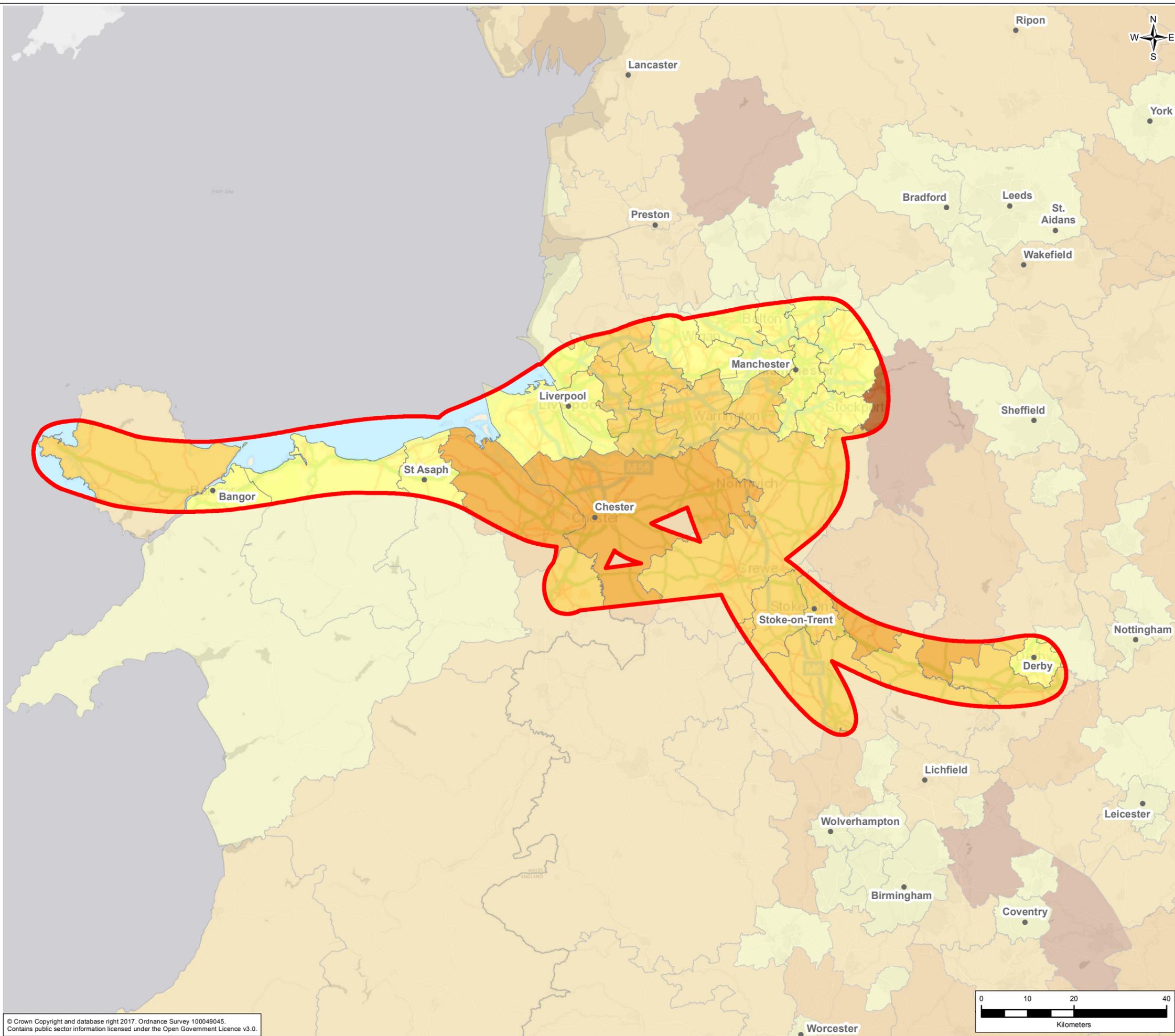
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FIGURE 11

Legend

- Corridor Extents
- Tonnes of CO2 per capita (2016)**
- < 5.2
- 5.2 - 7.7
- 7.7 - 12.9
- 12.9 - 32.6



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**EMISSIONS OF CO2 BY LOCAL AUTHORITY AREA
 (STRATEGIC DEVELOPMENT CORRIDOR SUB-CORRIDOR)**

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Appendix B. Anticipated Baseline Trends

B.1 Noise

No applicable ISA objective

The major influence on the future noise environment is likely to be the growth planned for the local planning authorities and changes in transport infrastructure and traffic movements. Associated with the identification of noise areas, noise action plans are likely to be required in the future.

In addition, the local authority Local Transport Strategies, aim to achieve a shift towards more sustainable transport modes, reducing congestion. These plans outline major changes to the highways, public transport and walking and cycling facilities. Key road projects offer the opportunity to relieve congestion where noise affects people worst.

- **Short Term:** There are 1343 Noise Important Areas (NIAs) designated along the road and rail network of the West and Wales SDC. NIAs are areas in which 1% of the population are affected by the highest noise levels from major roads. Noise Action Plans have been developed for these NIAs, as the population at these locations are likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life because of their exposure to noise from road and rail traffic. The Action Plans outline approaches to the management of environmental noise issues and effects.
- **Medium Term:** In accordance with the Environmental Noise (England) Regulations 2006, which implements the Environmental Noise Directive in England. Exposure to environmental noise, from major sources of road, rail and aircraft noise and in urban areas will be monitored on a five-year cycle. Noise Action Plans will be adopted based on these results to manage environmental noise and its effects, including noise reduction. New development will include measures to mitigate noise, including low-noise surfacing for highways. The use of electric vehicles and trains will also reduce noise, although wheel and tyre noise will remain.
- **Long Term:** Measures implemented under the Environmental Noise (England) Regulations 2006 are likely to continue to mitigate exposure from environmental noise from roads. The widespread use of noise mitigation measures such as low noise surfacing and use of ULEV, would help reduce noise levels in the long term.

B.2 Air Quality

Adapted from Objective 4 of Appendix D.1 of the ISA

The major influence on the future air environment is likely to be the growth planned for the local planning authorities and changes in transport infrastructure and traffic movements. Many of the Local Authorities have Air Quality Action Plans, which include several either on-going or proposed measures to improve air quality within those areas.

In addition, the local authority Local Transport Strategies along with the Manchester City Centre Clean Air Zones, aim to achieve a shift towards more sustainable transport modes, reducing congestion. These plans outline major changes to the highways, public transport and walking and cycling facilities. Key road projects offer the opportunity to relieve congestion where poor air quality affects people worst.

- **Short Term:** There have been significant improvements in air quality across UK in recent years, but local hotspots remain where National Air Quality Standards are exceeded – particularly in urban areas and along roads. There are 39 AQMAs in this SDC, covering 3.99% of the area. Most road vehicles are anticipated to be fossil fuelled, although some improvements in emissions are expected from engine efficiency and other measures.

- **Medium Term:** Poor air is assumed to be an issue at the local level. This will partially be due to traffic congestion causing localised higher levels of vehicle emissions. To address this issue, the UK has adopted tougher, legally binding targets for national emissions of five damaging air pollutants between 2020 and 2030. During this period, it is anticipated for there to be a growth in the use of ULEVs is expected, as the result of national and regional environmental policies.
- **Long Term:** By 2050 it is anticipated that a high proportion of vehicles will be ULEVs, associated with more widely spread charging points. Rail travel is also anticipated to increase, potential with the introduction of electric trains on some of the railway network. This allied to the growth in ULEVs, would result in a fall in overall pollutant emissions. For the use of ULEVs, there would be other potential environmental issues associated with the recycling and disposal of electric batteries and battery components. Although there are current plans for the electrification of some of the rail network, the use of non-electric trains can have an adverse effect on air quality, particularly around and in stations.

B.3 Greenhouse Gases

Adapted from Objective 1 and 11 of Appendix D.1 of the ISA

Short Term: In the UK transport accounts for approximately a quarter of CO₂ emissions, road transport makes up majority of this source. The overall CO₂ emissions vary between regions, with Wales contributing 7%, North West 11% and West Midland 9%. At present the vast majority of transport modes are traditionally fuelled by hydrocarbons, however between 2005-2016 the UK has seen a decline in CO₂ emissions of 32% and are set to decline further. The Government is working to end the sale of conventional petrol and diesel cars by 2040, progress toward this target has already started with more than 150,000 ULEVs and 14,000 charge points across the UK.

Medium Term: Contributions to the UK's non-traded emissions from road transport is projected to decline by 12% from the 41% recorded in 2016 by 2035 with a move to the use of electric vehicles and improvements in road vehicle fuel efficiencies. As a result, at least 30% of new car sales are expected to be ULEVs by 2030, and possibly as many as 70%. For new vans, up to 40% of sales could be ULEVs by 2030. It should be noted that Government forecasts for road traffic levels are expected to rise between 17% to 51% by 2050 because of increases in population and decreases in vehicle running costs.

Long Term: Over the term to 2050, there is anticipated to be a high fall between 17% to 76% in carbon emissions. To meet the 2050 target almost every car and van will be required to be zero emission by 2050 and significant reductions in emissions from HGVs will be required. Road emission decline is anticipated to be due to increased uptake of ULEVs and grid decarbonisation.

B.4 Landscape and Townscape

Adapted from Objective 9 of Appendix D.1 of the ISA

A variety of changes in the study area will affect the landscape, including built development, climate change (as it affects people's use of the land – e.g. agricultural practice), changes to biodiversity / vegetation and change to the water environment. The effect that climate change has on biodiversity will likewise change the constitution of the landscape. New development has the potential to restore degraded landscapes, but also to be harmful to well-preserved natural or historic landscapes.

