Transport for the North Strategic Transport Plan

Integrated Sustainability Appraisal Report - Appendices

Transport for the North

January 2018

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Appendix A. Organisations Consulted and Responses Received

For a full list of organisations consulted, please see the TfN STP ISA Scoping Report.

Table A-1 Responses received to Scoping Report consultation

Respondent	Overview of comments	Response	How has this issue been addressed?
N. Corbet Operations Manager, Forth & Southern Scotland **Scottish Natural Heritage**	SNH have no comments on the proposed methodology, although we would welcome the consideration of any trans-boundary natural heritage issues if these come to light as part of the assessment process.	Noted	We will ensure that cross boundary issues are picked up and considered as options for transport interventions close to the Scottish border are identified.
Transport Scotland	There is ongoing engagement between Transport Scotland and TfN in relation to the development of the STP. Transport Scotland keen to continue working collaboratively and will comment on impacts specifically affecting or relating to cross border transport routes, if identified following scoping phase. Transport Scotland note SEPA, SNH and HES are being consulted and state these organisations would be best placed to comment on the ISA and suggest the Scottish Water may also be worth consulting.	Noted	TfN will maintain ongoing engagement with Transport Scotland.
G Heyworth Senior Policy Advisor **Sheffield City Region**	Sheffield City Region query how the assessment addresses issues of gender within the EqIA. Whilst accepting that a focus on low income households will pick up many gender issues, it will be necessary to assess gender impact in future as part of business case development and the initial work could help establish a wider context. Sheffield City Region ask that this issue is not put on a back burner and is recognised as one that will need to be addressed going forward.	Equality and gender issues will be considered within the business case development process for transport interventions.	This will be addressed through work on Transport business cases, from Strategic Outline Business Case through to Full Business Case development.
Anne Robinson **Friends of the Peak District & Campaign to Protect Rural England (South Yorkshire)**	This response to consultation was detailed and comprehensive, covering a range of issues. Issues raised related to: 1. Language of the ISA 2. Assumption that better connectivity required	TfN welcomes this comprehensive response on the early drafts of the STP documentation.	Development of the ISA and STP was undertaken in an iterative manner and considered all of the issues raised and amendments were made where these were considered appropriate in the light of the full range of considerations to be

Respondent	Overview of comments	Response	How has this issue been addressed?
	3. Emerging Strategy's failure to address carbon emissions and air pollution 4. Small scale smart / active schemes largely ignored. The response also made a number of suggestions for additional elements to be considered in the ISA and STP.		made in the development of both the ISA and STP. Specifically, the response on the particular issues raised were: 1. Language of the ISA – comments were noted, but it was considered that the language used within the ISA was appropriate and proportionate. 2. Assumption that better connectivity is required – comments were noted. Better connectivity is a key element within the range of Strategic Components within the STP and which were all fully assessed as part of the ISA. As such, a full understanding of the issues relating to Connectivity in sustainability terms has been made. 3. Emerging Strategy's failure to address carbon emissions and air pollution – comments were noted. The STP addresses the issue of Carbon emissions and Air Pollution – for example the ambition to reduce emissions from impacts from air quality and carbon from transport is included within the objective of the STP to 'promote and support the built and natural environment' and both issues were subject to specific assessment as part of the ISA,

Respondent	Overview of comments	Response	How has this issue been addressed?
			with specific ISA Objectives relating to these. 4. Small scale smart / active schemes largely ignored – comments noted. However, Integrated and Smart Travel forms a key component of the STP and was fully assessed as part of the ISA.
L Burns **North West Transport Roundtable**	A key motivating factor behind the establishment of Transport for the North (TfN), was a requirement for it to focus its attention on activities and infrastructure which had perceived economic benefits. This was emphasised by the TfN presenter at the CfBT-organised stakeholder workshop held in Manchester on November 25th, 2016. As the TfN website and documentation published to date confirm, TfN's focus is 'driving economic growth'. This emphasis distorts its approach to sustainability, which is not balanced equally - as it should be - on economic, environmental and social issues. Consequently, instead of questioning how many journeys are necessary and whether there are ways of reducing the need to travel, there is an inherent assumption in the whole TfN ethos that encouraging and enabling more trips is a good thing for the economy. This, despite government acceptance some two decades ago of two seminal reports by SACTRA, its leading transport adviser at the time, that creating new highway capacity generates extra trips ('Transport & the Generation of Traffic') and that - in a mature economy such as that which exists in the UK - there is no automatic economic benefit in providing new transport infrastructure ('Transport & the Economy').	TfN welcomes this comprehensive response on the early drafts of the STP documentation.	The draft Strategic Transport Plan sets out four core objectives, each of equal weight. These are: • Transform Economic Performance • Promote and support the built and natural environment • Improve opportunities across the north • Increase efficiency, reliability and resilience on the transport system The STP takes a balanced approach, recognising the key role transport has in supporting economic activity and through the efficient and reliable movements of passengers and freight opening up greater opportunities for people and businesses. Whilst also ensuring that environmental and sustainability impacts are a key consideration in option selection for new strategic transport infrastructure interventions; The STP also recognises the importance of promoting solutions that

Respondent	Overview of comments	Response	How has this issue been addressed?
	There is also a lack of any genuine commitment to tackle the urgent problems of greenhouse gas emissions, notably carbon, and air quality. It is wholly inadequate to tick them off with a couple of brief passing references and then fail to follow through with concerted actions and programmes. According to the World Health Organisation, 90% of the world's population has air pollution problems and the only places in England with air fit to breathe are the West Country, the Lake District, Northumberland and the centre of the Peak District: http://www.independent.co.uk/life-style/health-and-families/health-news/air-pollution-who-lung-cancer-heart-disease-stroke-deaths-public-health-emergency-fossil-fuels-a7332261.html. Carbon reduction and improving air quality should dominate decision making for national and local government and for all statutory bodies, of which TfN will almost certainly soon be one, especially after two rulings of the Supreme Court that the UK government have not been meeting their statutory obligations. Yet this does not appear to be the case.		reduce emissions across the strategic road and rail networks.
M Ibbotson **Hull City Council**	No comments to make at this time.	Noted	N/A
M McKervey **NABARRO LLP**	No questions or comments to make.	Noted	N/A
C Warburton Senior Advisor Transport **Natural England**	This response to consultation was detailed and comprehensive and made a number of important suggestions in relation to the ISA and HRA methodologies. Advice was provided relating to additional baseline information and plans and policies to be considered. A small number of additional sites which have been proposed for designation as SPAs were also highlighted. In relation to the ISA Framework, a number of suggestions were made for small amendments to ISA Objectives 2, 5, 7, 9 and 15, or to their decision	Noted	Amendments were made to the ISA Objectives, HIA Sub-Objectives and relating decision making questions as appropriate and the suggested baseline information considered during the assessment. A HRA of the proposed STP has been carried out and discussions are ongoing with Natural England relating to this. Comprehensive note is also made within the STP relating to the

Respondent	Overview of comments	Response	How has this issue been addressed?
	making questions. In addition, a small number of proposed amendments were made in relation to Health Impact Assessment sub-objectives and their decision making questions. Finally, a number of proposals and suggestions were made in relation to the required monitoring of the STP and notes were made on the importance of Green Transport Corridors.		need for further HRA in relation to any potential interventions derived from the STP which could have a direct or indirect effect on sites designated under the Habitats and Birds Directives. See for example Page 93 of the STP, which states “Any potential direct or indirect impacts on these sites that may arise from new and/or upgraded transport interventions will be appropriately assessed, mitigated, and/or compensated for, in-line with existing best practice and relevant legislation across the life span of the Plan. This would include European designated sites (including Ramsar sites), when necessary, Habitats Regulation Assessment”. This text forms part of a key Strategic Theme to the STP (‘Ensuring a sustainable investment programme’) and as such is a fundamental part of the plan. This is in keeping with a key recognition made within the objectives of the STP (Page 11) of “ensuring that new infrastructure is designed to minimise negative impacts on both the natural and built environment, including a negative impact on biodiversity” and note is made on Page 91 of the STP as to how this may be done – through further appraisal and analysis, where “Environmental considerations will continue through to the construction and operation of the individual schemes, through the implementation of effective Environmental Management Plans. As such, the mitigation and recommendations made in the

Respondent	Overview of comments	Response	How has this issue been addressed?
			Strategic Transport Plan are only a first step in protecting and where possible enhancing the environment, health and wellbeing of the North". The suggestions made relating to Monitoring were considered and informed the development of this Programme.
A Rae **Friends of the Earth / Campaign for Better Transport Volunteer**	This response to consultation was detailed and comprehensive, covering a range of issues. It is also supportive of the responses made by A Robinson and L Burns (both addressed above). In this instance, central to the response is the issue of how the STP addresses the issue of present and future carbon emissions.	TfN welcomes this comprehensive response on the early drafts of the STP documentation.	Development of the ISA and STP was undertaken in an iterative manner and considered all of the issues raised and amendments were made where these were considered appropriate in the light of the full range of considerations to be made in the development of both the ISA and STP. For example, carbon has been addressed in a number of places within the STP, including in the STP Objective 'Promote and support the built and natural environment' which notes that there is a need to "reduce emissions and impacts from air quality and carbon from transport". This STP Objectives also states that "This Plan will promote and support low carbon growth through the use of solutions that reduce carbon emissions and air quality impacts across the strategic road and rail networks". The STP also includes the following text (see STP Page 26) "Transport has a significant role to play in meeting commitments to reduce greenhouse gas emissions, to improve air quality, and to support and protect biodiversity. The Government has set a target to reduce carbon emissions by

Respondent	Overview of comments	Response	How has this issue been addressed?
			80% by 2050, which investment in the North's transport network can support". It is further noted on Page 33 that "Reducing carbon emissions is now imperative". Further, key consideration of Carbon is made within the Strategic Component 'Ensuring a sustainable investment programme'. The ISA found that this Strategic Component will act in a cross cutting manner across the STP to ensure that issues addressed within it are applied as core elements of the STP. The ISA also considered the issue of Carbon within a specific Objective and as such this was tested against all applicable components of the STP.
R Worrall Historic Environment Planning Advisor **Historic England**	This response made recommendations for a small number of amendments to the ISA Objective 8 relating to historic sites and the associated decision making questions. In addition, suggestions were made in relation to further PPP which could be considered, along with further consideration of potential Implications / Opportunities for the STP.	Noted	Amendments were made as appropriate to the ISA Objective and associated decision making questions. Consideration was also made of the suggested additional PPP and potential Implications / Opportunities for the STP.
Historic Environment Scotland	We have reviewed this in our role as a Consultation Authority under the above Regulations. This letter contains our views on the scope and level of detail of the information to be included in the Environmental Report. Please note that our view is based on our main area of interest for the historic environment in Scotland. It is our understanding that the Strategic Transport Plan aims to prioritise investments to improve the capacity, frequency, speed and reliability of the region's transport network. The geographical scope of the plan is the 11 Local Enterprise Partnerships as depicted in Figure 2.2 of the provided report. It is noted that the assessment	Noted	The ISA has considered the full range of heritage features within the STP area and the possibility of features within adjacent areas being affected.

Respondent	Overview of comments	Response	How has this issue been addressed?
	will cover the surrounding hinterland of this area and therefore may consider border areas of Scotland. The likelihood of transboundary significant effects on the historic environment of Scotland is unclear at this stage. However, we welcome the consideration given to the methodology of assessment for the historic environment outlined in the report.		
C Stelling Parliamentary & Briefings Officer **Public Health England**	This response highlights the fact that transport is an essential component in securing effective and sustainable economic growth, but has the potential to have a significant impact on people's health. It notes that the ISA (including HIA) are comprehensive in scope, though note is made to additional sources of PPP and issues to consider during the assessment.	Noted	The ISA included HIA and as such considered a wide range of potential health effects from the implementation of the STP. Recognition is also made within the STP to the potential for transport to have both negative and beneficial health effects (see for example Page 27 of the STP). Commitment is made to support work being undertaken by other organisations such as Public Health England to further explore how investment in transport can have positive impacts on people's health (see Page 93). This commitment is in line with the ambition on Page 9 of the STP to "work towards a sustainable transport network that will improve the health and wellbeing of residents and visitors to the North". Better access to health facilities is also outlined in the STP Objectives noted on Page 11 of the plan.
H May Historic Environment Service (**CADW**) Wales	CADW consider that the proposed transport plan could involve some trans-boundary connections. Therefore, we suggest that the Integrated Sustainability Appraisal should consider the impact of the proposals on the historic environment in Wrexham and Flintshire, including the Pontcysyllte Aqueduct and Canal World Heritage Site.	Noted	The ISA has considered the full range of heritage features within the STP area and the possibility of features within adjacent areas being affected.