- **Short Term:** Landscape and townscape across the West and Wales SDC varies with different landscape types from low lying river valley, mudflats/sand flats to Sandstone Ridge. There is a range of settlement types within the SDC corridor including Greater Manchester conurbation, such as Liverpool and Chester. The SDC is made up of 31 different National Character Areas and National Character Landscape Areas. There are no National Parks within the SDC and only a small number of AONBs. Snowdonia National Park is located just on the western boundary of SDC.

- At present, landscape and townscape within this SDC is negatively affected by transport infrastructure (of all types) and high levels of traffic congestion. This is most frequently associated with the large conurbations and the routes into them, but there are also isolated spots of congestion outside of these areas. New infrastructure would likely represent new features in the landscape and may encroach on areas of open space. In some instances, though, there would be potential for enhancement.
- **Medium Term:** A review of National Parks and AONBs was announced as part of the government 25 Year Environmental Plan to assess whether more may be needed. Therefore, there is the potential for new National Parks or AONBs. Areas currently protected for their landscape would still receive that protection, but new interventions would still represent new features in the landscape. However, screening would reduce adverse effects. There would also be an uptake in vehicles that are quieter and less polluting making enhancement easier to achieve.
- **Long Term:** Those areas currently protected for their landscape would still receive that protection, but any interventions would still represent new features in the landscape. However, screening would reduce adverse effects. There would also continue to be an uptake in vehicles that are quieter and less polluting making enhancement easier to achieve.

B.5 1.5 Historic Environment

Adapted from Objective 8 of Appendix D.1 of the ISA

Individual heritage assets in the SDC area will be subject to their own unique pressures, whether they are from proposed new development, deteriorating air quality, disuse or lack of care and maintenance. Archaeological resources in general are susceptible to harm from new development, as they are often of unknown nature, buried in unknown locations, and can be disturbed by construction processes. Potential negative effects can be minimised, but there are a range of mitigation measures from preservation 'in situ' (within the ground) to preservation by record (i.e. creating a professionally overseen record of the asset prior to, during and after removal).

- **Short Term:** Protected sites represent a total of about 1.7% of the SDC area (64.8km²) and include the Liverpool – Maritime Mercantile City, the Castles and Town Walls of King Edward in Gwynedd and Derwent Valley Mills World Heritage Site, which receives the highest level of protection. While transport infrastructure can affect cultural heritage (including from construction) by direct destruction or effects on setting, protection will continue to be provided to these cultural heritage features and it is likely that new sites will join the list, e.g. through archaeological discovery, or new interpretations of existing sites. The Strategic Transport Plan aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features, e.g. historic railway stations. This SDC is thus considered to be at medium risk of negative effects. However, there is low road use and low growth. Effects are anticipated to be slight beneficial.
- **Medium Term:** Protection of the full range of known sites will continue and it is likely that new sites will join the list e.g. through archaeological discovery, or new interpretations of existing sites. A sensitive approach to enhancing access to sites of historic and cultural importance will improve social awareness and enjoyment without reducing quality and distinctiveness. Effects are anticipated to be slight beneficial.
- **Long Term:** Further development could continue to increase the potential for disturbance to assets and their setting. Protection of known sites will continue, and it is likely that new sites will join the list, e.g. through archaeological discovery, or new interpretations of existing sites. Effects are anticipated to be slight adverse due to medium level road traffic growth.

B.6 1.6 Biodiversity

Adapted from Objective 2 and 3 of Appendix D.1 of the ISA

There are many threats to important habitats and species in the study area, and therefore their future is somewhat uncertain. Of relevance is climate change and resulting changes in weather patterns which will alter features such as water bodies (e.g. seasonal water depth / level for both surface and groundwater) and the mix of plant species in a given location, and therefore habitats. Climate change may alter the characteristics of habitats throughout the SDC which would affect species distribution. This may include the spread of invasive, non-native species. Therefore, invasive species need to be controlled and native habitats and species protected and enhanced, so that they have the flexibility to adapt to climate change.

Maintaining unprotected habitats and finding enough land for habitat creation and enhancement (including minimising habitat fragmentation) will be a difficult challenge in the future, as people also try to cope with population increases, resource constraints and climate change.

- **Short Term:** Short term new transport interventions have the potential to impact on statutory and non-statutory designated sites of ecological or geological value and more generally on the network of linked multi-functional green spaces, comprising the local green infrastructure. These impacts could occur through direct land take for infrastructure (which may also cause fragmentation of habitats and/or notable and protected species populations) and construction and operational disturbance (noise, vibration, light pollution, etc.) and emissions / contamination (air, water and soil). Many of the local authorities within the SDC have produced Biodiversity Action Plans (BAPs) to target priority habitats / species, which require conservation efforts to improve their status / distribution at a local level. However, opportunities could be provided for enhancement of biodiversity – for example through planting of native species.

Natural England condition summary for SSSIs shows that 87.34% of these sites in Greater Manchester, Merseyside and Cheshire are of favourable or unfavourable but recovering status. It should be noted that these sites are subject to pressures from developments resulting in both direct and indirect impacts, for example through increasing transport movements which could increase levels of disturbance; many of the existing designated sites are near transport infrastructure. As such there is a potential for effects (positive and negative) on this from the new / upgraded infrastructure, depending upon the nature and location of the intervention.

- **Medium Term:** Through the EU Biodiversity Strategy, as commitment has been set to halt the loss of biodiversity by 2020 and is supported by the National Policy Planning Framework (NPPF). Section 40 of the Natural Environment and Rural Communities Act 2006 places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. Both Highway England and Network Rail share a similar commitment to halt biodiversity loss and see delivery of long-term benefits for biodiversity. This places a duty on public authorities to have consideration for conserving biodiversity, and for policies to seek to make a significant contribution to meeting the commitments made in the Biodiversity 2020 strategy.

The transport interventions will need to aim to avoid / minimise potential adverse effects through development with an emphasis no net loss of biodiversity and ecosystem services. The requirement of biodiversity net gain may be strengthened in policy in line with the aspirations of the 25-year Environment Plan for thriving plants and wildlife.

It is anticipated that there is a potential for both positive and negative effects depending upon the nature and location of potential interventions.

- **Long Term:** Statutory duties concerning planning policy and commitments to no net loss of biodiversity have the potential to improve the state of nature within the UK. This is in addition to ongoing commitments of no net loss from bodies such as Highways England and Network Rail, along with the Governments 25-year Environment Plan which aims to embed and environmental net gain principle for development, enhance designated sites and create/restore wildlife rich habitats and increase woodland cover,

It is anticipated that application of HRA will highlight any potentially adverse impacts on international designated sites arising from new transport interventions. If adverse impacts cannot be adequately mitigated, then compensatory measures would be required.

There is a potential for both positive and negative effects depending upon the nature and location of potential interventions.

B.7 Water environment

Adapted from Objective 6 of Appendix D.1 of the ISA

There is a range of influences on the future of the water bodies within SDC, including plans and strategies such as the North West and Dee RBMP. The North West RBMP identifies a range of pressures in the wider river basin, including water abstraction, the potential spread of non-native species, rural pollution sources (nitrate, pesticides and phosphate), physical modification of water bodies (e.g. installation of flood risk management assets), sediment from increased soil erosion or other sources, and urban and transport pollution.

Climate change will influence most of the above pressures on the catchment. It will increase pressures from abstraction / flow regulation, pollution levels (rural, urban and transport) and soil erosion.

In the future, flooding will be influenced by climate change, changes in land use (for example urban development) and rural land management. Whilst we do not know exactly what will happen in the future, the key trends are:

- more frequent and intense storms causing more widespread flooding from drainage systems and some rivers; and
- wetter winters increasing the likelihood of large-scale flooding.
- **Short Term:** This SDC is overwhelmingly located within the North West (84% of the SDC) and Dee (16% of the SDC) River Basins, with the Water Framework Directive ensuring there is a good understanding of water management and quality issues in each. For example, in the North West 13% of the River Basin is significantly impacted by pollution from towns, cities and transport. Specific measures are being introduced under the WFD to address water pollution from the transport network, from roads. The use of Sustainable Drainage Systems (SuDS) is also becoming a more standard element to road drainage design.
- **Medium Term:** The measures included for transport schemes under the requirements of WFD will continue. It is anticipated that measures such as these will help improve water quality status in future. It is assumed that WFD legislation transposed in the UK and associated measures to improve water quality will remain after the UK's withdrawal from the European Union.

By 2021 6.3% of surface water bodies in England are expected to improve by at least one ecological status class.

- **Long Term:** It is anticipated that there will be an uptake in Ultra Low Emissions Vehicles (ULEV) within this SDC, which along with the increase in digital connectivity and range of measures promoted under the WFD would help to protect the water environment.

The use of SuDS on new / upgraded transport interventions would also have increased in scale (as per WFD).

Appendix C. Policy Review

C.1 Noise and Vibration

C.1.1 NATIONAL POLICY

National Planning Policy Framework (NPPF)

The main reference to noise within the NPPF is at paragraph 180 which aims to avoid significant adverse noise impacts on health and quality of life because of new development and to mitigate / reduce any impacts to a minimum. The NPPF also refers to the Noise Policy Statement for England and other relevant law.

Noise Policy Statement for England (NPSE)

The NPSE sets out the long-term vision for government policy on noise and aims to avoid / mitigate significant adverse impacts on health and quality of life and contribute to improvement.

National Policy Statement for National Networks (NPSNN)

Paragraph 5.189 states where a development is subject to EIA and significant noise impacts are likely to arise from the proposed development, the applicant should produce a noise assessment, which includes Noise and Vibration baseline, sensitive receptors, predictions of changing in baseline with the proposed development and mitigation measures. Paragraph 5.193 requires developments to be undertaken in accordance with the statutory requirements for noise. Paragraph 5.199 states that for most national network projects, the relevant Noise Insulation Regulations will apply.

Road Investment Strategy (RIS) Policy Paper

Department for Transport has outlined an aspiration for a 90% reduction in the number of people impacted by noise from the SRN by 2040. The RIS identifies a capacity to improve noise levels through the management and redevelopment of Highways England assets, via low noise road surfacing and noise barriers etc. It is expected that Highways England will deliver investigation and mitigation measures to at least 1,150 NIAs, helping to deliver a better quality of life to around 250,000 people by the end of the first road period. All new and improved road schemes will therefore utilise low noise road surfaces as a default, with investigation of noise attenuating barriers and other potential mitigation options, where practicable.

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) "Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment." The Licence in 5.23 (a) goes on to state that it must "Ensure that protecting and enhancing the environment is embedded into its business decision-making processes" and in 5.23 (b) to ensure "best practicable environmental outcomes across its activities."

'A Green Future: Our 25 Year Plan to Improve the Environment'

Although the 25 Year Environment Plan does not have any goals or topics aimed directly at noise, the Plan states "over the next 25 years, we must significantly cut all forms of pollution and ease pressure on the environment. We must ensure that noise and light pollution are managed effectively".

C.1.2 REGIONAL POLICY

Greater Manchester Transport Strategy 2040

Greater Manchester's Transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 8 'we will work with partners to reduce, as far as possible, the emissions from transport, particularly CO₂, NO₂, particulates and noise'.

C.2 Air Quality

C.2.1 NATIONAL POLICY

The Air Quality Strategy (AQS) For England, Scotland, Wales and Northern Ireland (Volumes 1 And 2) July 2007

The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. For construction activities and road traffic emissions, which are a focus of this assessment, the main pollutant of concern is NO₂. In July 2017, DEFRA and the Department for Transport published a UK plan for tackling roadside nitrogen dioxide concentrations.

This plan outlines the issue, the roles and responsibilities for tackling nitrogen dioxide concentrations and actions to be taken. This includes support for low emission freight, funding to accelerate uptake of low emission buses and taxis, more stringent emission testing requirements and support for Clean Air Zones in England. Principles that local authorities should follow when setting up Clean Air Zones in England are outlined in the Clean Air Zone.

In July 2017, DEFRA and the Department for Transport published a UK plan for tackling roadside nitrogen dioxide concentrations. This plan outlines the issue, the roles and responsibilities for tackling nitrogen dioxide concentrations and actions to be taken. This includes support for low emission freight, funding to accelerate uptake of low emission buses and taxis, more stringent emission testing requirements and support for Clean Air Zones in England. Principles that local authorities should follow when setting up Clean Air Zones in England are outlined in the Clean Air Zone Framework.

NPPF

Paragraph 124 of the NPPF requires compliance with EU limit values or national objectives for pollutants, considering the presence of AQMAs and the cumulative impacts on air quality from individual sites in local areas.

The revised NPPF published in 2018 amends the above. Paragraph 181 requires that planning policies and decisions should "sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, considering the presence of AQMAs and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.

Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".

Paragraph 103 states that "The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise

sustainable transport solutions will vary between urban and rural areas, and this should be considered in both plan-making and decision-making.”

NPSNN

The Government's policy with regards to air quality is to: “...bring forward specific works to address existing environmental problems on the Strategic Road Network and improve the performance of the network. This includes addressing areas of poor air quality.” In decision-making, the NPS states that “the Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming compliant; or affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision”.

Road Investment Strategy (RIS) Policy Paper

The Department for Transport has published its Road Investment Strategy for the 2015/16 – 2019/20 Road Period which sets out policies relating to the strategic planning and funding of the road network. A £100 million Air Quality Fund is to be established to deliver air quality improvements for both new and existing schemes.

By 2040 the plan states there will be “Zero breaches of air quality regulations and major reductions in carbon emissions across the network.”

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) “Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment”. Section 5.23

(e & h) it must seek to “minimise carbon emissions” and “other greenhouse gases from its operations and take opportunities to influence road users to reduce the greenhouse gas emissions from their journey choices.”

'A Green Future: Our 25 Year Plan to Improve the Environment'

The 25 Year Environment Plan sets out government action to help the natural world regain and retain good health. The first of the 10 25-year goals of the plan are to achieve ‘clean air’. The plan states that this will be achieved by: “meeting legally binding targets to reduce emissions of five damaging air pollutants...; ending the sale of new conventional petrol and diesel cars and vans by 2040; and maintaining the continuous improvement in industrial emissions...”.

The Plan also seeks to embed a ‘net environmental gain’ principle for development that in the future is expanded more widely from its current use in biodiversity to include wider natural capital benefits, including air quality.

Section 4 Section 2 refers to the Plan's actions to reduce pollution. This includes publishing a new Clean Air Strategy for consultation in 2018.

Clean Growth Strategy

The Clean Growth Strategy sets out policies and proposals that aim to accelerate the pace of “clean growth”, referred to as delivering increased economic growth and decreased emissions. Key policies and proposals in the strategy include ending the sale of new conventional petrol and diesel cars and vans by 2040; support for the uptake of ultralow emission vehicles (ULEV); investment in the electric charging network; support for low

emission taxis and buses; work to enable options to shift freight from road to rail; and investment of public funds in innovation in low carbon transport technology and fuels.

C.2.2 REGIONAL POLICY

Greater Manchester Low-Emission Strategy and Greater Manchester Air Quality Action Plan

Greater Manchester's Low-Emission Strategy sets out priority areas for future investment which will contribute to a reduction of air pollution in Greater Manchester. Actions proposed include measures to stimulate the uptake of Ultra- Low-Emission Vehicles (ULEVs), measures to reduce emissions from Heavy Good Vehicles (HGVs), measures to reduce emissions from buses on key urban corridors, measures to change travel behaviour, investigation of clean air zones and measures to reduce emissions of new development. The strategy also outlines key measures to be taken in specific focus areas, which includes the M60/M62 corridor and major routes into the town centre. Greater Manchester's Air Quality Action Plan sets out actions to improve air quality across Greater Manchester. Actions across the following broad subjects are established: development management and planning

Greater Manchester Transport Strategy 2040

Greater Manchester's Transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 8 'we will work with partners to reduce, as far as possible, the emissions from transport, particularly CO₂, NO₂, particulates and noise'.

C.3 Greenhouse Gases

C.3.1 INTERNATIONAL POLICY

The UK is a signatory of the United Nations Framework Convention on Climate Change (UNFCCC) which drives international action on climate change. The UK has pledged to reduce GHG emissions under the Paris Agreement, as a part of a joint pledge by members of the European Union (EU). This provides an overarching commitment by the UK.

C.3.2 NATIONAL POLICY

UK Climate Change Act

The Climate Change Act 2008 established the world's first long term legally binding framework to tackle the dangers of climate change¹⁰. A key provision was the setting of legally binding targets for GHG emission reductions of at least 80% by 2050 and at least 26% by 2020, against a 1990 baseline.

NPPF

Paragraph 103 states that "The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be considered in both plan-making and decision-making."

NPSNN

Paragraph 5.18 states that the range of non-planning policies included in the Government's overarching national carbon reduction strategy will ensure that any carbon increases from road development do not compromise its

overall carbon reduction commitments. “Therefore, any increase in carbon emissions is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the proposed scheme are so significant that it would have a material impact on the ability of the Government to meet its carbon reduction targets”.

Road Investment Strategy (RIS) Policy Paper

The Road Investment Strategy for the 2015/16 – 2019/20 Road Period includes an aspiration for major reductions in carbon emissions across the network.

Highways England Licence

As an arm’s length company Highways England operates under a licence granted by the Secretary of State in April 2015. Section 5.23 (e & h) states it must seek to “minimise carbon emissions” and “other greenhouse gases from its operations and take opportunities to influence road users to reduce the greenhouse gas emissions from their journey choices.”

'A Green Future: Our 25 Year Plan to Improve the Environment'

The 25 Year Environment Plan sets out government action to help the natural world regain and retain good health.

The Plan refers to national commitments to reductions in greenhouse gas emissions, and the actions outlined in the Clean Growth Strategy.

Clean Growth Strategy

The Clean Growth Strategy sets out policies and proposals that aim to accelerate the pace of “clean growth”, referred to as delivering increased economic growth and decreased emissions. Key policies and proposals in the strategy include ending the sale of new conventional petrol and diesel cars and vans by 2040; support for the uptake of ultralow emission vehicles (ULEV); investment in the electric charging network; support for low emission taxis and buses; work to enable options to shift freight from road to rail; and investment of public funds in innovation in low carbon transport technology and fuels.

C.3.3 REGIONAL POLICY

Greater Manchester Low-Emission Strategy and Greater Manchester Air Quality Action Plan

Greater Manchester’s Low-Emission Strategy sets out priority areas for future investment which will contribute to a reduction of air pollution in Greater Manchester. Actions proposed include measures to stimulate the uptake of Ultra- Low-Emission Vehicles (ULEVs), measures to reduce emissions from Heavy Good Vehicles (HGVs), measures to reduce emissions from buses on key urban corridors, measures to change travel behaviour, investigation of clean air zones and measures to reduce emissions of new development. The strategy also outlines key measures to be taken in specific focus areas, which includes the M60/M62 corridor and major routes into the town centre.

Greater Manchester’s Air Quality Action Plan sets out actions to improve air quality across Greater Manchester and embed low-emission behaviours into the cultural of organisations and lifestyles by 2025. Actions across the following broad subjects are established: development management and planning regulation, freight and heavy good vehicles, buses, cycling, travel choices, cars, information and resources.

Greater Manchester Transport Strategy 2040

Greater Manchester's Transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 8 'we will work with partners to reduce, as far as possible, the emissions from transport, particularly CO₂, NO₂, particulates and noise'.

Greater Manchester Combined Authority – Springboard to a Green City Region

Following on from a 'Green Summit' held in March 2018, the Springboard report sets out Greater Manchester's plans to make it one of the leading green city regions in the UK and Europe. This contains immediate actions including measures to shift transport to zero emissions.