Respondent	Overview of comments	Response	How has this issue been addressed?
S Payne **Tees Valley Combined Authority**	TVCA is content with the proposed approach on Sustainability Appraisal as it is consistent with what we'd expect. As a result, we therefore have no specific comments to make at this point.	Noted	N/A
C Willgoose Principal Transport Planner – North Wales **Welsh Government**	Concern over lack of recognition in the ISA of the relationship between the economies of the North of England and North Wales and the importance of cross border movements between these areas for freight, for journeys to work, for leisure, for access to services – the 2011 census recorded c.1million cross border movements per month. The review of the Plans and Programmes section in Appendix B does not include a consideration of the Wales Transport Strategy (2008), the Welsh Government's National Transport Finance Plan (2015) or the North Wales Joint Local Transport Plan (2015). Whilst Appendix C Section 11.3 does refer to North Wales, it does not explicitly recognise the cross border commuter and other trips.	The relationship between the economies of the North of England and North Wales is recognised in the development of a Strategic Development Corridor 'West and Wales'.	The issue of connections between the North of England and North Wales is the subject of a Strategic Development Corridor – West and Wales, which aims to improve connectivity for people and goods, to, from and through the important economic centres and assets of Cheshire, Liverpool City Region and Greater Manchester, with strategic connectivity in to North Wales and the Midlands. This Strategic Development Corridor has been assessed as part of the ISA. The Plans and Programmes section has been updated to include those noted, which were examined as part of the ISA.
P Nolan The Mersey Forest Team	Response made on behalf of The Mersey Forest Partnership but also makes reference to similar community forest initiatives across the north of England. The Mersey Forest is a government approved, long term plan to increase woodland cover on Merseyside and across north Cheshire to help to tackle some of the complex issues that the area faces. The Forest Partnership, made up of DEFRA Agencies and Local Authorities has a long term Forest Plan that should be considered your future appraisal. This plan is embedded in the National Planning Policy Framework and is included in Local Plans.	TfN welcomes the response from the Mersey Forest Team.	The supporting text to the Strategic Transport Plan objective 'Promote and support the built and natural environment' makes it clear that TfN will 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. Achieving this could include working with the Environment Agency, Natural England, community Forests and other

Respondent	Overview of comments	Response	How has this issue been addressed?
	Across the north of England there are similar community forestry initiatives, each with a plan and links to local and national planning. These are • City of Trees – Gtr Manchester • White Rose – West Yorks • South Yorkshire Forest - South Yorks • Heywoods – Hull and East Riding Together, the community forests across north England are working with Woodland Trust to develop a Northern Forest Prospectus, linking the existing forests, accelerating woodland planting, improving management of existing woodland and contributing to greenhouse gas reductions, active travel, biodiversity enhancement, jobs and growth. The work will also highlight the critical need to ensure the Ancient Semi Natural Woodlands and heritage trees are safeguarded and where possible buffered to enhance their longevity. Natural Capital as a concept may provide a helpful framework for the environmental elements of the Sustainability Appraisal. Natural Capital links into the Industrial Strategy Green Paper, and with the ongoing work of the Natural Capital Committee which is having an important role in the Government's forthcoming 25 year Plan for the Environment. The Community Forests and the Northern Forest are effective mechanisms to deliver natural capital growth and so provide an increasing range of ecosystem services that support people and the economy, as well as safeguarding biodiversity. There is a wealth of evidence to support the work of Community Forests in supporting active travel and in providing the setting for infrastructure improvements. However, given the strategic nature of this consultation we have focussed on the high level Plans and links to policy.		organisations to deliver complementary outcomes.

Respondent	Overview of comments	Response	How has this issue been addressed?
	Attached document highlighting the opportunity to link to a new strategic environmental initiative across northern England.		
Simon Bird Director Humber **Associated British Ports**	This response notes the key role that ports make in the economy and also notes that the approach to the ISA as set out in the Scoping Report is comprehensive, thorough and robust. The response also notes the major developments within the port sector, but also major challenges such as Climate Change. Further note is made of how ports can play a positive role in sustainability e.g. through development of brownfield sites.	TfN welcomes this response.	Ports and their connectivity, along with their role in the economy were considered as part of the development of the STP. For example on Page 11 of the STP, it is outlined as part of the plan objectives that the plan will "clearly articulate, prioritise and sequence strategic transport investment between important economic centres and assets, to our important ports and airports, to support the transformation of economic performance across the North". The locations of major and minor Ports are also noted on a map detailing 'Prime Capabilities around the North' on Page 17 of the STP and it is noted on Page 20 that ports can help strengthen the global reach of the North.

Table A-2 Consultation undertaken by CfBT

CfBT consultation overview
There was a strong view from the participants that carbon reduction and high environmental standards should be essential goals for TfN's strategies and its programmes. There is a view among some economists and business groups that reducing carbon, cutting air pollution and promoting high environmental standards impose costs on the economy and business, and hence these goals have to be traded off against economic goals. NGOs in general rejected this view. Instead they cited evidence that reducing carbon emissions and promoting high environmental standards brings economic as well as environmental benefits. They took the view that a good quality of life, with access to the National Parks, heritage and other features in the North were part of the North's attractions to businesses, investors and people, i.e. economic assets not barriers, and should be retained and enhanced, not traded off. Participants highlighted the West Yorkshire Local Enterprise Partnership's promotion of "good growth" as something that TfN might explore. This related to another point made by participants – that current transport appraisal gives insufficient weight to reducing carbon and air pollution and protecting and enhancing the quality of life, and too much to small time savings by travellers, especially motorists. There was also a view that it does not give sufficient weight to

CfBT consultation overview
access to jobs and services, particularly from rural communities and old industrial areas, and that TfN needs to reflect this in evaluating its strategies and proposals. Some participants talked of a “new model for the North” as a way of expressing this issue. Participants recognised that TfN’s focus is on strategic transport and pan-Northern measures and schemes. However, there was a strong view that TfN should seek to help improve transport across the North, including local transport. Ways to do this were suggested – e.g. providing support for local authorities through projects and programmes to look at carbon and public health outcomes, or assisting with frameworks for local policy makers for example with public transport accessibility mapping to help guide development towards locations that can be well served by public transport and away from car-dependent locations. It was also suggested that TfN could help local authorities and others across the North by creating an evidence base and giving access to research and intelligence, highlighting and sharing good practice in transport the North and elsewhere in the UK and abroad. We recognise that given TfN’s governance this could be challenging, but participants were clear that unless TfN is seen to help local as well as longer distance transport it will be seen as irrelevant to many communities in the North. The smart ticketing programme was seen as an example of a practical way that TfN could be seen to help communities across the North with supporting infrastructure, and was widely supported by participants. **Priority themes** The online surveys identified, and the workshops explored, some priority environmental and social themes. The feedback on these themes is summarised here and explored in more detail in the main report. • Access to jobs and services: there is enthusiastic support for improving transport connectivity to support economic activity and access to services. There is great potential perceived and support offered for connecting communities to the public transport network and integrating different transit systems. Smart ticketing and travel planning information are seen as big benefits that TfN’s work can deliver to an increasingly flexible and dispersed workforce. There is a strong view that these benefits should be available to every community across the North, not only those currently well served by public transport. • Carbon reduction: NGOs in this sector are acutely aware of the challenge of meeting essential and binding carbon reduction targets, and the critical role that transport planning plays. Without embracing carbon reduction as a goal of the STP instead of a constraint upon it, there will be a conflict in expanding travel while reducing carbon emissions. Respondents see opportunities for TfN to be a leader in moving to a low carbon future, through programmes of rail electrification and modal shift (such as Park & Ride infrastructure) away from motor vehicle use, and that this can bring economic as well as environmental benefits. • Air pollution: participants are concerned about the illegal levels of air pollution in many communities across the TfN area, and aware of the emerging legal judgements requiring Government action. As with carbon reduction, this is an area where binding targets will not be met without leadership from transport bodies. TfN has a great opportunity to show such leadership by making improving air quality a goal not a constraint in its investment programme, prioritising sustainable modes, promoting clean infrastructure and mitigating existing pollution sources. Additionally, respondents raised the following issues: • Landscape and heritage: the beauty of the natural and built environment are seen as part of what makes the North special, and as an active economic asset stimulating tourism, food production, as well as well as a valuable setting. Any new infrastructure is a potential threat so a strategic approach is welcomed to get the right locations and the right design. Respondents saw opportunities beyond statutory minimums for the Strategic Transport Plan to value these assets and safeguard them. They urged making the most of the existing infrastructure first, then where new provision is required, that sustainable low impact options are prioritised. • Biodiversity and habitats: respondents were well aware of the loss of biodiversity recorded in the UK, contrary to policy targets. Again, this was an area where transport strategy was seen to have great potential risk of erosion and fragmentation of habitats, yet also potential opportunities to plan the network to minimise impacts by joining up policy. One option suggested is that TfN could work with specialist NGOs to develop a scorecard to evaluate development sites in terms

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of their importance for biodiversity. There is also potential for TfN to lead in retrofitting existing transport infrastructure to reduce its adverse environmental impact. • Flood protection: Respondents recognised the importance of this issue for the North given extreme weather events of recent years, but felt this was an issue already being addressed so less of a priority for attention than some others. TfN has a role in sharing best practice in location, design and management of infrastructure to address flood risk. Stopping the erosion of protective woodland, respecting flood plains, and mainstreaming SUDS and similar technical solutions into all schemes, were seen as critical. In discussing these themes with stakeholders, three further cross-cutting themes have emerged which, while outside the initial scope of this report, are, stakeholders believe, critical to successful implementation of a sustainable Strategic Transport Plan. • Integration with local services. We were repeatedly reminded that all journeys are local at some stage and many vital journeys are wholly local. Intensification of the region's core cities will increase this trend and the role of local and metropolitan transport authorities remains vital. TfN can share best practice and provide a quality framework, encouraging a levelling up of the local service provision on which many journeys depend. • Joining up transport planning with spatial planning. Virtually all responses touched on this issue. Whether at a macro level – where the North's activity should be centred – or at the more local level of where new homes and jobs should be located – having a clear view on spatial planning priorities, and where appropriate influencing these to locate development near transport hubs, was seen as critical to TfN's Strategic Transport Plan being effective in reality. South Yorkshire's "traffic light" site appraisal and London's PTAL model are examples of how these connections can be made. • Equality and accessibility. This principle was raised on multiple levels: access to participation in the development of the STP; access to specific modes, locations or services; TfN's role in addressing 'transport poverty' and improving accessibility and affordability of transport services across the region.

Appendix B. Policy Documents Reviewed for ISA

Please see the TfN STP ISA Scoping Report for details of Policy Documents reviewed in relation to the ISA.

Appendix C. Baseline Data

Please see TfN STP ISA Scoping Report for further detail on initial Baseline Data gathered.

Appendix D. Updated Baseline (Business as Usual)

The anticipated baseline trends are shown below in Appendix D.1. This table presents a summary of the current conditions, likely future trends and sensitivity to change against the ISA objectives using a simple three-point normative scale as follows:

1. Current Conditions – Good / Moderate / Poor
2. Sensitivity to change – High / Medium / Low
3. Current Trends – Improving / Stable / Declining
4. Information Quality – High / Medium / Low

This scale is depicted as follows:

Good	High	Impr	High
Mod	Med	Stable	Med
Poor	Low	Decl	Low

Sensitivity to change in the context of ISA represents the extent to which, for instance, ecological thresholds may be close to being breached or carrying capacity exceeded, such that relatively small changes might be likely to induce disproportionately large effects, which in some instances might have wide-ranging and/or unexpected consequences. An example might be the decline of a particular wildlife population below the level at which it is viable in a particular habitat.

The quality of the information base gives an indication of the certainty with which the other three parameters are known, and this is presented using a similar colour-coded three-point scale (high/medium/low).

Table D-1 has been prepared by cross checking the indicators in the baseline against the ISA objectives, analysing the data for each indicator, and drawing together this analysis in summary form using the scoring method described above together with a concise commentary on key baseline features. The likely future trends without the implementation of the Plan have been used to inform the assessment of the Plan in the next stages of the ISA.

TfN, within the STP, in describing the ‘Business as Usual’ scenario have assumed the future will be like the past, reflecting both historical experience and substantial levels of previous policy intervention and investment, as well as expected UK trends. It is to be noted that this is distinct from a ‘Do-Nothing’ Scenario.

Note that the future projected baselines depicted below incorporate all known committed developments and plans which are outside the control of TfN – in effect a ‘Business as Usual’ scenario. It is also important to note that the baseline information contained within the ISA Scoping Report formed the starting point for this exercise, but account has now been taken of additional sources e.g. research on predicted trends in car fleet changes to inform the development of the future baseline.

D.1. Anticipated Baseline Trends

Table D-1 Anticipated Baseline Trends

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	Poor	Medium	Improving	Medium	Moderate	Medium	Improving	Medium	Moderate	Medium	Improving	Medium	***Current – Short Term*** Overall CO_2 emissions vary between regions, with the North West contributing 10% of UK emissions and the North East approx. 5%. In the UK transport accounts for approximately a quarter of CO_2 emissions, with road transport being the majority source. Variance between regions is likely to be due to a number of factors such as dispersion of the population. However, total UK GHG have declined by 38% between 1990-2015[1] and are set to decline further. By 2020 it is predicted that renewables will provide 30% of energy in the UK and it is predicted that 'Plug In' vehicles will account for approximately 6% of new car sales by 2020 (mid-range forecast)[2]. ***Medium Term*** There is considerable uncertainty regarding estimates of carbon emissions as those from individual road vehicles have fallen in recent decades due to improvements in engine technology, though it is recognised these benefits have been outweighed by an overall increase in vehicle numbers and movements. Nevertheless, there is significant potential for emissions reductions in the Medium Term through continued improvement in fuel efficiency for conventional vehicles, switching to alternatively fuelled vehicles and from changing behaviour. This potential will be aided by schemes such as those to promote and support the use of Electric Vehicles and as such, it is anticipated that the uptake of EV will continue to grow. This will reduce CO_2 emissions from road transport. Total GHG emissions from transport in 2035 are estimated to be 109 $MtCO_2e$, down from 119 $MtCO_2e$ in 2017[3]. It is to be noted that Government forecasts for road traffic growth range from 19% to 55% growth between 2010 and 2040, with growth particularly strong on the Strategic Road Network (up to 60%)[4]. ***Long Term*** Engine technology is increasing efficiency and there is a gradual roll out of EV charging points, with fresh government initiatives in this area for example through a refresh of the 'Plug In Vehicle Infrastructure strategy'[5]. This will help make EV a more attractive vehicle option and may lead to reductions in GHG in the mid to long term. It is the UK Government aim for almost every car and van to be zero emission by 2050[6].