C.4 Landscape and Townscape

C.4.1 NATIONAL POLICY

NPPF

The NPPF Paragraph 170 states that 'the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils. Paragraph 172 states that Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. Paragraph 173 states 'Within areas defined as Heritage Coast, planning policies and decisions should be consistent with the special character of the area and the importance of its conservation'. The NPPF states that 'Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. The use of good landscape design practice would ensure that this policy is followed to create a landscape design in keeping within the surroundings, enhancing the natural environment where possible.

NPSNN

Paragraph 5.144 states where the development is subject to EIA the applicant should undertake an assessment of any likely significant landscape and visual impacts in the EIA and describe these in the ES. Paragraphs 5.146-148 require that the applicants' assessment to consider any relevant national and local development policy; significant effects during construction and operation and; visibility and conspicuousness, would need to comply with the respective duties in section 11A of the National Parks and Access to Countryside Act 1949 and section 85 of the Countryside and Rights of Way Act 2000. Paragraphs 5.148 and 5.150 – 5.155 repeats the statements set out in the NPPF with regards to development within, or adjacent to, a National Park. Paragraph 5.154 specifically applies these

considerations to areas outside the Park boundary, in that the duty to have regard to the purposes of nationally designated areas also applies when considering applications outside these areas. The NPSNN in paragraph 5.152 and 5.154 states a presumption against any significant road widening or the building of new roads in a National Park, or development outside the National Park which might affect it.

RIS

Although landscape as a topic does not have any direct KPI's or targets, the plan states that the proposed Environmental fund will be used to maintain an attractive landscape, and work to halt the loss of biodiversity.

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) "Minimise the

environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment.”

'A Green Future: Our 25 Year Plan to Improve the Environment'

The sixth of the 10 25-year goals of the plan are to achieve 'enhanced beauty, heritage and engagement with the natural environment'. The plan states a desire to ensure that England's most beautiful landscapes are not only conserved but enhanced. The plan announces a review of National Parks and AONBs, to consider coverage of these designated areas, whether there is scope for expansion and opportunities to enhance the environment within these designations. The plan also states that action will be taken to identify 'opportunities for environmental enhancement in all of England's 159 National Character Areas and monitoring indicators of our landscape's character and quality to improve landscapes for people, places and nature'.

C.4.2 REGIONAL POLICY

Greater Manchester Transport Strategy 2040

Greater Manchester's Transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 9 'we will work with partners, including the Canals and Rivers Trust, to enhance green and blue infrastructure to provide a safe and attractive environment for walking and cycling'. Furthermore, Policy 10 states that 'we will aim to minimise the impact of transport on the built environment, (including townscape, the historic environment, cultural heritage, landscape, habitats and biodiversity, geodiversity, water quality, pollution, flood risk and use of resources) and will seek to deliver environmental enhancements and biodiversity net gain where possible.

C.5 Cultural Heritage

C.5.1 NATIONAL POLICY

NPPF

Paragraph 189 requires an applicant to describe the significance of any heritage assets affected, including any contribution made to their setting. Paragraph 190 requires the identification and assessment of the significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of heritage asset) taking account of the available evidence and any necessary expertise. In assessing the impact of a proposed development on the significance of a designated heritage asset, paragraph 193 requires significant weight to be given to the conservation of the asset and (paragraph 196) notes that where development will lead to less than substantial harm to the significance of a designated heritage asset the harm should be weighed against the public benefits of the proposal. Furthermore, paragraph 172 requires that significant weight is given to the conservation of cultural heritage in National Parks.

NPSNN

Paragraph 5.126 states that where the development is subject to EIA the applicant should undertake an assessment of any likely significant heritage impacts of the proposed project as part of the EIA and describe these in the ES. The applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. Paragraph 5.131 states that in decision making when considering the impact of a proposed development on the significance of a designated heritage assets, great weight should be given to the asset's conservation, and the more important the asset the greater the weight should be. In paragraph 5.133 it is stated that where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, consent should be

refused unless it can be demonstrated that the substantial harm or loss of significance is necessary to deliver substantial public benefits that outweigh that loss or harm.

RIS

There are no relevant policies, KPI's or PIs within the RIS for this topic area. However, there is a commitment to 'invest over £100 million to enhance the network's landscape, address areas where there are negative impacts on sites of historic or cultural heritage, and improve the impact on local biodiversity,' within RIS period 1.

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) "Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment." The Licence in 5.23 (a) goes on to state that it must "Ensure that protecting and enhancing the environment is embedded into its business decision-making processes" and in 5.23 (b) to ensure "best practicable environmental outcomes across its activities."

'A Green Future: Our 25 Year Plan to Improve the Environment'

The sixth of the 10 25-year goals of the plan are to achieve 'enhanced beauty, heritage and engagement with the natural environment'. The plan states that this will be done by 'safeguarding and enhancing the beauty of our natural scenery and improving its environmental value while being sensitive to considerations of its heritage'.

C.5.2 REGIONAL POLICY

Greater Manchester Transport Strategy 2040

Greater Manchester's Transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 9 'we will work with partners, including the Canals and Rivers Trust, to enhance green and blue infrastructure to provide a safe and attractive environment for walking and cycling'. Furthermore, Policy 10 states that 'we will aim to minimise the impact of transport on the built environment, (including townscape, the historic environment, cultural heritage, landscape, habitats and biodiversity, geodiversity, water quality, pollution, flood risk and use of resources) and will seek to deliver environmental enhancements and biodiversity net gain where possible.

C.6 Biodiversity

1.6.1 NATIONAL POLICY

NPPF

At a national level, planning policy is driven by the NPPF (2018) which states that: 'Planning policies and decisions should contribute to and enhance the natural and local environment by... (Paragraph 170 requires) 'minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...'. Paragraph 172 requires great weight is given to the conservation of wildlife in National Parks.

Paragraph 173c states that 'development resulting in the loss or deterioration of irreplaceable habitat (such as ancient woodland) should be refused, unless there are wholly exceptional reasons and a suitable mitigation strategy exists'.

NPSNN

Paragraph 5.22 requires that where the project is subject to EIA the applicant should ensure that the ES clearly sets out any likely significant effects on sites designated as ecological or geological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems. Paragraph 5.24 requires the applicant to show how the project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests. Paragraph 5.25 states that as a general principle in decision making, development should avoid harm to biodiversity and geological conservation interests, while Paragraph 5.26 requires that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment. Paragraph 5.36 states that applicants should include appropriate mitigation measures as an integral part of their project.

RIS

Highways England has an aspiration that the operation, maintenance, and enhancement of the Strategic Road Network should deliver no net loss of biodiversity. In the long term, it should deliver a net gain across its broader range of works. Highways England published their Highways Biodiversity plan in June 2015. This contains a review of Highways England's historical biodiversity performance and goes on to set five outcomes for biodiversity to be achieved by Highways England over the Road Investment Strategy RIS1 period, i.e. 2015 - 2020. Central to the Highways Biodiversity Plan is the requirement for Highways England to achieve no net loss of biodiversity by 2020 (i.e. within RIS1) and a net gain in biodiversity by 2040, in line with objectives set within the RIS.

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) "Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment."

'A Green Future: Our 25 Year Plan to Improve the Environment'

The third of the 10 25-year goals of the plan are to achieve 'thriving plants and wildlife'. On land and freshwaters, the plan states that this goal will be achieved by restoring 75% of protected sites to favourable condition, creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network (including a focus on priority habitats as part of a wider set of land management changes), taking action to recover threatened, iconic or economically important species and increase woodland in England in line with an aspiration of 12% cover by 2060.

The plan states that it will seek to embed a 'net environmental gain' principle for development to deliver environmental improvements locally and nationally. While current policy is that the planning should provide biodiversity net gains where possible, it will be explored whether this requirement can be strengthened to other areas and the government will consult on making this mandatory.

The plan's actions to assist the recovery of nature includes the development of a 'Nature Recovery Network' that will deliver on the recommendations in 'Making Space of Nature' (2010) for landscape scale conservation.

The plan's aspirations for woodland planting includes increased tree planting while also supporting increased protection of existing trees and forests. The plan also supports for the planting of a new 'Northern Forest' using the M62 as its spine.

Environment Act 1995

There is a responsibility under Section 62 of the Environment Act 1995 to have due regard for the purposes of the National Parks, which includes 'to conserve and enhance the natural beauty, wildlife and cultural heritage of the National Parks'. Where there is a potential conflict with Highways England's proposals, greater weight should be attached to the purpose of conserving and enhancing the natural beauty, wildlife and cultural heritage of the area comprised in the National Park.

1.6.2 REGIONAL POLICY

Greater Manchester Transport Strategy 2040

Greater Manchester's transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 9 'we will work with partners, including the Canals and Rivers Trust, to enhance green and blue infrastructure to provide a safe and attractive environment for walking and cycling'. Furthermore, Policy 10 states that 'we will aim to minimise the impact of transport on the built environment, (including townscape, the historic environment, cultural heritage, landscape, habitats and biodiversity, geodiversity, water quality, pollution, flood risk and use of resources) and will seek to deliver environmental enhancements and biodiversity net gain where possible.

C.7 Water Environment

C.7.1 NATIONAL POLICY

NPPF

Section 14 – 'Meeting the challenge of climate change, flooding and coastal change' states that: 'developments should not increase flood risk elsewhere and that developments should be safe for their users for the whole of the development's lifetime.' Paragraph 180 of Section 15 of the NPPF: 'Conserving and Enhancing the Natural Environment' states: 'Planning policies and decisions should also ensure that new development is appropriate for its location considering the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.'