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/589602/2015_Final_Emissions_Statistics_one_page_summary.pdf
[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3986/plug-in-vehicle-infrastructure-strategy.pdf
[3] https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2016 Annex A
[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411471/road-traffic-forecasts-2015.pdf
[5] https://www.gov.uk/government/organisations/office-for-low-emission-vehicles/about
[6] https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide/supporting_documents/Draft%20Revised%20AQ%20Plan.pdf P.1

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	Moderate	Medium	Stable	Medium	Moderate	Medium	Stable	Medium	Moderate	Medium	Stable	Medium	***Current – Short Term*** There are a number of statutory and non-statutory sites designated for their importance for nature conservation and geodiversity within the STP area. Many of the Local authorities within the STP area have produced Biodiversity Action Plans (BAPs) to target priority habitats and species[7] that require conservation efforts to improve their status and distribution at the local level. Constant pressures from development (direct and indirect), climate change, invasive alien species and inappropriate management practices have the potential to adversely affect the integrity of local, national and international (European) designated sites, and the status and distribution of priority habitats and species. However, there are opportunities through development to protect and enhance biodiversity through improving green infrastructure. One such example to aid certain species is the National Pollinator Strategy[8], produced by DEFRA to support bees and other pollinators. A number of organisations have signed up to the strategy, including Network Rail and the Highways England. ***Medium Term*** The EU is committed to halt the loss of biodiversity by 2020[9], which is supported in UK policy by the Biodiversity 2020 strategy[10] and the National Planning Policy Framework (NPPF)[11]. Highways England share a commitment to this target in its Biodiversity Plan[12], as does Network Rail[13]. In the UK, there is a statutory basis for planning to seek to minimise impacts on biodiversity and provide net gains in biodiversity where possible through Section 40 of the Natural Environment and Rural Communities Act 2006[14]. This places a statutory duty on all public authorities to have regard, in exercise of their functions, to the purpose of conserving biodiversity. In consideration of this duty, policies should seek to make a significant contribution to the achievement of the commitments made by government in its Biodiversity 2020 strategy. Transport interventions will need to aim to avoid and/or minimise potentially adverse impacts through development and put an emphasis on no net loss[15] of biodiversity in order to achieve these targets. Strategies aiming towards the wider adoption of ultra-low emissions vehicles and particularly electric vehicles will result in positive impacts on local biodiversity through reduced emissions and occurrences of hydrocarbon, oil and associated fluid spillages.

[7] http://jncc.defra.gov.uk/page-5705
[8] https://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england
[9] http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
[10] https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services
[11] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[12] https://www.gov.uk/government/publications/biodiversity-plan
[13] https://www.railengineer.uk/2014/08/22/biodiversity/
[14] https://www.gov.uk/guidance/natural-environment#biodiversity-and-ecosystems
[15] http://ec.europa.eu/environment/nature/biodiversity/nnl/index_en.htm

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													Long Term Statutory duties concerning planning policy and existing commitments to no net loss of biodiversity within the transport infrastructure sector have the potential to improve the state of nature within the UK, specifically in the North of England. In addition to the ongoing commitments to no net loss by bodies such as Highways England, the Green Infrastructure Strategy proposed by the European Commission aims to promote the development of Green Infrastructure within the transport sector, by reducing the carbon footprint of transport, mitigate the negative effects of land uptake and fragmentation, and boost opportunities to better integrate land use, ecosystem and biodiversity concerns into policy and planning. In the UK, Natural England's Green Infrastructure Guidance[16] advises and facilitates green infrastructure planning, which aims to improve biodiversity.
3. Conserve and enhance the international sites (HRA specific objective)	Moderate	Medium	Stable	Medium	Moderate	Medium	Stable	Medium	Moderate	Medium	Stable	Medium	***Current – Short Term*** There are a large number of sites designated for their importance for nature conservation across the STP area, with the north of England having 463 SACs, 241SPAs, 11 Ramsar sites and 1131 SSSIs. All these sites are afforded high levels of protection under international and national legislation, and it is anticipated that the number of designated sites will increase over the Plan period. The Natural England condition summary for SSSIs (including units that cover SPAs, SACs and Ramsar sites) shows that 94.22% of these sites in the North East are at favourable or unfavourable but recovering status. However, it should be noted that these sites are subject to pressures from development (direct and indirect impacts), for example, increased accessibility (recreation) to designated sites has the potential to adversely impact on the integrity of these sites. Similarly, increasing levels of transport movements could increase levels of disturbance – many of the existing designated areas are in proximity to transport infrastructure. In addition to threats from development, these sites are subject to pressures arising from climate change, invasive species and inappropriate management practices, all of which can threaten habitat condition and species populations. ***Medium Term*** It is expected that new interventions may have the potential to negatively affect international designated sites. However, the high level of protection afforded to international designated sites necessitates the undertaking of formal assessment for any plan or project where this risk is encountered. Under UK legislation, the Conservation of Habitats and Species Regulations 2010 [17] require competent authorities to carry out a Habitat Regulations Assessment (HRA) of "plans or projects" that may have a "likely significant effect" on a European site. Such plans or projects can only proceed if the competent authority is convinced they will not have an "adverse effect on the integrity of a European site" and all other options have been considered. If the plan or project will have adverse effects, or if there is uncertainty over its effects, it can only be granted consent if certain derogations apply[18].

[16] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj5i7L_ovXWAhXIKsAKHfxxBnYQFggrMAA&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F94026&usg=AOvVaw0iRg5r3iSbZ7HlmLRTXDgw
[17] http://jncc.defra.gov.uk/page-1379
[18] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82706/habitats-simplify-guide-draft-20121211.pdf

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													Long Term It is considered that application of HRA will highlight any potentially adverse impacts on international designated sites arising from new or improved transport interventions. The HRA methodology focuses on the principles of the mitigation hierarchy, as outlined in Environmental Impact Assessment, which firstly aims to avoid, then minimise/reduce any negative effects on designated sites. If any adverse impacts cannot be adequately mitigated for, then compensatory measures would be required.
4. Protect and enhance air quality	Poor	Medium	Declining	Medium	Poor	High	Improving	Medium	Moderate	High	Improving	Medium	***Current – 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. Local authorities across the North have designated over 133 AQMAs aimed at addressing these local issues. ***Medium Term*** It is expected that local instances of poor air quality will become more severe. Congested and slow moving traffic will be experienced more frequently resulting in higher levels of vehicle emissions localised concentrations and potential issues with local air quality especially when including the likely diversion of traffic due to congestion onto less appropriate roads with adjacent housing. To address this, the UK has adopted ambitious, legally-binding targets to reduce significantly emissions of NOx and four other damaging air pollutants for 2020 and 2030[19]. ***Long Term*** Fossil fuelled Engine technology is increasing in efficiency and there is a gradual roll out of EV charging points. This will help make EV a more attractive vehicle option and may lead to improvements in air quality in the mid to long term. It is the UK Governments aim that almost every car and van should be zero emission by 2050[20]. Although curtailed in some parts due to the extent of network adaptation required, there are current plans to increase the electrification of the rail network including the introduction of bi-mode trains (running on electric where installed and diesel through remaining non-electrified lines). Non-electric trains can have an adverse effect on air quality, especially in and around stations.
5. Increase resilience of the transport network to extreme weather events and a changing climate	Poor	Medium	Declining	Medium	Poor	Medium	Declining	Medium	Poor	Medium	Declining	Low	***Current – Short Term*** The climate of the UK is already changing and risk assessments have shown that areas across the north of England are already impacted by extreme weather events, flooding and heat waves which seriously damage property and threaten lives. Measures are being taken at present to address many of the issues raised by a changing climate – for example local authorities are encouraged under the National Planning Policy Framework to mitigate and adapt to climate change[21]. One such way of mitigating transport schemes is through the introduction of SuDS and these are being incorporated into new road drainage schemes. ***Medium Term*** The UK's climate is expected to continue to change and this likely to be manifested particularly through changes in weather patterns and increased frequency and intensity of storms. For example, the length of road and railway at

[19] https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide/supporting_documents/Draft%20Revised%20AQ%20Plan.pdf P.12
[20] https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide/supporting_documents/Draft%20Revised%20AQ%20Plan.pdf P.1
[21] https://www.gov.uk/guidance/national-planning-policy-framework/10-meeting-the-challenge-of-climate-change-flooding-and-coastal-change

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. (prediction of four degree Celsius change by 2080 made by CCC 2017[22]). ***Long Term*** By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. (CCC 2017).
6. Protect and enhance the inland and coastal water environment	Poor	Medium	Improving	Medium	Moderate	Medium	Improving	Medium	Moderate	Medium	Improving	Low	***Current – Short Term*** Water quality has been impacted severely across the north of England – often by transport activities. Currently across England 17% of surface water bodies are at good or better ecological status or potential[23], with 53% of groundwater bodies at good chemical status (69% at good quantitative status). ***Medium Term*** Specific measures are being introduced under the WFD to address water pollution from the transport network, in particular from roads. The use of SuDS is also becoming a more common / standard element to road drainage design. The WFD anticipates that measures such as these will help improve water quality status in future. By 2021 6.3% of surface water bodies in England are expected to improve by at least one ecological status class. ***Long Term*** Continued measures under the WFD are likely to continue to improve water quality. Increased usage of EV and/or Hybrid could also lead to an improvement in water quality as it will lead to the removal of large quantities of hydrocarbons from the road network. This improvement would be most particularly noted in the event of an accident, where the rupturing of fuel tanks or lines would not be an issue.
7. Protect and conserve soil and remediate / avoid land contamination	Good	Medium	Stable	Medium	Good	Medium	Stable	Medium	Good	Medium	Stable	Low	***Current – Short Term*** There is a range of Agricultural Land Classifications across the north of England, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a). Estimates are that Grades 1 and 2 together form about 21% of all farmland in England, with sub-group 3a also covering about 21%[24]. The industrial legacy of the North of England means that there are large areas of contaminated land, particularly in urban areas. Further contamination of soil resources could occur due to deposition of pollution via air or water or through spillage of contaminants, though there are also opportunities for remediation. ***Medium Term*** Agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

[22] https://www.theccc.org.uk/wp-content/uploads/2015/10/CCRA-Future-Flooding-Main-Report-Final-06Oct2015.pdf.pdf
[23] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/514944/National_evidence_and_data_report.pdf
[24] http://publications.naturalengland.org.uk/publication/35012

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													Long Term Agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. Across all three time periods it is considered likely that a diverse mix of agricultural activities across the study area will remain along with a large variation in farm holdings and agricultural related businesses. Transport infrastructure (both existing and future) are likely to continue to act to sever some holdings. Many sites of contamination are unknown. It is a fact that contamination will continue to occur, but also that remediation will continue to take place.
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	Moderate	High	Stable	Medium	Moderate	High	Stable	Medium	Moderate	High	Stable	Medium	***Current – Short Term*** Of pre-eminence in cultural heritage terms within the north of England are the World Heritage Sites of Durham Castle and Cathedral, Liverpool Maritime Mercantile City, Frontiers of the Roman Empire (Hadrian's Wall), Saltaire and Studley Royal Park. It is anticipated that these sites will continue to receive the highest levels of protection. There are, of course, a wide range of other historic and cultural heritage features located across the region and which span the full range of human settlement, from the prehistoric to the present. 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. ***Medium Term*** Increased levels of development in the North (as noted under NPIER) could increase the potential for disturbance to assets and their setting. Levels of protection are also likely to increase for those tentative WHS such as Jodrell Bank, the Lake District and the twin Monastery of Wearmouth and Jarrow. 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 physical access to sites of cultural and historic importance will improve social awareness and enjoyment of such assets without reducing their quality and distinctiveness. ***Long Term*** Further increased levels of 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. Improvements to strategic transport networks will be essential to alleviate projected traffic congestion and pressures on historic towns, landscapes as well as designated heritage assets such as bridges, roman roads, canals and railways. As recognised by Historic England, well-designed traffic management proposals, that recognise and complement local and regional character, can be a positive addition to the historic environment.
9. Protect and enhance the character and quality of landscapes	Moderate	High	Stable	Medium	Moderate	High	Stable	Medium	Moderate	High	Stable	Medium	***Current – Short Term*** The landscapes and townscapes across the STP area vary greatly, with various different landscape types, ranging from hills of upland moorland to valleys, low lying plains and estuaries, such as the Humber and the Mersey. Most of the STP area is rural with isolated farmsteads but there is also a full range of settlement types from the smallest hamlet to the largest urban conurbations.

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
and townscapes													There are also five National Parks across the STP area and 34 AONBs designated nationally and given the highest state of protection in law and Government policy for their landscapes and scenic beauty. Countryside Quality Counts showed that between 1999-2003 existing landscape character was being maintained in 51% of England' s landscapes[25]. In many areas, the landscape character has been sustained or strengthened. Areas where the landscape character was neglected or diverging are generally close to major centres of population and transport routes. ***Medium Term*** Those areas currently protected for their landscape will still receive that protection. Other areas may deteriorate due to increased urbanisation or along major transport corridors and as such the overall trend is likely to decline. ***Long Term*** Those areas currently protected for their landscape will still receive that protection. Other areas may deteriorate due to increased urbanisation or along major transport corridors and as such the overall trend is likely to decline.
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	Moderate	High	Improving	Medium	Moderate	High	Improving	Medium	Moderate	High	Improving	Low	***Current – Short Term*** By its nature, transport involves the use of natural resource through fuel use or the use of extractive resources such as aggregates or hydrocarbons for construction purposes. While modern construction practices encourage the use of recycled materials, this does not account for the full requirement of materials. Nevertheless, it is anticipated that the ratios of recycled to new materials would be maintained as a minimum, with perhaps greater use of recycled materials as technologies and construction techniques develop. UK generation of commercial and industrial (C&I) waste was 27.7 million tonnes. This has fallen from 32.8 million tonnes in 2012. The recovery rate from non-hazardous construction and demolition waste in the UK in 2014 was 89.9 per cent. There is an EU target for the UK to recover at least 70 per cent of this type of waste by 2020[26]. It is to be noted that England has a higher rate of recovery from non-hazardous construction and demolition waste at 91.4% (2014) than the UK as a whole. ***Medium Term*** Under the EC Waste Framework Directive, there is a target for the UK to recover at least 70% of non-hazardous C&D waste by 2020, which is currently on target. Furthermore, a continued annual increase each year to the landfill tax, in addition to higher disposal charges and increasing costs of materials will encourage more intelligent and efficient means for the use and reuse of natural resources in the construction sector. It is to be noted that the NPIER forecasts that there will be significant levels of development (direct transport related along with new housing and employment facilities) – it is anticipated that this is likely to increase levels of waste produced e.g. during construction, with likely implications for reuse, recycling etc. With respect to hydrocarbon use, the Rail Industry's fourth Long Term Passenger Rolling Stock Strategy estimates the proportion of electrically-powered vehicles will rise from 70 per cent to more than 90 per cent by 2034[27].

[25] http://webarchive.nationalarchives.gov.uk/20140712063806/http://www.naturalengland.org.uk/ourwork/landscape/englands/character/cqc/default.aspx
[26] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/593040/UK_statsonwaste_statsnotice_Dec2016_FINALv2_2.pdf
[27] https://www.raildeliverygroup.com/media-centre/press-releases/2016/762-2016-03-21.html

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													Long Term The increase in traffic levels on Great Britain's roads in 2016 was nearly twice as high as previously estimated, rising by 2.2% to 323.7 billion miles (bvm). Notably the Department for Transport predicts traffic levels on the Strategic Road Network to rise by 46% by 2040. Similar stress is expected on rail networks where passenger numbers have doubled over the last 20 years and are expected to continue to rise. However, an increased use of Electric Vehicles (road and rail) and more efficient vehicle engines is anticipated to lead to a reduction in the use of hydrocarbon resources. It is the UK Government aim to for almost every car and van to be zero emission by 2050.
11. Enhance lower carbon, affordable transport choice	Poor	Medium	Improving	High	Moderate	Medium	Improving	Medium	Good	Medium	Improving	Medium	***Current - Short Term*** At present the vast majority of transport modes in the UK are traditionally fuelled by hydrocarbons. Transport accounts for a quarter to UK greenhouse gas emissions and Government is working to reduce emissions by promoting public transport choices and supporting the market for innovative forms of transport and encouraging a move to cleaner and lower carbon vehicles[28]. Government has introduced a range of policies and schemes to encourage this switch, for example there are incentives to encourage businesses to research technology to help reduce harmful emissions from freight[29] while a scheme has been introduced that means that all vehicles that have been approved as ultra-low emission vehicles are eligible for the Electric Vehicle Homecharge Scheme[30]. The UK now has 115,000 ULEVs on the road[31]. Electrification of the rail network is also being undertaken[32], but despite significant progress, this will be a long process and subject to continued high levels of investment. ***Medium Term*** ULEVs should become progressively more affordable as economies of scale are realised and they could provide savings for consumers compared to equivalent internal combustion engine cars by the mid-2020s or sooner. As a result, at least 30 per cent of new car sales are expected to be ULEVs by 2030, and possibly as many as 70 per cent. For new vans, up to 40 per cent of sales could be ULEVs by 2030. ***Long Term*** To meet Government targets, almost every car and van will need to be zero emission by 2050[33] and emissions from HGVs will also need to reduce significantly. It is important to note that Aviation and shipping emissions are not included within UK carbon targets but the trajectory is consistent with a 2050 target which would include those emissions.

[28] https://www.gov.uk/government/policies/transport-emissions
[29] https://www.gov.uk/government/news/uk-firms-challenged-to-cut-freight-emissions
[30] https://www.gov.uk/government/publications/electric-vehicle-homecharge-scheme-eligible-vehicles
[31] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf
[32] https://www.networkrail.co.uk/our-railway-upgrade-plan/key-projects/electrification/
[33] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf P85

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
12. Enhance long term economic prosperity and promote economic transformation	Poor	High	Improving	High	Moderate	Low	Improving	High	Moderate	Low	Improving	High	***Current - Short Term*** Currently the population of the North is 15.8 million, of whom 7.5 million are in employment and a GVA of £317 billion. Tax receipts for the North of England are approximately £115 billion. There remain persistent differences in GVA in the North compared to the rest of England, with this consistently around 25% below average for the rest of England. There is a typical gap in income per person of £4,600 between the North and the UK average. ***Medium Term*** As noted in the STP, population, employment and GVA is anticipated to grow under the Business as Usual scenario with tax receipts of approximately £200 billion in the North of England. ***Long Term*** As noted in the STP, under the Business as Usual scenario, population is anticipated to grow to 18.1million, employment to 8.3million and GVA to £603 million by 2050, with tax receipts of approximately £200 billion in the North of England.
13. Coordinate land use and strategic transport planning across the region	Poor	Low	Stable	High	Moderate	Low	Stable	High	Moderate	Low	Stable	High	***Current – Short Term*** At present, transport planning and land use planning across England are organised on a local / combined authority level. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. ***Medium Term*** It is anticipated that current arrangements for land use and strategic transport planning will continue. ***Long Term*** It is anticipated that current arrangements for land use and strategic transport planning will continue.
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	Moderate	Medium	Improving	Medium	Moderate	Medium	Stable	Medium	Moderate	Medium	Stable	Medium	***Current - Short Term*** There is considerable diversity of social groups across the STP area, and this diversity varies across the 11 LEP areas. Deprivation levels are highest in Tees Valley, Greater Manchester and Liverpool City Region LEPs. Diversity and deprivation will have a considerable impact on access to opportunity. There is an increased focus on inclusivity and accessibility in general planning policy, with this being fundamental to many schemes. However, affordability often remains an issue, particularly for those in deprived areas. ***Medium Term*** Planned levels of investment in infrastructure and transport, along with an increased focus on communities will provide some benefits to access of opportunity, through improved access to employment, and other vital community facilities (healthcare, education, social and leisure facilities, food shops and religious establishments). Services / facilities should be designed to be fully inclusive, and therefore enhance access of opportunity for those who have specific travel needs/requirements (i.e. the mobility impaired, those with physical or learning disabilities or unconfident travellers). Increasing the range of transport options available, provided priced in line with existing services, may provide enhanced accessibility, particularly for those in deprived areas or those without access to private vehicles.

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
													Long Term Continued planned levels of investment in infrastructure and transport, along with an increased focus on communities will provide improvements to access of opportunity, provided services / facilities are inclusive for all – particularly those who have specific need (i.e. mobility impaired, disabled, unconfident travellers such as the elderly and children)...Affordability of transport will remain an issue for those in the most deprived areas, however new services/measures should enhance accessibility for these groups, provided they are priced suitably.
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	Moderate	Medium	Improving	Medium	Moderate	Medium	Stable	Medium	Moderate	Medium	Improving	Low	***Current - Short Term*** An increased national focus on health and well being will bring health related benefits, although inequalities in health still exist. Improvements to transport infrastructure will improve access to health services, employment and community facilities which will bring health benefits. Local authorities across the North have designated over 133 AQMAs identifying the poor air quality within the STP area. This will have an impact on health and wellbeing – particularly for those with respiratory conditions. The life expectancy from the Northern region is slightly below that of England as a whole. Women have a life expectancy of 82.2 compared to the England value of 83.0. Northern men have a life expectancy of 78.1 compared to England of 79.1. The lowest life expectancies are in Greater Manchester and Liverpool City Region and some of the highest life expectancies Cheshire and Warrington and York, North Yorkshire and East Riding[34]. The Northern region has a slightly higher percentage of people in bad and very bad health compared England, 7% and 5% respectively [35]. ***Medium Term*** It is expected local instances of poor air quality will become more severe as a result of increased road traffic. Improvements in accessibility to health care services as well as employment locations, community facilities, schools and food shops will make some improvement to the health and wellbeing of citizens. Enhanced service provision will also improve health and wellbeing through improvements to facilities and access to these, provided (infrastructure, amenity and transport) services are fully inclusive and provide affordable options for those on limited incomes. Inequalities in health are still likely to exist. ***Long Term*** An increasing focus on health and wellbeing across infrastructure and transport will provide some benefits to health and wellbeing for all in terms of improved amenity (healthcare services, leisure and recreation, employment etc.) and access to these services by a range of transport options. The UK Government's aim that almost every car and van should be zero emission by 2050 will also have a considerable impact on air quality and subsequently health.
16. Promote community safety and reduce crime and fear of	Poor	Medium	Declining	Medium	Poor	Medium	Stable	Medium	Moderate	Medium	Improving	Low	***Current - Short Term*** Central Manchester is the second highest area within the UK for all crimes (August 2017[36]), with Leeds and Newcastle being 4th and 5th. Transport interventions include safety as a primary objective and therefore some improvement is being made on safety when travelling. However, crime levels are generally rising across the area.

[34] https://www.ons.gov.uk - Slope index of inequality (SII) in life expectancy (LE) at birth for males and females by English Regions, 2009 to 2013
[35] https://www.ons.gov.uk - General Health (QS302EW)
[36] http://www.ukcrimestats.com/Constituencies/

ISA Objective	Current and Projected Baseline												Commentary
	Current – Short Term				Medium Term				Long Term				
	Cond	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	Condition	Sensitivity	Trend	Info Quality	
crime for all citizens (CSA specific objective)													***Medium Term*** An increasing focus on community safety and reducing crime is likely to provide some benefits in terms of crime levels, although these are still likely to be high within the cities. Safety and security measures being a fundamental design consideration to all new infrastructure (built environment and transport) will provide enhancements to the overall feeling of safety and security. ***Long Term*** Continuing focus on community safety and reducing crime is likely to pose some benefits in terms of crime levels, although crime is still likely to be highest within cities. New infrastructure developed will likely minimise crime and create a welcoming environment, through embedded safety and security measures.

Appendix E. Compatibility Assessment

E.1. Initial and Updated STP Compatibility Assessments Overview

On both the initial and updated STP assessments, the following compatibility criteria have been used:

✓	Broadly compatible
X	Potential Conflict
?	Dependent upon nature of implementation measures
NR	Not relevant

An overview of the initial compatibility assessment is shown below.

Table E-1 Initial Compatibility Assessment Overview (March 2017)

		Integrated Sustainability Appraisal Objectives															
TfN Strategic Transport Strategy Objectives		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)	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	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	Improve health and well-being for all citizens and reduce inequalities in health	Promote community safety and reduce crime and fear of crime for all citizens
i.	Transform Economic Performance	?	?	?	?	✓	?	?	?	?	?	?	✓	✓	X	X	X
ii.	Promote and support the built and natural environment	✓	✓	?	✓	?	✓	✓	✓	✓	✓	?	✓	✓	?	?	?
iii.	Improve opportunities across the north	?	?	?	?	?	?	?	?	?	?	?	✓	?	X	X	X
iv.	Increase efficiency, reliability and resilience on the transport system	✓	?	?	✓	✓	?	?	?	?	✓	✓	✓	?	✓	✓	✓

The updated STP compatibility assessment overview is shown below.

Table E-2 Updated STP Compatibility Assessment Overview (October 2017)

		Integrated Sustainability Appraisal Objectives															
	TfN Strategic Transport Plan Objectives	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)	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	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	Improve health and well-being for all citizens and reduce inequalities in health	Promote community safety and reduce crime and fear of crime for all citizens
i.	Transform Economic Performance	X	?	?	X	?	?	?	?	?	?	X	✓	✓	✓	✓	✓
ii.	Promote and support the built and natural environment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	NR
iii.	Improve opportunities across the north	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	?	✓	✓	✓	✓	✓
iv.	Increase efficiency, reliability and resilience on the transport system	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	✓	✓	✓	✓	✓

Table E-3 Updated STP Compatibility Assessment – STP Objective 1

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
1.	Transform Economic Performance - To secure investment in transport between economic centres and assets to support transformation of the North's economic performance. This objective focuses on addressing the challenges identified in the NPIER and securing investment in transport interventions that improve productivity across the North and delivers agglomeration benefits between the North's important economic centres and assets, both rural and urban.	The STP will: • Clearly articulate, prioritise and sequence strategic transport investment between important economic centres and assets, to our important ports and airports, to support the transformation of economic performance across the North; and • Ensure TfN's long term Investment Programme aligns with and complements the development and delivery of local transport, development and economic plans and policies.	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	X	There is a potential conflict as it is the intention of this STP Objective to result in greater transportation facilities which will facilitate more movement. As such this could result in greater GHG emissions - at least in the short term.
			Protect and enhance biodiversity, geodiversity and the green infrastructure network	?	Compatibility is dependent upon the nature of the implementation measure
			Conserve and enhance the international sites (HRA specific objective)	?	Compatibility is dependent upon the nature of the implementation measure
			Protect and enhance air quality	X	There is a potential conflict as it is the intention of this STP Objective to result in greater transportation facilities which will facilitate more movement. As such this could result in poorer air quality - at least in the short term.
			Increase resilience of the transport network to extreme weather events and a changing climate	?	Compatibility is dependent upon the nature of the implementation measure
			Protect and enhance the inland and coastal water environment	?	Compatibility is dependent upon the nature of the implementation measure
			Protect and conserve soil and remediate / avoid land contamination	?	Compatibility is dependent upon the nature of the implementation measure
			Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	?	Compatibility is dependent upon the nature of the implementation measure
			Protect and enhance the character and quality of landscapes and townscapes	?	Compatibility is dependent upon the nature of the implementation measure
			Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	?	Compatibility is dependent upon the nature of the implementation measure
			Enhance lower carbon, affordable transport choice	X	There is a potential conflict as it is the intention of this STP Objective to result in greater transportation facilities which will facilitate more movement. As such this could result in greater GHG emissions - at least in the short term.