NPSNN

Paragraph 5.96 advises that applicants for projects which may be affected by, or may add to, flood risk to seek sufficiently early pre-application discussions with the Environment Agency, and, where relevant, other flood risk management bodies such as lead local flood authorities, Internal Drainage Boards, sewerage undertakers, highways authorities and reservoir owners and operators. Paragraph 5.97 states that surface water flood issues need to be understood and then account of these issues can be taken. The NPS states that in decision-making, the SoS will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the Water Framework Directive.

RIS

There are no relevant policies, KPI's or PIs within the RIS for this topic area.

Highways England Licence

As an arm's length company Highways England operates under a licence granted by the Secretary of State in April 2015. The licence sets out various requirements including environmental objectives: 4.2 (g) "Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment."

'A Green Future: Our 25 Year Plan to Improve the Environment'

The third of the 10 25-year goals of the plan are to achieve 'clean and plentiful water'. The plan states that this will be achieved by several actions, including reaching or exceeding objectives for rivers, lakes, coastal and ground waters that are specially protected'. The plan also looks to put in place more sustainable drainage systems, which it will do through amending planning practice guidance to clarify construction and ongoing maintenance arrangements for SuDS in new developments and considering changes to the NPPF and Building Regulations in the longer term to encourage SuDS.

C.7.2 REGIONAL POLICY

Greater Manchester Transport Strategy 2040

Greater Manchester's transport Strategy sets out ambitions for the transport system in Greater Manchester and establishes policies and actions to achieve this. This includes Policy 9 'we will work with partners, including the Canals and Rivers Trust, to enhance green and blue infrastructure to provide a safe and attractive environment for walking and cycling'. Furthermore, Policy 10 states that 'we will aim to minimise the impact of transport on the built environment, (including townscape, the historic environment, cultural heritage, landscape, habitats and biodiversity, geodiversity, water quality, pollution, flood risk and use of resources) and will seek to deliver environmental enhancements and biodiversity net gain where possible.

Appendix D. ISA Assessment Aid Questions

The following is an extract of Table 8-1 from the Transport for the North (TfN) Strategic Transport Plan (STP) Integrated Sustainability Appraisal (ISA) (Atkins, 2018).

Table 18: ISA Framework Objectives and Assessment Aid Questions (Atkins, 2018)

Objective No.	Objective	Decision making questions
1	Reduce greenhouse gas emissions from transport overall, with emphasis on road transport	<p>Will the Strategic Transport Plan:</p> <ul style="list-style-type: none"> • Encourage a greater proportion of passenger and freight movement by lower carbon modes? • Encourage greater carbon efficiency in the movement of goods and people? • Encourage use of innovative new low carbon transport technologies? • Encourage use of the transport estate for low carbon energy generation? • Encourage the protection and enhancement of carbon sinks in the transport estate? Will it support the creation of carbon sinks?
2	Protect and enhance biodiversity, geodiversity and the green infrastructure network	<p>Will the Strategic Transport Plan:</p> <ul style="list-style-type: none"> • Lead to the direct physical loss of wildlife and habitats? • Prevent damage to / destruction of / disturbance of sites designated for nature conservation and or geodiversity? • Affect greenfield and/or brownfield land which has significant biodiversity or geological interest of recognised local importance? • Support the protection and enhancement of green infrastructure and avoid severance of habitats links / promote or provide wildlife corridors and cohesive habitat networks? • Support new habitat creation and enhancement? • Promote good design to secure biodiversity / green infrastructure benefits?
3	Conserve and enhance the international sites (HRA specific objective)	<p>Will the Strategic Transport Plan:</p> <ul style="list-style-type: none"> • Affect international sites designated for nature conservation identified as part of the HRA screening process (including positive and negative effects)?
4	Protect and enhance air quality	<p>Will the Strategic Transport Plan:</p> <ul style="list-style-type: none"> • Support the minimisation of emissions of air pollutants and enhancement of air quality?

Objective No.	Objective	Decision making questions
6	Protect and enhance the inland and coastal water environment	Will the Strategic Transport Plan... <ul style="list-style-type: none"> • Support the protection of the quality of inland and coastal surface water and groundwater resources? • Promote the minimisation of the use of impermeable hard surfacing and promote the use of SuDS? • Provide opportunities to improve Green / blue infrastructure? • Provide opportunities to improve water body status?
8	Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	Will the Strategic Transport Plan: <ul style="list-style-type: none"> • Support the conservation, protection and enhancement of the region's cultural and designated / non-designated historic assets (e.g. locally important buildings, archaeological remains, World Heritage Sites, Scheduled Monuments, Listed Buildings and structures, registered Parks and Gardens, Registered Battlefields and Conservation Areas), their integrity and their settings? • Improve access to historic / culturally important sites by sustainable transport modes? • Appropriately manage elements of the transport infrastructure which are designated heritage assets? • Aid the appropriate management of any relevant Heritage at Risk to help remove it from the HAR register?
9	Protect and enhance the character and quality of landscapes and townscapes	Will the Strategic Transport Plan: <ul style="list-style-type: none"> • Encourage design, construction, repair and maintenance of transport infrastructure (and associated green / blue infrastructure) that respects and enhances the landscape character and townscapes of the north of England? • Promote the conservation, protection and enhancement of the natural environmental assets (e.g. National Parks, AONBs, parks and green spaces, common land, woodland/ forests, etc.) of the north of England? • Consider avoidance of sensitive areas and respect of the integrity and setting of landscapes / townscapes? • Support the protection of 'tranquil' areas (e.g. areas free from visual intrusion, noise, light pollution etc)? • Promote the protection and enhancement of locally important buildings and townscapes, maintaining and strengthening local distinctiveness and a sense of place?

Objective No.	Objective	Decision making questions
11	Enhance lower carbon, affordable transport choice	<p>Will the Strategic Transport Plan:</p> <ul style="list-style-type: none"> • Support the minimisation of dependence upon the private car? • Promote a shift to rail travel into and between city centres? • Promote the transportation of freight by waterways and rail? • Enhance public transport availability, convenience, accessibility and affordability? • Promote a wider choice of passenger travel through quality integrated facilities and services, walking and cycling improvements, demand management, network management, travel planning and intelligent transport systems? • Consider the specific transport needs of rural communities? • Contribute to the creation of infrastructure to encourage people to switch to low emission vehicles?