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
			Enhance long term economic prosperity and promote economic transformation	✓	There is a clear commitment to support the transformation of economic performance across the North and this includes the important economic centres and assets in both rural and urban areas.
			Coordinate land use and strategic transport planning across the region	✓	There is a clear commitment to alignment with and complementing the development and delivery of local transport, development and economic plans and policies.
			Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society *(EqIA specific objective)*	✓	While transforming economic performance should provide greater opportunity for all citizens (particularly when this transformation is aligned with local investment plans), there is a risk that the emphasis on maximising the benefits of agglomeration and focusing on areas where transformational economic growth is forecast will mean that benefits will not be experienced across the whole region. Nevertheless, it is noted that both rural and urban areas are anticipated to benefit and there is a commitment to align with and complement local transport, development and economic plans and policies. This suggests that local delivery will ensure that benefits are experienced across the North.
			Improve health and well-being for all citizens and reduce inequalities in health *(HIA specific objective)*	✓	While improved connections may improve safety and increase access to emergency health facilities, along with improved health by a provision of more jobs and increased wealth, there is a risk that the emphasis on maximising the benefits of agglomeration and focusing on areas where transformational economic growth is forecast will mean that benefits will not be experienced across the whole region. Nevertheless, it is noted that both rural and urban areas are anticipated to benefit and there is a commitment to align with and complement local transport, development and economic plans and policies. This suggests that local delivery will ensure that benefits are experienced across the North.
			Promote community safety and reduce crime and fear of crime for all citizens *(CSA specific objective)*	✓	While improved connections may improve safety and increase access to health facilities, there is a risk that the emphasis on maximising the benefits of agglomeration and focusing on areas where transformational economic growth is forecast will mean that benefits will not be experienced across the whole region. Nevertheless, it is noted that both rural and urban areas are anticipated to benefit and there is a commitment to align with and complement local transport, development and economic plans and policies. This suggests that local delivery will ensure that benefits are experienced across the North.

Table E-4 Updated STP Compatibility Assessment – STP Objective 2

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
2.	Promote and support the built and natural environment To ensure that transport interventions across the strategic transport system protect and enhance the natural and built environment, ensuring that the North's strategic transport system is as sustainable as possible. It covers a range of issues, including the need to provide sustainable travel choices for the movement of people and goods across the North; reducing emissions from transport; making best use of our existing transport infrastructure before investing in new capacity; and ensuring that new infrastructure is designed to minimise the negative impacts on both the natural and built environment.	The STP will: • Promote measures that improve sustainable travel options and make best use of the North's existing strategic transport networks • Promote and support the use of solutions that reduce emissions across the strategic road and rail networks • 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.	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	There is a clear recognition of the need to reduce emissions (which includes GHG emissions) from both road and rail in both the objective and the statement of what the plan will do. It is also clearly stated that environmental and sustainability impacts will be a key consideration in option selection for new strategic transport infrastructure interventions.
			Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	There is a clear recognition of the need to make best use of existing infrastructure and this would likely help reduce the need for new infrastructure - thereby protecting areas of biodiversity not previously impacted by transport schemes. There is also a clear commitment to minimise impacts on the natural environment and it is also clearly stated that environmental and sustainability impacts will be a key consideration in option selection for new strategic transport infrastructure interventions. This would include biodiversity considerations. In addition, the commitment to ensure that improvements to the strategic network align with local environmental objectives would ensure that important sites noted for biodiversity at the local level would be considered.
			Conserve and enhance the international sites (HRA specific objective)	✓	There is a clear recognition of the need to make best use of existing infrastructure and this would likely help reduce the need for new infrastructure - thereby protecting areas of biodiversity not previously impacted by transport schemes. There is also a clear commitment to minimise impacts on the natural environment and it is also clearly stated that environmental and sustainability impacts will be a key consideration in option selection for new strategic transport infrastructure interventions. It is assumed this would include biodiversity considerations. In addition, the commitment to ensure that improvements to the strategic network align with local environmental objectives would ensure that important sites noted for biodiversity at the local level would be considered - this would include any Natura 2000 sites.
			Protect and enhance air quality	✓	The clear commitment to reduce emissions from transport would likely result in the protection and enhancement of air quality. Making best use of existing infrastructure would also help to reduce negative air quality emissions through additional construction. It is also clearly stated that the STP will promote and support the use of solutions that reduce emissions across the strategic road and rail networks and the commitment to ensure environmental and sustainability impacts are considered in option selection would also include air quality considerations.
			Increase resilience of the transport network to extreme weather events and a changing climate	✓	The clear commitment that the STP will consider in option selection for new strategic transport infrastructure interventions environmental and sustainability impacts means it is assumed that the issue of extreme weather events and a changing climate would be addressed at that stage (no specific note is made).
			Protect and enhance the inland and coastal water environment	✓	It is noted that there is a clear commitment to protect and enhance the natural environment and it is assumed this would include the water environment (no specific mention is made). It is also assumed issues relating to the water environment would also be addressed at the options selection stage for new interventions.
			Protect and conserve soil and remediate / avoid land contamination	✓	It is noted that there is a clear commitment to protect and enhance the natural environment and it is assumed this would include the issue of soil (no specific mention is made). It is also assumed issues relating to the soil etc would also be addressed at the options selection stage for new interventions.

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
			Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	There is a clear recognition of the need to protect and enhance the built environment. There is also a commitment for the STP to 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. It is assumed this would include those distinctive historic industrial and cultural heritage assets (no specific mention is made).
			Protect and enhance the character and quality of landscapes and townscapes	✓	There is a clear recognition of the need to protect and enhance the built environment. There is also a commitment for the STP to 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. It is assumed this would include those distinctive landscapes and townscapes (no specific mention is made).
			Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	There is a clear commitment to make best use of existing infrastructure. This would likely result in the need for less new construction and therefore would lead to less waste and better use of existing resources. More efficiency in the network would also allow more prudent use of natural resources such as the reduction in use of hydrocarbons.
			Enhance lower carbon, affordable transport choice	✓	Measures that improve sustainable transport options would likely result in lower carbon options. There is also a clear commitment to reduce emissions.
			Enhance long term economic prosperity and promote economic transformation	✓	The focus of this STP Objective is on the Built and Natural Environment and measures derived from this could help with elements of economic prosperity such as tourism, agriculture, forestry etc.
			Coordinate land use and strategic transport planning across the region	✓	The commitment to ensure that improvements to the strategic transport network align with local environmental objectives will require the coordination of land use and strategic transport planning.
			Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society *(EqIA specific objective)*	**NR**	This Objective is focused on the built and natural environment and no relationship to this ISA Objective has been identified
			Improve health and well-being for all citizens and reduce inequalities in health *(HIA specific objective)*	✓	The STP Objective clearly notes the need to reduce emissions - this could result in an improvement in health. Commitments are also made to ensuring sustainability impacts are considered during option selection will include considerations of issues relating to equality, health and community safety.
			Promote community safety and reduce crime and fear of crime for all citizens *(CSA specific objective)*	**NR**	This Objective is focused on the built and natural environment and no relationship to this ISA objective has been identified

Table E-5 Updated STP Compatibility Assessment – STP Objective 3

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
3.	Improve opportunities across the north To ensure that the STP improves access to opportunities for all across the North. Ultimately transport is a means to an end. To ensure that economic growth in the North is as inclusive as possible, investment in the strategic transport network should enable better access to key opportunities, including employment, healthcare, social activities and education, for all, regardless of their age, income-level and mobility. This will require a carefully co-ordinated approach to ensure that strategic and local transport investment programmes and policies are aligned and complimentary.	The STP will: • Ensure that improvements to our strategic transport networks support the inclusive growth and provide affordable access to key opportunities across the North, aligning strategic proposals carefully with local aspirations.	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Protect and enhance biodiversity, geodiversity and the green infrastructure network	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Conserve and enhance the international sites (HRA specific objective)	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Protect and enhance air quality	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Increase resilience of the transport network to extreme weather events and a changing climate	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Protect and enhance the inland and coastal water environment	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Protect and conserve soil and remediate / avoid land contamination	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Protect and enhance the character and quality of landscapes and townscapes	**NR**	No relationship between this Plan Objective and ISA Objective has been identified.
			Promote the prudent use of natural resources, minimise		No relationship between this Plan Objective and ISA Objective has been identified.

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
			the production of waste and support re-use and recycling	NR	
			Enhance lower carbon, affordable transport choice	?	Compatibility is dependent upon the nature of the implementation method - it is noted that the text makes reference to affordable access, but there is no mention made of or information on enhancing lower carbon
			Enhance long term economic prosperity and promote economic transformation	✓	There is a clear commitment to supporting inclusive growth and access to opportunities across the North.
			Coordinate land use and strategic transport planning across the region	✓	There is a clear commitment to a careful coordinated approach to ensure that strategic and local transport investment programmes and policies are aligned and complimentary.
			Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society *(EqIA specific objective)*	✓	There is a clear commitment to ensure that the STP improves access to opportunities across the North. This includes enabling better access to employment, healthcare, social activities and education for all regardless of their age, income level and mobility. It is also noted that the STP will aim to provide affordable access which will enhance mobility of lower income groups.
			Improve health and well-being for all citizens and reduce inequalities in health *(HIA specific objective)*	✓	There is a clear commitment to ensure that the STP improves access to opportunities across the North. This includes enabling better access to employment, healthcare, social activities and education for all regardless of their age, income level and mobility. It is also noted that the STP will aim to provide affordable access which will enhance mobility of lower income groups.
			Promote community safety and reduce crime and fear of crime for all citizens *(CSA specific objective)*	✓	Better access to employment and facilities etc should help crime reduction in that it will assist in addressing deprivation, which has been shown to be linked to crime.

Table E-6 Updated STP Compatibility Assessment – STP Objective 4

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
4.	Increase efficiency, reliability and resilience on the transport system To improve the performance of the North's strategic transport network by making the case for interventions that improve its efficiency, reliability and resilience. This will ensure that the North's strategic transport networks meet the needs of its users, whether they are residents, businesses or visitors. The management of these networks will need to be able to adapt to changing demands over the period to 2050, such as shifting commuter patterns, changing leisure aspirations, more extreme weather conditions as a result of climate change and the emergence of new disruptive technologies, such as connected and autonomous vehicles. TfN will also identify opportunities to improve travel choices for the movement of both people and freight, to boost the resilience and sustainability of our pan-Northern networks, with a particular focus on making more sustainable travel options as attractive as possible. TfN will also promote measures that help to make the best of our existing networks, exploring new	The STP will: • Promote measures that will make the best use of the North's existing strategic transport networks and improve their performance, including through the use of best practice measures or new innovations; • Improve travel choices and user experience for the movement of people and goods across the North; and • Ensure that improvements to the performance of strategic transport networks are developed in a co-ordinated and integrated way with local networks.	Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	It is noted that there is an intention to increase the efficiency of the transport system along with technological advancements and it would be anticipated that this would lead to a decrease in GHGs. It is also noted that there is an emphasis placed on efforts to boost the sustainability of the Pan-Northern networks and on making more sustainable travel options. These measures will likely lead to less emissions of GHG.
			Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Better use of existing networks would likely result in less need for new infrastructure in areas of biodiversity not previously disturbed by transport infrastructure. There is also a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options. It is anticipated that this emphasis on sustainability would include the full range of sustainable issues, including biodiversity.
			Conserve and enhance the international sites (HRA specific objective)	✓	Better use of existing networks would likely result in less need for new infrastructure in areas of biodiversity not previously disturbed by transport infrastructure. There is also a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options. It is anticipated that this emphasis on sustainability would include the full range of sustainable issues, including biodiversity and thereby impacts on sites designated for nature conservation.
			Protect and enhance air quality	✓	It is noted that there is an intention to increase the efficiency of the transport system along with technological advancements and it would be anticipated that this would lead to an improvement in air quality. It is also noted that there is an emphasis placed on efforts to boost the sustainability of the Pan-Northern networks and on making more sustainable travel options. These measures should likely lead to improvements in air quality.
			Increase resilience of the transport network to extreme weather events and a changing climate	✓	This Plan Objective is specifically relating to the need to increase efficiency, reliability and resilience on the transport system. Extreme weather conditions are specifically noted in addition to other challenges.
			Protect and enhance the inland and coastal water environment	?	There is no specific mention in the text of the water environment etc. While there is a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options, we consider that 'Sustainable travel options relates to lower carbon and less pollution in terms of emissions, rather than these local issues.
			Protect and conserve soil and remediate / avoid land contamination	?	There is no specific mention in the text of conserving soil etc. While there is a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options, we consider that 'Sustainable travel options relates to lower carbon and less pollution in terms of emissions, rather than these local issues.
			Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial	?	There is no specific mention in the text of historic assets etc. While there is a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options, we consider that 'Sustainable travel options relates to lower carbon and less pollution in terms of emissions, rather than these local issues.

No.	STP Objective	What the Plan will do	ISA Objectives	Compatible?	Commentary
	technologies and demand management tools that help to maximise network efficiency.		and cultural heritage and their settings		
			Protect and enhance the character and quality of landscapes and townscapes	?	There is no specific mention in the text of landscapes etc. While there is a commitment to boost the sustainability of the Pan-Northern network, with a particular focus on making more sustainable travel options, we consider that 'Sustainable travel options relates to lower carbon and less pollution in terms of emissions, rather than these local issues.
			Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	There is clear commitment to making the best use of the North's existing strategic transport networks and improving their performance. This could result in less need for new infrastructure and likely less waste generation through construction activities. Better performance should also likely result in a decrease in the use of hydrocarbons.
			Enhance lower carbon, affordable transport choice	✓	There is an emphasis placed in this Plan Objective on making more sustainable travel options as attractive as possible and it is reasonable that this is likely to lead to lower carbon.
			Enhance long term economic prosperity and promote economic transformation	✓	An increase in the reliability and efficiency of the strategic transport network should enhance long term economic performance and help promote economic transformation.
			Coordinate land use and strategic transport planning across the region	✓	There is a clear commitment to ensuring that improvements to the performance of strategic transport networks are developed in a co-ordinated and integrated way with local networks.
			Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society *(EqIA specific objective)*	✓	It is noted in the Policy that there is a need to improve choice and ensure that the North's strategic transport networks meet the needs of its users, whether they are residents, visitors or businesses. This is taken to mean all citizens.
			Improve health and well-being for all citizens and reduce inequalities in health *(HIA specific objective)*	✓	It is anticipated that technological advances will lead to improvements in air quality and reduction in issues such as noise which should have a beneficial effect on health.
			Promote community safety and reduce crime and fear of crime for all citizens *(CSA specific objective)*	✓	In so far as technological changes may result in improved safety improved travel choice may help reduce crime, there is compatibility with this Objective.

Appendix F. Assessment of Strategic Alternatives

Table F-1 Assessment Tables Key

Terms		Effects					Assessment	
		Mag	Scale	Dur	T/P	Cert	Scale	Category
Mag	Magnitude	✓✓	Local	ST-MT	Temp	Low	**+++**	Large beneficial
Scale	Geographic Extent	✓	Local-Reg	ST-LT	Perm	Med	**++**	Moderate beneficial
Dur	Duration	-	Reg-Nat	MT-LT		High	**+**	Slight beneficial
T/P	Temporary / Permanent	?		ST			**0**	Neutral
Cert	Certainty	✗		MT			**-**	Slight adverse
ST	Short Term	✗✗		LT			**--**	Moderate adverse
MT	Medium Term						**---**	Strong adverse
LT	Long Term						**?**	Uncertain
Sm	Summary assessment						**+/-**	Combination of beneficial and adverse

F.1. Strategic Alternatives – Assumptions Used in Assessment

Table F-2 Strategic Alternatives – Assumptions Used in Assessment

Scenario Description	Assumptions
Scenario 1 – Compact and Digital	
• Urban areas are 'Compact', with brownfield development in the cores. • Local transport systems focus on serving radial movements. • Technological development has led to a preference for 'Digital' rather than physical connectivity. • Energy costs and therefore travel costs are high. • 192% Rail growth • 26% Road growth	• Compact urban cores lead to more emphasis on public transport in and between urban areas. • Higher energy costs have greater effect on road usage (lower) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport. • Emphasis placed on rail between urban areas – both new rail lines and widened rail corridors / line upgrades required. • New stations and improvements to stations required. • Multi-modal interchanges required. • Some new roads and widened road corridors / junction improvements. • Greater uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 2, leading to potentially more efficient road space use and less parking space. • Higher uptake of electric and hybrid road vehicles, compared to Scenario 2. • Opportunities for contamination remediation due to brownfield use. • Less overall land take due to more compact development. • Less greenfield land take. • Less need for motorised movement, and greater use of walking, cycling for shorter journeys. • More opportunities for co-location of housing and employment within compact urban areas. • Improved walking/cycling access to public transport, due to higher population within shorter distances to stations, hubs and stops. • More compact development generally higher density and more energy efficient (buildings as well as transport). • Greater digital connectivity reduces potential for road congestion in denser urban areas, as does greater walking/cycling.
Scenario 2 – Compact & Travel friendly	
• Urban areas are 'Compact', with brownfield development in the Cores • Local transport systems focus on serving radial movements	• Compact urban cores, together with greater 'travel friendly' connectivity, lead to more emphasis on public transport in and between urban areas. • Energy costs are low – therefore both road and rail are emphasised with new routes and route widening between urban areas.

Scenario Description	Assumptions
• Technological development has led to advances in 'Travel Friendly' connectivity options • Energy costs and therefore travel costs are low • 327% Rail growth • 52% Road growth	• Lower energy costs have greater effect on road usage (higher) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport, with new road routes and route widening between urban areas. • New stations and improvements to stations required (more than Scenario 1). • Multi-modal interchanges required (more than Scenario 1). • Lower uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 1, leading to potentially less efficient road space use and more parking space. • Lower uptake of electric and hybrid road vehicles, compared to Scenario 1. • Opportunities for contamination remediation due to more brownfield use. • Less overall land take due to more compact development, but greater than Scenario 1, due to greater transport facility provision. • Less greenfield land take, but likely greater than Scenario 1. • Less need for motorised movement, and greater use of walking, cycling for shorter journeys. • More opportunities for co-location of housing and employment within compact urban areas. • Improved walking/cycling access to public transport due to higher population within shorter distances to stations, hubs and stops, and greater public transport provision (compared to Scenario 1). • More compact development generally higher density and more energy efficient (buildings as well as transport). • Less digital connectivity and greater road usage may lead to greater potential for road congestion in denser urban areas.
Scenario 3 – Dispersed & Digital	
• Urban areas are 'Dispersed', with mixed greenfield and brownfield development in the suburbs and urban fringes • Local transport systems provide for all types of cross district movement • Technological development has led to preference for 'Digital' rather than physical connectivity • Energy costs and therefore travel costs are high • 60% Rail growth • 27% Road growth	• Greater emphasis on road improvement in urban areas due to dispersed nature of development and need to allow easy cross-district movement. • Higher energy costs have greater effect on road usage (lower) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport. • Greater uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 2, leading to potentially more efficient road space use and less parking space. • Higher uptake of electric and hybrid road vehicles, compared to Scenario 4. • Rail emphasised between urban areas with route upgrades required. Less requirement for new lines. • Lowest overall movement increase compared to all other scenarios likely to result in less overall land take. • More greenfield land take, compared to Scenarios 1 and 2.

Scenario Description	Assumptions
	• Fewer opportunities for contamination remediation due to less brownfield land take. • Fewer opportunities for non-motorised movement for short journey as development less compact and likely to be less co-location of housing and employment. • Less compact development generally lower density and less energy efficient (buildings as well as transport).
Scenario 4 – Dispersed & Travel Friendly	
• Urban areas are 'Dispersed' with mixed greenfield and brownfield development in the suburbs and urban fringes • Local transport systems provide for all types of cross-district movement • Technological development has led to advances in 'Travel Friendly' connectivity options • Energy costs and therefore travel costs are low • 136% Rail growth • 54% Road growth	• Greater emphasis on road improvement in urban areas due to dispersed nature of development and need to allow easy cross district movement, but all types of mode considered. • Lower energy costs have greater effect on road usage (higher) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport, with new road routes and route widening between urban areas. • Lower uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 3, leading to potentially less efficient road space use and more parking space. • Lower uptake of electric and hybrid road vehicles, compared to Scenario 3. • New rail lines and line upgrades required for inter-urban routes. • Multi-modal interchanges required. • Emphasis placed on full and continuous implementation of Smart • Higher land take compared to Scenario 3. Fewer opportunities for contamination remediation. • More overall land take compared to Scenario 3. • More greenfield land take, compared to Scenarios 1, 2 and 3. • Fewer opportunities for non-motorised movement for short journeys as development less compact. However, greater public transport connections may encourage more walking / cycling more (relative to Scenario 3). • Less compact development generally lower density and less energy efficient (buildings as well as transport).

F.2. Assessment of Strategic Alternatives – Business as Usual

Table F-3 Assessment of Strategic Alternatives – Business as Usual

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓/✗	Reg/ Nat	ST-LT	Perm	Med	--	+	++	+
Commentary **Short Term:** GHG emissions are high at present due to the relatively small number of LZEVs in the vehicle fleet (all modes of transport). This has a strong adverse effect on GHG emissions, but the trend is improving as more LZEVs come to market and uptake is growing alongside the development of the charging network. Effects are anticipated to be moderate adverse. **Medium Term:** There is significant potential for emissions reductions through continued improvement in fuel efficiency for conventional vehicles, switching to alternatively fuelled vehicles and from changing behaviour. This potential will be aided by schemes such as those to promote and support the use of LZEVs and as such, it is anticipated that the uptake of LZEVs will continue to grow. **Long Term:** Engine technology is increasing fuel efficiency and there is a gradual roll out of LZEV charging points, with fresh government initiatives in this area for example through a refresh of the 'Plug In Vehicle Infrastructure strategy'. This will help make LZEV a more attractive vehicle option and may lead to reductions in GHG in the mid to long term. It is the UK Government aim for almost every car and van to be zero emission by 2050. This would represent a moderate beneficial effect, though there could potentially still be considerable emissions from other vehicle types such as HGVs. Overall it is considered that effects will be **slight beneficial** in relation to this ISA Objective.									
Mitigation **Mitigation Measures:** See Mitigation Table 1.									
ISA Objective	**Effects**					**Assessment**			
	Mag	**Scale**	**Dur**	**T/P**	**Cert**	**ST**	**MT**	**LT**	**Sm**
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+	+	+
Commentary **Short Term:** Constant pressures from development (direct and indirect), climate change, invasive alien species and inappropriate management practices have the potential to adversely affect the integrity of local, national and international (European) designated sites, and the status and distribution of priority habitats and species. However, there are opportunities through development to protect and enhance biodiversity through improving green infrastructure. One such example to aid certain species is the National Pollinator Strategy, produced by Defra to support bees and other pollinators. A number of organisations have signed up to the strategy, including Network Rail and Highways England. It is considered that there would be a mix of beneficial and adverse effects. **Medium Term**: In the UK, there is a statutory basis for planning to seek to minimise impacts on biodiversity and provide net gains in biodiversity where possible through Section 40 of the Natural Environment and Rural Communities Act 2006 and there are commitments at European level to halt the loss of biodiversity. It is anticipated this will result in slight beneficial effects.									

Long Term: Statutory duties concerning planning policy and existing commitments to no net loss of biodiversity within the transport infrastructure sector have the potential to improve the state of the natural environment within the UK. In addition to the ongoing commitments to no net loss by bodies such as Highways England, the Green Infrastructure Strategy proposed by the European Commission aims to promote the development of Green Infrastructure within the transport sector, by reducing the carbon footprint of transport, mitigate the negative effects of land uptake and fragmentation, and boost opportunities to better integrate land use, ecosystem and biodiversity concerns into policy and planning. It is anticipated these will have slight beneficial effects.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: There are a large number of sites designated for their importance for nature conservation across the STP area, with the north of England having 463 SACs, 241SPAs, 11 Ramsar sites and 1131 SSSIs. All these sites are afforded high levels of protection under international and national legislation, and it is anticipated that the number of designated sites will increase over the Plan period. The Natural England condition summary for SSSIs (including units that cover SPAs, SACs and Ramsar sites) shows that 94.22% of these sites in the North East are at favourable or unfavourable but recovering status. However, it should be noted that these sites are subject to pressures from development (direct and indirect impacts). increasing levels of transport movements could increase levels of disturbance – many of the existing designated areas are in proximity to transport infrastructure. As such it is anticipated effects on designated sites can be considered uncertain.

Medium Term: It is expected that new interventions may have the potential to negatively affect international designated sites. However, the high level of protection afforded to international designated sites necessitates the undertaking of formal assessment for any plan or project where this risk is encountered and appropriate levels of mitigation / compensation provided. As such, effects are considered uncertain.

Long Term: It is considered that application of HRA will highlight any potentially adverse impacts on international designated sites arising from new or improved transport interventions. The HRA methodology focuses on the principles of the mitigation hierarchy, as outlined in Environmental Impact Assessment, which firstly aims to avoid, then minimise/reduce any negative effects on designated sites. If any adverse impacts cannot be adequately mitigated for, then compensatory measures would be required.

Overall, effects are anticipated to be **uncertain** for this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓✓/ ✗	Local	ST-LT	Perm	Med	-	+	+++	++

Commentary

Short Term: There have been significant improvements in air quality across the UK in recent years, but local hotspots remain where National Air Quality Standards are exceeded, particularly in urban areas and along roads. Local authorities across the North have designated over 133 AQMAs aimed at addressing these local issues.

Medium Term: It is expected that local instances of poor air quality will become more severe. Congested and slow moving traffic will be experienced more frequently resulting in higher levels of vehicle emissions localised concentrations and potential issues with local air quality, especially when including the likely diversion of traffic due to congestion onto less appropriate roads with adjacent housing. To address this, the UK has adopted ambitious, legally-binding targets to reduce significantly emissions of NO_x and four other damaging air pollutants for 2020 and 2030. It is also the case that it is anticipated that there will be an uptake in LZEVs, which will help to improve air quality. It is anticipated effects will be slight beneficial.

Long Term: It is anticipated that there will be further uptake of LZEVs and it is the UK Government's aim for almost every car and van to be zero emission by 2050. This will have a strong beneficial effect on air quality.

Overall, effects are anticipated to be **moderate beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✘	Reg-Nat	ST-LT	Perm	Med	-	--	--	--

Commentary

Short Term: The climate of the UK is already changing and risk assessments have shown that areas across the north of England are already impacted by extreme weather events, flooding and heat waves which seriously damage property and threaten lives. Measures are being taken at present to address many of the issues raised by a changing climate. For example, local authorities are encouraged under the National Planning Policy Framework to mitigate and adapt to climate change. Effects are anticipated to be slight adverse.

Medium Term: While measures to adapt to a changing climate will continue to be introduced, the UK's climate is expected to continue to change and this is likely to be manifested particularly through changes in weather patterns and increased frequency and intensity of storms. For example, the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. Implementation of SuDs under the WFD should help reduce some negative effects. Uptake of LZEVs and smart mobility technology may reduce resilience due to more reliance on the electrical network. Effects are anticipated to be moderate adverse.

Long Term: By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. Implementation of SuDs under the WFD should help reduce some negative effects. Uptake of LZEVs and smart mobility technology may reduce resilience due to more reliance on the electrical network. Effects are anticipated to be moderate adverse.

Overall, effects are anticipated to be **moderate adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: Water quality has been impacted severely across the north of England, often by transport activities. Currently across England 17% of surface water bodies are at good or better ecological status or potential, with 53% of groundwater bodies at good chemical status (69% at good quantitative status). Effects are anticipated to be moderate adverse.

Medium Term: Specific measures are being introduced under the WFD to address water pollution from the transport network, in particular from roads. The use of SuDS is also becoming a more common / standard element to road drainage design. The WFD anticipates that measures such as these will help improve water quality status in future. By 2021 6.3% of surface water bodies in England are expected to improve by at least one ecological status class, but effects would still be anticipated to be adverse.

Long Term: Continued measures under the WFD are likely to continue to improve water quality. Increased usage of LZEVs could also lead to an improvement in water quality as it should lead to reductions in hydrocarbons from road network runoff. This improvement would be most particularly noted in the event of an accident, where the rupturing of fuel tanks would not be an issue. There may still be issues from road runoff (tyre degradation, etc.). Effects are anticipated to be slight adverse.