Appendix E. Strategic Outline Case (SPOC) – Environmental Impact Worksheets

- Environmental Capital
- Planning Policy
- ISA objectives

Environmental Capital

SOP Intervention	Noise		Air Quality	Greenhouse Gases	Landscape			Townscape	Historic Environment					Biodiversity								Water Environment					
	Noise Important Areas	Residential Properties?	AQMAs	Comments	AONB	Country Park	National Character Area	Likely to fall within an urban area? (check OS basemaps)	World Heritage Site	Registered Battlefield	Scheduled Monuments	Registered Parks and Gardens	Listed Buildings	SAC	SPA	Ramsar	SSSI	National Nature Reserve	RSPB Reserve	Ancient Woodland	Local Nature Reserve	Important Bird Area	Priority Habitats	Flood Zones	Main Rivers	SPZs	
A1 - Bridge connecting Weston Rd and Gresty Rd	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	>1km Crewe Hall Grade II	Potential direct impacts and setting impacts	West Midlands Mosses >2km	N	Midland Mere and Mosses - Phase 1 >2km	Sandbach Flashes, Oakhanger Moss, Wyburnbury Moss and Black Firs & Cranberry Bog >2km	N	N	N	Cranberry Moss >2km	N	N	N	N	N	N
A2 - Crewe North Bypass	Potential improvements to nearby NIAs	Potential to reduce impacts to residential properties	Potential to reduce impacts of AQMAs in Crewe	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Sandbach Flashes	N	N	N	N	N	Lowland Fens and Deciduous Woodland	FZ2 and FZ3	Y	N	
A3 - road connecting Crewe North bypass and Middlewich Southern Bypass	Potential improvements to nearby NIAs	Y	Potential to reduce impacts of AQMAs in Crewe and Middlewich	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Sandbach Flashes	N	N	N	N	N	Deciduous Woodland	FZ3	Y	N	
B2 - Warrington Improvements	Y	Y	Y	Embedded Carbon	N	N	Mersey Valley	Y	N	Y	Potential direct impacts and setting impacts	N	Potential direct impacts and setting impacts	Manchester Mosses Rixton Clay Pits	N	N	Woolston Eyes, Rixton Clay Pits, Risley Moss, Holcroft Moss, Highfield Moss	N	N	N	Paddington Meadows, Risley Moss, Rixton Clay Pits	N	Deciduous Woodland, Lowland Fens, Lowland Raised Bog, Reedbeds, Coastal Floodplain and grazing marsh	FZ2 and FZ3	Y	SPZ3	
B4 - Warrington East highway improvements	Y	Y	Y	Embedded Carbon	N	N	Mersey Valley	Y	N	Y	Potential direct impacts and setting impacts	N	Potential direct impacts and setting impacts	Manchester Mosses Rixton Clay Pits	N	N	Woolston Eyes, Rixton Clay Pits, Risley Moss, Holcroft Moss, Highfield Moss	N	N	N	Paddington Meadows, Risley Moss, Rixton Clay Pits	N	Deciduous Woodland, Lowland Fens, Lowland Raised Bog, Reedbeds, Coastal Floodplain and grazing marsh	FZ2 and FZ3	Y	SPZ3	
B6 - Warrington North Pinch Points and Omega Access Strategy	Y	Y	Y	Embedded Carbon	N	N	Mersey Valley	Y	N	Y	Potential direct impacts and setting impacts	N	Potential direct impacts and setting impacts	Manchester Mosses Rixton Clay Pits	N	N	Woolston Eyes, Rixton Clay Pits, Risley Moss, Holcroft Moss, Highfield Moss	N	N	N	Paddington Meadows, Risley Moss, Rixton Clay Pits	N	Deciduous Woodland, Lowland Fens, Lowland Raised Bog, Reedbeds, Coastal Floodplain and grazing marsh	FZ2 and FZ3	Y	SPZ3	
C1 - Crewe to Sandbach Improvements (A534)	Potential improvements to nearby NIAs	N	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Sandbach Flashes >2km	N	N	N	N	N	Deciduous woodland	FZ3	Y	N	
C10 - Expressway upgrade of A34 (Congleton to Wilmslow) including widening of Alderley Edge bypass	NIAs on route	Y	Y	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Alderley Edge >1km	N	N	Potential Impacts	N	N	Deciduous woodland, wood pasture and parkland.	FZ3	Y	N	
C14 - Deliver Segregated HGV Bypass Lanes between M6 J16-19	NIAs on route	N	Y	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	Potential direct impacts and setting impacts	Tabley House Grade II, Tatton Park Grade II* 1.8km	Potential setting impacts	N	N	Midland Meres and Mosses Phase 2 app. 130m	Oakhanger Moss app. 130m, Tabley Mere app. 850m	N	N	Potential Impacts	Cranberry Moss app. 900m	N	Deciduous woodland, Lowland Fens, wood pasture and parkland.	FZ3	Y	N	
C2 - new M6 Junction, link to A534 and A534	NIAs on route	Y	Potential to reduce impacts to Congleton AQMA No.6	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	Deciduous woodland	FZ3	Y	N		
C5 - New and improved Link between Congleton Bypass & new M6 Junction 17 (C2)	NIAs on route	Y	Y	Embedded Carbon	N	Asbury Mere	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	Deciduous woodland	FZ3	Y	N		
C6 - Holmes Chapel Bypass	NIAs on route	Y	N	Embedded Carbon	N	Asbury Mere, Brereton Heath	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	Midland Meres and Mosses - Phase 1	Bagmere, Holly Banks, River Dane	N	N	Potential Impacts	Brereton Heath	N	Deciduous woodland	N	Y	N	
C7 - Improvements on A536 between Macclesfield and Congleton	NIAs on route	Y	Y	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	Potential direct impacts and setting impacts (app. 300m)	Potential direct impacts and setting impacts	Gawsworth (old) Hall Grade II*	N	N	Madams Wood app. 700m, Danes Moss app. 600m	N	N	Potential Impacts	N	N	Deciduous Woodland- Old Brickbank Wood, Dighills Farm, traditional Orchard - Gawsworth area.	N	N	N	
C8 - Targeted junction improvements on the A523 between Macclesfield & Poynton	NIAs on route	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	Riverside Park Macclesfield >1km	N	Deciduous Woodland	FZ3	River Dean	SPZ3	
C9 - Expressway upgrade of A34 (Stoke to Congleton) including new form A534 to A34 and bypass of Scholar Green	NIAs on route	Y	Y	Embedded Carbon	N	Asbury Mere app. 150m	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	Rode Hall Grade II app. 600m	N	N	N	N	N	Potential Impacts	Bathpool Park app. 100m	N	Deciduous woodland, woodpasture and parkland, lowland fens	FZ3	Y	SPZ3	
D1 - Measure to extend B5210 to the A56 as either a low or high level collector / distributor to separate local and strategic movements across Thelwall Viaduct.	Potential improvements to nearby NIAs	Y	Potential to reduce impact on Warrington AQMA No.1	Embedded Carbon	N	N	Mersey Valley	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Woolston Eyes	N	N	N	N	N	Deciduous woodland, Lowland Fens and Coastal and Floodplain grazing marsh	FZ3	Y	SPZ3	
D2 - Widening of M6 to 5 lanes between J21 and J21a	NIAs on route	Y	Y	Embedded Carbon	N	N	Mersey Valley	Y	N	N	N	N	Potential direct impacts and setting impacts	Rixton Clay Pits >2km, Manchester Mosses >1.5km	N	N	Woolston Eyes app. 500m, Rixton Clay Pits >2km, Risley Moss >1.5km	N	N	N	Rixton Clay Pits >2km, Risley Moss >1.5km	N	Deciduous woodland	FZ3	Y	SPZ3	
D4 - All-movements junction at M6 J.25	NIAs on route	Y	Y	Embedded Carbon	N	N	Lancashire Coal Measures	N	N	N	N	N	N	N	N	N	Bryn Marsh and Ince Moss >2km	N	N	N	N	Three Sisters >1.5km, The Wigan Flashes >1.5km	N	Deciduous woodland	N	N	N
D5 - M6 Segregated HGV Bypass Lane (South of J20A to North of J22)	NIAs on route	Y	Y	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain, Mersey Valley	Y	N	Y (app. 650m)	Potential setting impacts	N	Potential setting impacts	Manchester Mosses >1.7km	N	N	Woolston Eyes, Risley Moss >1.8km	N	N	N	Paddington Meadows >2km, Rixton Clay Pits >2km, Risley Moss app.1.8km	N	Deciduous woodland, Lowland Fens and Coastal and Floodplain grazing marsh	FZ3	Y	SPZ3	
E3 - A500/A50 Free flow junction	N	Y	Y	Embedded Carbon	N	N	Potteries and Churnet Valley	Y	N	N	N	N	Potential setting impacts	N	N	N	N	N	N	N	Smith's Pool app. 950m, Brigett's Pool >1.5km, Hartshall Park >2km	N	Deciduous woodland	FZ2	Y	N	

E4 - Dual Carriageway with grade-separation on A500 Nantwich to M6.J16	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	Approx. 500m away - Crewe Hall Grade II	Potential setting impacts	West Midlands Mosses >1.5km	N	Midland Mere and Mosses - Phase 1 >1.5km	Wyburnbury Moss >1.5km	Wyburnbury Moss >1.5km	N	Potential Impacts	N	Deciduous woodland	FZ3	Y	N	
E5 - Dual Carriageway with grade-separation on A500 M6.J16 to Stoke	N	Y	Y	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Metallic Tileries Park House app. 1km	N	N	Potential Impacts	N	Bathpool Park app. 350m, Bradwell woods app. 250m, Westport Lake app. 150m	FZ3	Y	SP23	
F2 - A51 Nantwich Dual Carriageway	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	Y	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	River Dee and Bala Lake	N	N	River Dee (England)	N	N	N	N	Deciduous woodland, Coastal Floodplain and Grazing Marsh	FZ3	Y	SP23	
F3 - Nantwich Southern Bypass	N	Potential to reduce impacts to residential properties	Potential to reduce impacts on Nantwich AQMA	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	Y	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	West Midlands Mosses	N	Midland Mere and Mosses - Phase 1	Wyburnbury Moss Hatherton Flush Sound Heath	Wyburnbury Moss	N	Potential Impacts	N	Deciduous woodland, Lowland Fens, Woodpasture and Parkland	FZ3	Y	N	
G1 - Online upgrade of A534 west of Nantwich between the A51 & A49	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	Y	Potential direct impacts and setting impacts (app. 400m)	Potential direct impacts and setting impacts	N	N	N	N	N	N	Potential Impacts	N	Deciduous woodland	FZ3	Y	N	
G2 - Localised junction improvements between A49 and Wrexham on the A534	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	River Dee and Bala Lake	N	N	River Dee (England) Dee Cliffs Farnon Afon Dyfrdwy (River Dee) Bickerton Hill app. 300m Raw Head app. 350m	N	N	Potential Impacts	N	Deciduous Woodland	FZ3	Y	SP21, SP22 and SP23	
I10 - Implementation of Smart Motorway M56 J.11-14	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N (100m)	N	N	N	N	Flood Brook Clough app. 130m	N	N	Potential Impacts	Murdishaw Wood and Valley	Deciduous Woodland, Coastal and Floodplain Grazing Marsh	FZ2 and FZ3	Y	N	
I15 - Widening of A483 between Jn. 4-6	Y	Noise Priority Area on route	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	N	Berwyn a Mynyddoedd De Clwyd/ Berwyn and South Clwyd Mountains >4km	N	N	Gatewen Marsh app. 50m	N	N	N	Alyn Waters app. 1.7km	Glastir Woodland creation app. 250m	N	Y - River Gwentro	N	
I16 - New road from A494 to A55	Y	Potential to reduce impacts on existing NIAs	Potential to reduce impacts on Chester City AQMA	Embedded Carbon	N	N	Deeside and Wrexham	Y	N	N	N	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	River Dee and Bala Lake/ Afon Dyfrdwy a Ulyn Tegid (Wales)	The Dee Estuary	The Dee Estuary	Afon Dyfrdwy (River Dee) River Dee (England)	N	>2km	N	N	App. 2km	Deciduous Woodland	N	Y	SP23
I2 - A550 route enhancements	N	Y	N	Embedded Carbon	N	N	Mersey Valley, Wirral	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	The Dee Estuary >3km	Inner Marsh Farm >3km Hallwood Farm Marl Pit app. 1km	N	>2km	Potential Impacts	Rivacre Valley app. 780m Burton Mill Wood >3km	App. 2km	Deciduous Woodland	FZ3	Y	N
I4 - Delivery of M56 J.13 and HGV Link Road	N	N	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	Stanney Wood app. 800m	N	N	N	
I6 - Additional lane on M56 J.15-16	N	N	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	Stanney Wood app. 800m	N	N	N	
I8 - A494 upgrade from M56/M53 across River Dee to A55	N	Y	N	Embedded Carbon	N	N	Deeside and Wrexham	Y	N	N	N	N	Potential direct impacts and setting impacts	River Dee and Bala Lake/ Afon Dyfrdwy a Ulyn Tegid (Wales) Deeside and Buckley Newt Sites >1km	N	N	Afon Dyfrdwy (River Dee) Connah's Quay Ponds and Woodland app. 1km Buckley Claypits and Commons app. 450m	N	N	N	N	N	N	FZ2 and FZ3	Y	N
K2 - Middlewich Southern Bypass	Y	Potential improvements to nearby NIAs	Potential to reduce impacts to residential properties	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Sandbach Flashes	N	N	N	N	Deciduous woodland	FZ3	Y	N	
K3 - Winsford Southern Bypass	Y	Y	N	Embedded Carbon	N	Little Budworth	Shropshire, Cheshire and Staffordshire Plain	N	N	N	N	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	N	N	N	Wimboldsley Wood Wattenhall and Darnhall Wood, Little Budworth common	N	N	Potential Impacts	N	Deciduous woodland	FZ3	Y	N	
K5 - Junction improvements on A556 between M6 J.19 and Chester	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Pettypool Brook Valley >1.8km	N	N	N	N	Marshall's Arm Hartford app. 900m	N	N	N	
K8 - Junction improvements on the A54 between Kelsall and the A51	N	Y	N	Embedded Carbon	N	N	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	N	FZ3	Y	SP23	
L3 - Extension of Knowsley Expressway (A5300) to the south of the A562	N	Y	Y	Embedded Carbon	N	N	Merseyside Conurbation	Y	N	N	N	Potential direct impacts and setting impacts	Potential direct impacts and setting impacts	N	Mersey Estuary	Mersey Estuary	Mersey Estuary	N	>7km	Potential Impacts	Hale Woodland Millwood & Alder Wood Pickering Pasture	>2km	Deciduous woodland Coastal Saltmarsh Coastal Floodplain and Grazing marsh	FZ3	Y	SP23
N3 - A580 upgrade at M6 J23 and westwards to the A579	N	Y	Y	Embedded Carbon	N	Pennington Flash (app. 2km)	Lancashire Coal Measures	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	Highfield Moss app. 1.2km Abram Flashes >2km	N	N	N	Pennington Flash app.1km	N	Deciduous Woodland	FZ2	Y	SP21, SP22 and SP23
N7 - Smart Motorway M62 J5-10	N	Y	Y	Embedded Carbon	N	N	Merseyside Conurbation, Lancashire Coal Measures, Mersey Valley	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	Potential Impacts	N	Deciduous Woodland	FZ2 and FZ3	Y	SP23, SP22	