Overall, effects are anticipated to be **slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓/✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: There is a range of Agricultural Land Classifications across the north of England, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a). Estimates are that Grades 1 and 2 together form about 21% of all farmland in England, with sub-group 3a also covering about 21%. The industrial legacy of the North of England means that there are large areas of contaminated land, particularly in urban areas. Further contamination of soil resources could occur due to deposition of pollution via air or water or through spillage of contaminants, though there are also opportunities for remediation. Effects are anticipated to be a mix of adverse and beneficial.

Medium Term: There would likely be continued loss of areas of soil due to transport schemes and ongoing contamination could continue from transport projects, though the anticipated uptake of LZEVs and smart mobility technology would reduce this potential, and there would be opportunities for land remediation. Effects are anticipated to be mix of adverse and beneficial.

Long Term: LZEV uptake will likely gather pace, but there would be continued loss of areas of soil due to transport schemes and ongoing contamination could continue from transport projects, although there would still though be opportunities for remediation. Effects are anticipated to continue as a mix of adverse and beneficial.

Overall, effects are anticipated to be a mix of **slight beneficial and slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Med	+/-	+	+	+

Commentary

Short Term: The North of England has a wealth of historic, industrial and cultural heritage assets. Prime amongst these are the World Heritage Sites, which are strongly protected. While these assets could be affected by transport interventions, 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. Opportunities could also be provided to enhance sites. It is anticipated there would be a mix of beneficial and adverse effects.

Medium Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. This is anticipated to result in slight beneficial effects.

Long Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. This is anticipated to continue to result in slight beneficial effects.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local-Reg	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Landscapes and townscapes vary across the north of England. Though the dominant land use is rural, there are major urban conurbations, along with the full range of settlement types. Many of these areas are protected in the form of National Parks and AONBs. However, there are areas where landscape and / or townscape is being diminished. These areas are frequently adjacent to transport routes and it is expected that this will continue. New interventions would also introduce new features into the landscape, though they may also in some instances provide an opportunity to improve landscape and or townscape. Effects are anticipated to be slight adverse.

Medium Term: Those areas currently protected for their landscape will still receive that protection. Other areas may deteriorate due to increased urbanisation or along major transport corridors. Effects are anticipated to be slight adverse.

Long Term: Those areas currently protected for their landscape will still receive that protection. Other areas may deteriorate due to increased urbanisation or along major transport corridors. Effects are anticipated to be slight adverse.

Overall, effects are anticipated to be **slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local	ST-LT	Perm	Med	-	+	+	+

Commentary

Short Term: By its nature, transport involves the use of natural resources through fuel / energy use or the use of extractive resources such as aggregates or hydrocarbons for construction purposes. While modern construction practices encourage the use of recycled materials, this does not account for the full requirement of materials. Anticipated increased rates of travel will also lead to increased energy requirements. Effects are anticipated to be slight adverse.

Medium Term: It is anticipated that there would be further use of materials and waste generated as interventions are developed to meet the anticipated increases in travel demand / opportunities which would also continue to require more energy use. Measures introduced under the EU Waste Framework Directive, and increasing landfill tax, are likely to benefit this ISA Objective. Effects are anticipated as slight beneficial.

Long Term: While in the longer term, most interventions will have already been constructed, there would still remain an ongoing requirement for energy (even with increased uptake of LZEVs and greater engine efficiency) and material use in maintenance. Measures introduced under the EU Waste Framework Directive, and increasing landfill tax, are likely to benefit this ISA Objective. Effects are anticipated to remain slight beneficial.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✗	Reg-Nat	ST-LT	Perm	Med	--	-	+/-	-

Commentary

Short Term: At present the vast majority of transport modes in the UK are traditionally fuelled by hydrocarbons. Affordability is also a significant issue in terms of petrol cost and rail fares. Government is working to reduce emissions by promoting public transport choices, supporting the market for innovative forms of transport and encouraging a move to cleaner and lower carbon vehicles. This is beginning to result in an increasing uptake of LZEVs, though in terms of the overall fleet, numbers are still very low. Electrification of the rail network is underway and despite significant progress, this will be a long process and subject to continued high levels of investment. Effects are considered moderate adverse.

Medium Term: Due to predicted baseline trends in the growth of LZEV usage, it is anticipated that low carbon choice will be more widely available. However, it is likely that there will still be issues relating to affordability. Effects are anticipated to be slight adverse.

Long Term: By 2050, it is predicted in baseline trends that almost every car and van will need to be zero emission. Affordability issues associated with LZEVs may potentially lessen as technology matures. Effects are anticipated to be a mix of slight adverse and slight beneficial.

Overall, effects are anticipated to be **slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Currently the population of the North is 15.8 million, of whom 7.5 million are in employment, and the economy generates GVA of £317 billion. Tax receipts for the North of England are approximately £115 billion. There remain persistent differences in GVA in the North compared to the rest of England, with the North consistently around 25% below average for the rest of England. There is a typical gap in income per person of £4,600 between the North and the UK average.

Medium Term: Population, employment and GVA are anticipated to grow under the Business as Usual scenario with tax receipts of approximately £200 billion in the North of England. While there will be growth, it is anticipated that closing the economic gap with the rest of England will not happen under the Business as Usual scenario.

Long Term: Under the Business as Usual scenario, population is anticipated to grow to 18.1 million, employment to 8.3 million and GVA to £603 million by 2050, with tax receipts of approximately £200 billion in the North of England.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✗	Reg-Nat	ST-LT	Perm	High	-	-	-	-

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level.

Medium Term: It is anticipated that current arrangements for land use and strategic transport planning will continue.

Long Term: It is anticipated that current arrangements for land use and strategic transport planning will continue.

Overall, effects are anticipated to be **slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Temp	Low	+	+	+	+

Commentary

Short Term: In the planning stages and fundamental to any schemes, there is increased focus on inclusivity and accessibility.

Medium Term: Increased levels of investment and an increased focus on communities provides benefits through improved access to employment and other community services. Services should be designed so that they are fully inclusive.

Long Term: Affordability of transport will remain an issue for those in income deprived areas, however, providing new transport services will enhance accessibility for all groups, as long as they a price accordingly.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Temp	Low	+	+	+	+

Commentary

Short Term: There is an increased national focus on health and wellbeing, which will bring about benefits., however, inequalities in health do still exits. Improvements in transport services, can improve accessibility to health series, employment and community facilities. The government have designated over 133 AQMAs identifying poor air quality in the STP area.

Medium Term: Air quality in local areas will become more severe as they as a result of increased road traffic. However, enhanced services will lead to improvements in accessibility to employment locations, community facilities and health facilities and consequently improvements to the health and wellbeing of citizens.

Long Term: Increasing focus on health and wellbeing across infrastructure and transport will provide benefits to health and wellbeing of communities through improved amenities and access to these amenities.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✗	Local-Reg	MT-LT	Temp	Low	-	-	-	-

Commentary

Short Term: Transport interventions include safety as a primary objective. However, crime levels are rising across the area.

Medium Term: Increasing the focus on community safety, will provide some safety benefits, however, crime levels are likely to remain high in cities.

Long Term: Continued focus on community safety and reducing crime is likely to have some benefits, although crime will still be high in cities. New infrastructure which provides a welcoming atmosphere, through safety and security issues will help this.

Overall, effects are anticipated to be **slight adverse** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There is increased focus on inclusivity and accessibility in transport and infrastructure. Increasing availability of / access to inclusive transport options will have positive impacts on equality of opportunity for all citizens.

Medium Term: Increased levels of investment and focus on communities will provide benefits to equality of opportunity through improved access to employment and other community services. Services to be designed so that they are fully inclusive to maximise benefits to citizens.

Long Term: Provision of new transport services and further enhancements to existing services will further enhance accessibility for all groups, provided they are fully inclusive and priced accordingly.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: All enhancements and new services/infrastructure should be assessed to ensure inclusivity for all citizens.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Affordability of transport is an issue for those with lower incomes and this affects equality of opportunity. In the short term some enhancements can be made to public transport services to improve affordability, and enhance accessibility to a range of services, however inequalities will still exist.

Medium Term: Any enhancements in inclusivity and accessibility are likely to have beneficial effects on affordability through providing a wider range of transport options for journeys. However, any direct effects on affordability can only be determined with a specific price structure. Furthermore, any changes to highways which could increase or reduce vehicle operating costs in the medium term could have an effect on affordability.

Long Term: Any enhancements in the fare structure, simplifying or integrating travel and ticketing could have beneficial effects on affordability. This is also true with any highway enhancements which alter vehicle operating costs and conversion to zero emission vehicles. This is especially important for those in lower income groups.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Affordability should be a central consideration to any new or enhanced transport services/facilities. Ensuring pricing structures should be used, and any opportunities to provide benefits to those on low incomes should be maximised,

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT -LT	Perm	Low	+	+	+	+

Commentary

Short Term: Any modernisation or enhancements of interchanges and waiting facilities will improve fear of crime and promote community safety through embedded safety measures.

Medium Term: As with the short term, improvements to infrastructure and facilities/services seek to improve formal and informal safety measures (i.e. surveillance, lighting, CCTV etc.) and therefore will have positive effects on community safety.

Long Term: As with the medium term, there could be long term effects on feelings of crime and community safety with enhancements to infrastructure, facilities and services. interchanges.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety and perception of safety should be a central consideration in all schemes. Research with more vulnerable groups in terms of actual or perceived safety should be undertaken to identify suitable safety measures to maximise impact on this sub objective (i.e. those that might have a higher fear of potential crimes - children, older people, or those are more susceptible to hate crimes – BAME, disabled, LGBT groups).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/ ✗	Local-Reg	MT -LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Highway improvements will help to enhance road safety and reduce the number of accidents, although the demand for car travel is still predicted to increase in some areas, which may have a negative impact on road safety. Any increases in the attractiveness of public transport could have a positive impact on rod safety due to people choosing public transport over car journeys.

Medium Term: Mixed benefits likely. There are likely to be more road improvements in urban areas resulting in more improved road safety. However, any road improvements which increase traffic in urban areas could increase accidents and incidents in the local area. Any improvements to public transport which create a mode shift from car could also lead to improvements in safety.

Long Term: As with the medium term, highway or public transport improvements will have mixed effects dependent on the location and attractiveness of the option.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/ ✗	Local-Reg	MT -LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Mixed effects likely. Public transport enhancements could create mode shift from private vehicles in urban areas, which are likely to have a positive effect on severance, as this has the potential to reduce the number of cars in densely populated areas, however indirect impacts may occur. Additionally, highway improvements may improve routes and lessen congestion in some areas, but have distributional effects elsewhere.

Medium Term: Any highway or public transport enhancements that have a localised increase in perceived severance will need to be mitigated against. Any infrastructure which creates a mode shift will have beneficial impacts on severance in specific road corridors.

Long Term: Any highway or public transport enhancements that have a localised increase in perceived severance will need to be mitigated against. Any infrastructure which creates a mode shift will have beneficial impacts on severance in specific road corridors.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Severance should be carefully considered through understanding the community surrounding new transport schemes and consulting with them as necessary to minimise negative impacts / increasing severance and maximising positive outcomes.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓/ ✗	Local-Reg	MT -LT	Perm	Low	-	+/-	+/-	+/-

Commentary

Short Term: There are an increasing number of cars on the road and air quality levels are currently increasing in certain areas.

Medium Term: Promoting low and zero emission vehicles can have positive benefits on air quality. Furthermore, enhancements in public transport that reduce the traffic through densely urban areas can reduce air and noise pollution in those areas.

Long Term: Dependent on the specific infrastructure implemented mixed benefits will be likely. A shift to zero emission vehicles will help reduce negative effects on air and noise pollution in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Environmental impacts of proposed measures and infrastructure should be assessed, specifically in relation to children those at home during the day (i.e. carers, elderly, shift workers).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: There is an increased national focus on health and wellbeing, which will bring about some general benefits, however, inequalities in health will still exist. Improvements in transport services, can improve accessibility to health series, employment and community facilities provided they are fully inclusive.

Medium Term: Enhanced services will lead to improvements in accessibility to employment locations, community facilities and health facilities and consequently improvements to the health and wellbeing of citizens.

Long Term: Increasing focus on health and wellbeing across infrastructure and transport will provide benefits to health and wellbeing of communities through improved amenities and access to these amenities.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Improvements in transport services, can improve accessibility to health series, employment and community facilities when priced accessibly.

Medium Term: Enhancements to transport infrastructure and services are likely to improve accessibility to an affordable range of transport options, subsequently resulting in improving access to services/facilities that will impact on health and wellbeing.

Long Term: Increasing focus on health and wellbeing across infrastructure and transport will provide benefits to health and wellbeing of communities through improved amenities and access to these amenities.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low-income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT -LT	Perm	Med	+	+	+	+

Commentary

Short Term: Improvements/enhancements to new infrastructure can bring about improvements to community safety and reduction in fear of crime when thoroughly considered with safety measures embedded in design.

Medium Term: Further enhancements to transport infrastructure and services can have positive beneficial effects on fear of potential crime.

Long Term: As with the medium term, improvements to transport infrastructure and services have beneficial impacts on community safety in long term when safety measures and considerations are embedded in the design.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/ ✗	Local-Reg	MT -LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any focus on highway improvements, or provision of alternative options to create mode shift will have beneficial effects on safety and incidents. However negative effects may be experienced through enhancing attractiveness of highway routes, and distributional impacts of changes to vehicle flow on local roads.

Medium Term: Medium term effects will vary dependent on the infrastructure implemented.

Long Term: Long term effects will vary dependent on the enhancements to services and infrastructure.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: A full assessment of the likely effects of any enhancements to highway routes / services / infrastructure will identify the likely direct and distributional impacts on road safety.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/ ✗	Local-Reg	MT -LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any focus on infrastructure and service improvements can have beneficial or negative effects on severance dependent on the type and extent of enhancements. Distributional effects on severance can also differ to direct benefits of the infrastructure developed.