O2 - A5036 Princess Way (Access to Port of Liverpool) full Grade separation of Junction	Y	Y	N	Embedded Carbon	N	Croxth Hall (app. 500m)	Merseyside Conurbation	Y	N	N	N	Ince Blundell Park Grade II* (app. 500m)	Potential direct impacts and setting impacts	N	N	N	N	N	N	Croxth app. 500m Acornfield Plantation >2km	N	Deciduous Woodland	N	Y	SP21, SP22 and SP23		
O3 - New link between M58 and M61 J.5	Y	Y	Y	Embedded Carbon	N	N	Lancashire Coal Measures	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	Bryn Marsh and Ince Moss	N	Deciduous Woodland, Woodpasture and parkland BAP priority habitat, Lowland Fens, Purple Moor Grass and Rush Pasture	FZ3	Y	N		
P1 - Highway link connecting M62 - Carrington - M60	Y	Y	Y	Embedded Carbon	N	N	Manchester Conurbation, Mersey Valley	Y	N	N	N	N	Potential direct impacts and setting impacts	Rixton Clay Pits	N	N	N	N	N	Holcroft Moss Risley Moss Rixton Clay Pits Brookheys Covert	N	Deciduous Woodland Coastal and Floodplain grazing marsh Lowland Fens	FZ2 and FZ3	Y	N		
P3 - M62 to A57 junction and link	Y	Y	Y	Embedded Carbon	N	N	Mersey Valley	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	N	N	Deciduous Woodland	FZ2	N	N		
Skelmersdale rail link	N	Y	N	Embedded Carbon	N	Beacon Park >1km	Lancashire & Amounderness Plain	Y	N	N	N	N	Potential direct impacts and setting impacts	N	N	N	N	N	N	Ravenhead Brickworks >1km	N	Siding Lane Woodland >2km Greenslate Water Meadows > 2.5km	FZ2 and FZ3	Y	N		
Crewe - Stoke - Derby (journey time improvements)	NIAs on route	N	Y	N	N	Park Hall app. 1.2km	Cheshire and Staffordshire Plain Potteries and Churnet Valley Needwood and South Derbyshire Claylands Trent Valley Washlands	Y	Derwent Valley Mills app. 1km	N	Potential settings impacts (app. 250m)	N	Potential setting impacts	N	N	N	Midland Meres & Mosses Phase 2 app. 750m	Oakhanger Moss app. 750m Hulme Quarry app. 1.2km Old River Dove and Marston on Dove app. 300m	Hulme Quarry app. 1.2km Wybunbury Moss app. 2.5km	N	The Sanctuary app. 1.2km Sunnydale Park app. 950m Elm Wood app. 1.1km Sinfin Moor app. 790m Coyney Woods app. 280m Smith's Pool (adjacent) Berryhill Fields app. 1.8km Hartshill Park app. 350m Westport Lake (adjacent) Bradwell Woods app. 600m Bathpool Park (within) Cranberry Moss app. 380m	N	Deciduous Woodland Lowland Fens Coastal and Floodplain Grazing Marsh Good quality semi-improved grassland (Non Priority)	FZ2 and FZ3	Y	SP21, SP22 and SP23	
Extension of North Staffordshire services to Nottingham and Manchester Airport	NIAs on route	N	Y	Increased carbon emissions, due to more services.	N	Bereton Heath >3km Quarry Bank Mill and Styal Estate app. 130m	Shropshire, Cheshire and Staffordshire Plain	Y	N	N	Potential settings impacts (app. 440m)	Cheadle Royal Hospital Grade II >1.5km Peover Hall Grade II >1.5km Queen's Park, Crewe Grade II* >2km Crewe Hall Grade II >1km	Potential setting impacts	N	N	N	Midland Meres & Mosses - Phase 1 >3km	Cottrell Clough >2km Lindow Common app. 1.4km Alderley Edge app. 530m River Dane app. 1.3km Bagmere >3km Sandbach Flashes (adjacent)	N	Lindow Common app. 1.4km Bereton Hall >3km	N	Deciduous woodland Lowland Meadows Lowland Fens	FZ2 and FZ3	Y	N		
Manchester to Skelmersdale (via Wigan) service frequency enhancement	Road NIAs	Y	Y	Increased carbon emissions, due to more services.	N	Beacon Park >1km Haigh >1km Blackleach app. 1km Clifton >1km Prestwich app. 1km	Manchester Conurbation Lancashire Coal Measures Lancashire and Amounderness Plain	Y	N	N	Potential settings impacts (app. 360m)	Mesnes Park Grade II app. 550m Hulton Park Grade II app. 280m Bulle Hill Park Grade II app. 800m Weaste Cemetery Grade II >1.5km	Potential direct impacts and setting impacts	N	N	N	N	Ravenhead Brickworks app. 630m Bryn Marsh & Ince Moss >1.5km	N	The Wigan Flashed app. 1km Kirkless app. 870m Low Hall Park >1km Borsdane Wood (adjacent) Cunningham Clough Brook app. 80m Eatock Lodge app. 400m Hall Lee Bank Park (adjacent) Pretoria Pit app. 250m Blackleach Country Park app. 1km Worsley Woods app. 980m Clifton Country Park >1.5km Philip's Park & Mere Clough >1.8km The Cliff/ Kersal Dale >1.3km Kersal Moor >1.7km Three Sisters >2km	N	Deciduous Woodland Lowland Fens Good quality semi-improved grassland (Non Priority)	FZ2 and FZ3	Y	N		
New stations at Stoke park and ride	Road NIAs	Y	Y	Embedded Carbon	N	N	Potteries and Churnet Valley	Y	N	N	Potential settings impacts (app. 950m away)	>1km Hanley Park Grade II*	Potential setting impacts	N	N	N	N	N	N	N	N	Hartshill Park app. 700m	N	N	FZ2 and FZ3	Y	N

Red - likely to have significant adverse environmental effects
 Amber - potential to have significant adverse environmental effects
 Green - unlikely to have any significant adverse environmental effects.

Planning Policy

Compliance with different levels of planning policy			
Environmental topic	International Policy	National Policy	Regional policy
Noise	N/A	<p>The SOP interventions risk conflicting with NPPF and NPSE through the proposed construction of a number of new road links. The SOP interventions also provide the opportunity to comply with policy aims to avoid significant adverse noise impacts on health and quality of life through proposed bypasses, diverting traffic from urban areas improving overall townscape.</p> <p>The proposed rail interventions have the potential to conflict with NPPF and NPSE as these pass through a number of noise important areas.</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>	<p>The SOP interventions risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040 with the construction of new roads. The introduction of bypasses particularly around Nantwich and Holmes Chapel will have beneficial impact on noise through a reduction in traffic.</p> <p>The rail SOP interventions have the potential to comply with Policy 10 of the Greater Manchester Transport Strategy 2040 as an increase in services on existing lines has the potential to encourage use of public transport.</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>
Air Quality	N/A	<p>The SOP road and rail interventions risk conflicting with NPPF with many of the proposed interventions passing through existing AQMAs. However the construction of these new road links has the potential to have a positive effect on the reduction of emissions in urban areas. .</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>	<p>The SOP road and rail interventions risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040 with the construction of new roads.</p> <p>TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.</p>
Greenhouse Gases	<p>Under the United Nations Framework Convention on Climate Change (UNFCCC) agreement, UK have pledged to reduce GHG emissions. The SOP interventions currently considered would increase GHG emissions, which would conflict with this policy.</p>	<p>The SOP road and rail interventions risk conflicting with NPPF, as these will lead to an increase in carbon emissions. TfN will continue to work with local authorities, Highways England and communities, looking at genuine alternative transport options and opportunities for sustainable transport solutions.</p>	<p>The SOP road and rail interventions risk conflicting policy 8 of the Greater Manchester Transport Strategy 2040 and Greater Manchester 'Springboard to a Green City Region 'with the construction of new roads, will lead to an increase in carbon emissions. TfN will continue to work with local authorities, Highways England and communities, looking at genuine alternative transport options and opportunities for sustainable transport solutions. This will include measures to stimulate the update of electric vehicles, which would compile with Grater Manchester Low Emission Strategy.</p>
Landscape and Townscape	N/A	<p>The SOP includes road improvement schemes in close proximity of the Peak District National Park which has potential to change views from this designated area. Impacts risk conflicting with NPPF and NPSNN in relation to National Parks. The rail and road SOPs are not anticipated to affect any AONBs.</p> <p>The interventions also risk adverse impacts on landscape character of national character areas, conflicting with planning policy relating to the protection of valued landscapes particularly of NCA61, NCA60, NCA62 and NCLA13 in which interventions may cumulatively or in isolation degrade the characteristics of these areas.</p> <p>TfN will continue to work with local authorities, environmental stakeholders and communities to discuss and agree mitigation strategies for all potential interventions.</p>	<p>The SOP road interventions risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040 with the construction of new roads. The introduction of bypasses particularly around Nantwich and Holmes Chapel will have beneficial impact on local townscape through the reduction in traffic promoting walking and cycling.</p> <p>The construction of the proposed Skelmersdale rail link risks conflicting with the Greater Manchester Transport Strategy 2040 as the proposed route has the potential to negatively impact upon flood risk and townscape in the area.</p> <p>TfN will continue to work with local authorities, environmental stakeholders and communities to discuss and agree mitigation strategies for all potential interventions.</p>
Historic Environment	N/A	<p>The SOP interventions are not anticipated to impact upon the Liverpool Maritime Mercantile City World Heritage Site which is located within the SDC. The interventions risk affecting a number of designated heritage assets of national value. The proposed segregated HGV Bypass lanes between M6 J.16-19 falls within close proximity of Tabley House Grade II park and garden, and improvements on the A536 between Macclesfield and Congleton falls within close proximity of Gawsorth (old) Hall Grade II* park and garden. These schemes risk slight adverse impacts on the features of these heritage assets. It is anticipated that through the use of mitigation measures, the direct impacts of the SOP interventions and setting impacts will be minimised.</p> <p>TfN will continue to engage with Historic England, local authorities and communities to discuss and agree mitigation strategies for all potential interventions.</p>	<p>The SOP interventions risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040. The SOP interventions pass in close proximity to and risk impacts upon features of historic and cultural heritage.</p> <p>TfN will continue to engage with Historic England, Local Authorities and communities to discuss and agree mitigation strategies for all potential interventions.</p>
Biodiversity	N/A	<p>Several of the interventions have the potential for adverse impacts on European designated sites, SSSI, national nature reserves and RSBP reserves and will require a design which mitigates or compensates for any impacts to comply with the requirements of the Habitats Directive.</p> <p>TfN will continue to work with Natural England, local authorities, environmental stakeholders and local communities to discuss and agree the appropriate enhancement measures and actions for this.</p>	<p>The SOP interventions risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040. The interventions risk impacting upon habitats and biodiversity. TfN will continue to work with Natural England, local authorities, environmental stakeholders and local communities to discuss and agree the appropriate enhancement measures and actions for this.</p>
Water Environment	N/A	<p>SOP interventions fall within the catchment of a number of main rivers and water courses which have the potential to contribute to the pollution of surface water, including existing infrastructure and new road links. With the use of appropriate mitigation the impact on water quality will be negligible.</p> <p>The SOP includes schemes which fall within flood zones which have the potential to alter floodplains or increase flood risk. Through the use of appropriate mitigation these interventions will not adversely affect floodplains or increase flood risk to sensitive receptors.</p> <p>TfN will continue to work with the Environment Agency, local authorities and communities to agree and discuss mitigation strategies for all potential interventions.</p>	<p>The SOP interventions through the construction of new roads risk conflicting with Policy 10 of the Greater Manchester Transport Strategy 2040 through potential increases on flood risk and impacts on water quality.</p> <p>TfN will continue to work with the Environment Agency, local authorities and communities to agree and discuss mitigation strategies for all potential interventions.</p>

	Red - likely to have significant adverse environmental effects
	Amber - potential to have significant adverse environmental effects
	Green - potential to have significant adverse environmental effects

ISA Objectives

Environmental Topic	1: Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	2: Protect and enhance biodiversity, geodiversity and the green infrastructure network	3: Conserve and enhance the international sites (HRA specific objective)	4: Protect and enhance air quality	5: Increase resilience of the transport network to extreme weather events and a changing climate	6: Protect and enhance the inland and coastal water environment	7: Protect and conserve soil and remediate / avoid land contamination	8: Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings
Noise								
Air Quality				The SOP interventions include the creation of a number of new road links and bypasses which will promote the use of private cars. The interventions have the potential to negatively impact upon existing air quality management areas. The increase in frequency of services in the rail SOP interventions have the potential to negatively impact through an increase in services where air quality management areas are present.				
Greenhouse Gases	Based on road transport only, the SOP interventions include the creation of a number of new road links and bypasses which will promote the use of private cars. The rail SOP interventions may offset some of this increase. Overall the net effect of the interventions will be to increase greenhouse gas emission.							
Landscape and Townscape								
Historic Environment								The SOP interventions fall within proximity of a large number of heritage assets and is therefore anticipated to have both direct and setting impacts on heritage assets of both national and local value. Through the use of appropriate mitigation measures many of the impacts can be minimised. However the SOP would improve access to the Liverpool Maritime Mercantile City World Heritage Site.
Biodiversity		The SOP interventions fall within or in close proximity of a European, national and regional protected sites and priority habitats having the potential to affect the integrity and status of these. It is assumed that the interventions will be delivered in accordance with the Highways Biodiversity plan requirement of no net biodiversity loss. The SOP comprises of improvements to existing highway infrastructure, following the proposed works this may present opportunities to enhance the environmental performance of this infrastructure. Opportunities for the SOP interventions to include enhancements including looking at opportunities to consider strategic biodiversity priorities, Biodiversity action plans and planting of native species and developing wildflower meadows along the linear infrastructure.	The SOP interventions have the potential to affect a number of European designated wildlife sites which have the potential to impact upon the qualifying attributes and integrity of these sites. This may include visual disturbance, noise and air pollutant emissions and loss of supporting functional habitats. The need to undertake a HRA and provide appropriate mitigation or compensation will minimise and adverse impacts and provide the potential for enhancements.					
Water Environment						The SOP interventions fall within the catchment of a number of main rivers and water courses and have the potential to contribute to transport related pollution of surface water. SOP interventions provide the potential for improvement to and upgrade of existing drainage systems.		
					Insufficient scheme design information available to assess the performance of the SOP against this objective. Please refer to the ISA for assessment of the STP. However, many of the SOP interventions fall within flood zone 2 or 3 or both, at certain locations along their routes. It is anticipated that the interventions will not adversely affect floodplains or increase flood risk.		The impact of the SOP on soils and contaminated land has not been considered in the environmental appraisal. Please refer to the ISA for assessment of the STP. However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP includes interventions located within greenfield land some of which may be Best and Most Versatile. The SOP is anticipated to result in some loss of agricultural soils through encroaching transport infrastructure. There is however the potential for the SOP to lead to the remediation of contaminated land.	

+ Beneficial
 0 Neutral
 - Adverse
 ? Uncertain
 +/- Combination of beneficial and adverse

9: Protect and enhance the character and quality of landscapes and townscapes	10: Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	11: Enhance lower carbon, affordable transport choice	12: Enhance long term economic prosperity and promote economic transformation	13: Coordinate land use and strategic transport planning across the region	14: Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	15: Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	16: Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)
		Based on road transport only, SOP interventions include the creation of a number of new road links and bypasses and highway infrastructure improvements will promote the use of private cars, and therefore will not enhance the use of lower carbon transport options. The rail transport SOP interventions includes an increase in the frequency of services, and extension of services which has the potential to reduce the dependency on private cars and enhance public transport availability.					
The interventions are not located in the proximity of AONB's, the proximity of interventions to the Peak District National Park is unlikely to have an impact on the setting with the use of appropriate mitigation. The use of embedded mitigation in the design of the SOP interventions has the potential to provide landscape enhancements. Several of the SOP interventions fall within settlements have the potential to impact on the physical and social characteristics of urban environments. Where SOP interventions draw traffic from existing settlements it is anticipated that these would have a locally beneficial impact on townscapes through a reduction in traffic flows therefore improving characteristics such as appearance.							
	Insufficient scheme design information is available at this time to assess the performance of the SOP against this objective. Please refer to the IS for assessment of the STP. However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the West and Wales SDC has a medium rate of recycling relative to other SDCs, it is anticipated that meeting this objective would provide slight beneficial effects.		Economic performance of the SOP has not been considered in this environmental appraisal. Please refer to the ISA for assessment of the STP. However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessments made in Table H-6 of the ISA; the SOP is anticipated to support economic growth in line with the STP enhancing long term economic prosperity.	Coordination of land use and strategic transport planning has not been considered in this environmental appraisal. Please refer to the ISA for assessment of the STP. However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP interventions are the implementation of a new strategic approach of more effective delivery of major infrastructure. As stated in Table H-6 the size of the SDC and number of local authorities should make coordination easier.	Equality impact assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP. However, with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP will strengthen connectivity between densely populated economic centres enhancing access to a wide range of services and jobs benefitting those who may have previously had poor access.	Health impact assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP. However, the SOP interventions are anticipated to result in increases in vehicles and HGVs which may have some negative effects on communities.	Community safety assessment of the SOP has not been undertaken with this appraisal. Please refer to the ISA for assessment of the STP. However with reference to the decision-making questions in Appendix D, the proposed SOP interventions are anticipated to align with the assumptions and assessment made in Table H-6 of the ISA; the SOP interventions are anticipated to improve the perception of community safety and reduce the fear of crime.