Medium Term: Medium term effects will vary dependent on the infrastructure implemented.

Long Term: Long term effects can occur dependent on the increased infrastructure and whether this is road or public transport.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: A full assessment of the likely effects of any enhancements to highway routes / services / infrastructure will identify the likely direct and distributional impacts on severance. Large road enhancements which will attract a significant increase in vehicles and HGV traffic through densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or appropriately mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✗	Local-Reg	MT -LT	Perm	Med	-	-	-	-

Commentary

Short Term: The government have designated over 133 AQMAs identifying poor air quality in the STP area. Measures to reduce congestion and encourage mode shift will have beneficial impacts on overall environment and pollutants.

Medium Term: Air quality in local areas will become more severe as a result of increased road traffic. Measures to reduce congestion and create mode shift will have some positive impact on air quality and noise, which may make some improvements to health and wellbeing of citizens.

Long Term: Air quality may become increasingly severe as traffic and HGV content becomes increasingly greater on the road corridors. National targets to create a zero emission vehicle fleet in the long term will have positive impacts on the environment and subsequently health and wellbeing.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements to transport infrastructure/services which reduce environmental impacts would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore,

people which long term conditions, such as asthma will be particularly vulnerable to areas increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport and zero emission vehicles.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓/ ✗	Local -Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: More efficient use of road space should help to improve road safety and reduce the number of accidents, although the demand for car travel is still predicted to increase in some areas, which may have a negative impact on road safety. Any increases in the attractiveness of public transport could have a positive impact on rod safety due to people choosing public transport over car journeys.

Medium Term: There are likely to be highway improvements in urban areas resulting in more improved road safety. However, any highway improvements which increase traffic in urban areas could increase accidents and incidents in the local area. Any improvements to public transport which create a mode shift from car could lead to improvements in safety.

Long Term: As with the medium term, any road or public transport improvements can have mixed effects dependent on the location and attractiveness of the option.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Any modernisation or enhancements of interchanges and waiting facilities can improve fear of crime and promote community safety through embedded safety measures.

Medium Term: As with the short term, improvements to infrastructure and facilities/services seek to improve formal and informal safety measures (i.e. surveillance, lighting, CCTV etc.) and therefore will have positive effects on community safety.

Long Term: As with the medium term, there could be long term effects on crime and community safety with enhancements to highways and transport facilities and services.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Safety and perception of safety should be a central consideration in all schemes. Research with more vulnerable groups in terms of actual or perceived safety should be undertaken to identify suitable safety measures to maximise impact on this sub objective (i.e. pedestrians, cyclists)

F.3. Assessment of Strategic Alternatives – Transformational Scenario 1

Table F-4 Transformational Scenario 1 – Description and Key Assumptions

Scenario 1: Compact & Digital
• Urban areas are 'Compact', with brownfield development in the cores • Local transport systems focus on serving radial movements • Technological development has led to a preference for 'Digital' rather than physical connectivity • Energy Costs and therefore travel costs are high • Rail anticipated to grow 192% • Road anticipated to grow 26%
Key Assumptions • Compact urban cores lead to more emphasis on public transport in and between urban areas. • Higher energy costs have greater effect on road usage (lower) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport. • Emphasis placed on rail between urban areas – both new rail lines and widened rail corridors / line upgrades required. • New stations and improvements to stations required. • Multi-modal interchanges required. • Some new roads and widened road corridors / junction improvements. • Greater uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 2, leading to potentially more efficient road space use and less parking space. • Higher uptake of low/zero emission vehicles (LZEVs), compared to Scenario 2. • Opportunities for contamination remediation due to brownfield use. • Less overall land take due to more compact development. • Less greenfield land take. • Less need for motorised movement, and greater use of walking, cycling for shorter journeys. • More opportunities for co-location of housing and employment within compact urban areas. • Improved walking/cycling access to public transport, due to higher population within shorter distances to stations, hubs and stops. • More compact development generally higher density and more energy efficient (buildings as well as transport). • Greater digital connectivity reduces potential for road congestion in denser urban areas, as does greater walking/cycling.

Table F-5 Assessment of Strategic Alternatives – Transformational Scenario 1

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg/ Nat	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Compact urban cores are anticipated to lead to more emphasis on public transport in and between urban areas. Although there would be some new road and junction improvements, there would be an emphasis placed on rail between urban centres. The compact urban areas would also likely result in greater opportunities for walking / cycling. It is anticipated that these measures, along with higher energy costs, will result in an increase in the use of public transport and less road use than would be expected under other scenarios (26% increase anticipated under this scenario). GHG emissions from road transport would also be reduced by a higher uptake of electric and hybrid vehicles. Increased digital connectivity should also help to minimise journeys. These elements would be supported by measures outlined in the STP and it is anticipated to result in slight beneficial effects.

Medium Term: A continued emphasis on public transport in and between urban areas, an increase in the uptake of LZEVs and continued implementation of smart mobility technology are anticipated to result in moderate beneficial effects in terms of GHG emissions.

Long Term: Increasing concentration of development in urban cores, along with increasing uptake of LZEV and the continued emphasis on public transport in these areas should result in moderate beneficial effects in terms of GHG emissions.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects for this ISA Objective from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, compact urban cores will reduce the need for greenfield land take and the use of brownfield areas will provide opportunities to enhance habitat. The aim of the STP to support a net gain in biodiversity is likely to be easier to achieve under this scenario. It is anticipated that effects will be slight beneficial.

Medium Term: Slight beneficial effects are anticipated to continue through the clear goal to support a net gain in biodiversity.

Long Term: Slight beneficial effects are anticipated to continue, through the clear goal to support a net gain in biodiversity.

Overall, it is anticipated that effects will be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Reg/ Nat	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: Under this scenario urban areas are more likely to be compact and there is likely to be less road growth than under other scenarios. It is also the case that for the most part, sites designated for nature conservation at the international level are outside urban areas. However, there is still a potential for effects on these areas under this scenario. As less road infrastructure is anticipated under this scenario, it is likely that the potential risk of negative effects would be lower, compared to Scenario 1. However, the scenario provides insufficient detail to enable these effects to be meaningfully estimated and, while the STP notes specific measures to protect HRA relevant sites, potential effects are considered uncertain.

Medium Term: Effects will remain uncertain and are dependent upon the nature and location of interventions.

Long Term: Effects will remain uncertain and are dependent upon the nature and location of interventions.

As such it is considered that this Strategic Alternative would have **uncertain** effects on International Sites.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also Habitats Regulation Assessment process to be followed in relation to the development of interventions as statutorily required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Compact urban cores are anticipated to lead to more emphasis on public transport in and between urban areas. Although there would be some new road and junction improvements, there would be an emphasis placed on rail between urban centres. The compact urban areas would also likely result in greater opportunities for walking / cycling. It is anticipated that these measures, along with higher energy costs, will result in an increase in the use of public transport and less road use than would be expected under other scenarios (26% increase anticipated under this scenario). Air pollutant emissions from road transport would also be reduced by a higher uptake of LZEV. Increased digital connectivity will also help to minimise journeys, with a positive effect on air quality. These elements would be supported by measures outlined in the STP and it is anticipated to result in slight beneficial effects.

Medium Term: A continued emphasis on public transport in and between urban areas, an increase in the uptake of LZEVs and continued implementation of smart mobility technology are anticipated to result in moderate beneficial effects in terms of air quality.

Long Term: Increasing concentration of development in urban cores, along with increasing uptake of LZEVs and the continued emphasis on public transport in these areas will result in moderate beneficial effects in terms of air quality.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local	ST-LT	Perm	Med	++	+	+	+

Commentary

Short Term: Greater resilience to extreme weather events and a changing climate will be promoted and supported by strategic components within the STP, e.g. increased use of SuDS. Under this scenario, it is anticipated that more compact urban cores will allow less need for motorised movement and a greater use of walking / cycling for shorter journeys, with potentially less disruption by extreme weather events. The reduced need for greenfield land take could also help to reduce changes to drainage patterns and increased runoff from urban areas, thereby helping to reduce the risk of flooding. This scenario would also see greater digital connectivity which would allow interaction among people to continue without the need for physical connectivity and therefore would not be as susceptible to disruption from extreme weather. Greater uptake of LVEVs and smart mobility technology may lead to a reduction in resilience due to increased reliance on electricity network.

Medium Term: It is anticipated that under this scenario, trends toward more compact urban cores and greater digital connectivity would increase and would allow greater resilience to extreme weather events as outlined in the short term.

Long Term: While it is considered extreme weather events are likely to increase in frequency and intensity, it is anticipated that under this scenario trends toward more compact urban cores and increased digital connectivity would increase and would allow greater resilience to extreme weather events as outlined in the short term.

Overall, it is anticipated that under this scenario there would be **minor beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local	ST-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Protection of the water environment will be aided by the introduction of measures in the STP such as the increased use of SuDS. In this scenario, urban cores will be more compact, with an anticipated reduction in greenfield land take, compared to other scenarios. This should help to reduce levels of polluted urban runoff. Greater digital connectivity would reduce potential for road congestion, with an associated potential reduction in accidents. This could help to reduce pollution events. Reduction in potential accidental release of hydrocarbons would also be aided by the anticipated higher uptake of LZEVs.

Medium Term: It is anticipated that the uptake of LZEVs would increase, along with smart mobility and enhanced digital connectivity. These trends would help to protect the water environment. The emphasis placed on rail between urban areas would also reduce the likelihood of polluted road runoff.

Long Term: It is anticipated that trends in increased LZEV would increase further, along smart mobility with digital connectivity, with resulting protection of the water environment. The use of SuDS on new transport interventions would also have increased.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local-Reg	ST-LT	Perm	Med	++	+	+	+

Commentary

Short Term: This scenario is anticipated to provide opportunities for contamination remediation due to the emphasis on brownfield development. Soil would also be protected from disturbance / contamination by the anticipated lower overall greenfield land take due to more compact development. There would still be a need for new / enhanced rail lines, as well as some new / enhanced roads between urban areas, and this could lead to soil disturbance / loss and the potential for contamination. Overall, however, it is considered that there would be slight beneficial effects from implementation of the STP under this scenario.

Medium Term: It is considered that the emphasis on brownfield areas would continue to provide opportunities for remediation of contaminated land. These benefits would outweigh the potential for disturbance to soil from interventions as measures would be taken under the STP to protect high value land and soils. Slight beneficial effects are therefore anticipated to continue.

Long Term: The benefits of utilising (and remediating) brownfield land and less need for greenfield development would continue.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	++	+	+	+

Commentary

Short Term: Compact urban cores could lead to increased pressure on historic assets in these areas, but less greenfield land take may offer protection to historic / cultural features. Opportunities for enhancing historic assets could be provided, e.g. through the need to improve historic stations, and this would be encouraged through the strategic components outlined in the STP. These components include protection and enhancement for historic assets and archaeological investigation to be undertaken and this would increase understanding of our cultural heritage. Overall, it is anticipated that slight beneficial effects on cultural heritage would be experienced under this scenario.

Medium Term: Protection of historic assets would continue, along with opportunities to enhance historic assets taken. This is anticipated to continue to result in slight beneficial effects.

Long Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. This is anticipated to continue to result in slight beneficial effects.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Under this scenario, urban cores are anticipated to be more compact. This will result in less greenfield land take and therefore will help to protect landscapes. Townscapes could be changed under this scenario, but the STP would offer opportunities for enhancement in some areas, e.g. improvements to stations, or through an uptake in digital connectivity and smart mobility leading to a reduction in the need for car parking. This would also be enhanced through more emphasis on public transport and improved walking / cycling connections, which would also likely lead to a reduction in congestion in town centres, thereby helping to improve townscapes. This would be enhanced by an uptake in LVEVs which would help reduce noise and pollution in towns. Overall, this is anticipated to result in slight beneficial effects under this scenario.

Medium Term: It is anticipated that beneficial effects would continue and may increase as digital connectivity and smart mobility grows, alongside increasing development within urban centres and a general increase in usage of public transport.

Long Term: Slight beneficial effects are anticipated to continue as development becomes more focused on urban centres, and smart mobility and digital connectivity expands.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Greater concentration of development in urban centres is anticipated to lead to a general higher density and more energy efficiency (buildings as well as transport) which will manifest in a more prudent use of natural resources (energy, materials, water). Reduction in fuel usage also expected due to higher energy costs and greater use of digital connectivity, smart mobility and walking / cycling, as well as an emphasis on public transport and an overall lower need for motorised transport, relative to other scenarios. While there will be some new roads and widened road corridors, it is anticipated that the emphasis will be on rail between urban areas and this would also lead to a reduction in energy use per travel kilometre. Rail construction also typically uses less material per kilometre than road construction.

Medium Term: It is anticipated that there will be a developing uptake of LVEVs, leading to further reductions in fossil fuel use. Development will be increasingly concentrated in urban centres and this will mean there is less greenfield development, which should reduce the generation of waste. It is anticipated that effects would be moderate beneficial.

Long Term: Development will continue to be concentrated in urban centres, and LVEVs, smart mobility and digital connectivity will continue to grow. There will continue to be less greenfield loss, with a consequent reduction in waste. It is anticipated that effects would continue to be moderate beneficial.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓	Reg-Nat	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Development of compact urban areas is anticipated to lead to more emphasis on public transport in and between urban areas. Although there would be some new road and junction improvements, there would be an emphasis placed on rail links between urban centres. The compact urban areas would also likely result in greater opportunities for walking / cycling. It is anticipated that with the emphasis in the STP on affordability through use of smart technology, etc. which could encourage the increased use of public transport, these developments would result in an enhancement in lower carbon, affordable transport choice and it is considered that effects would be slight beneficial.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology are anticipated to result in moderate beneficial effects.

Long Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas should continue to result in moderate beneficial effects.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓	Reg-Nat	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: Development of compact urban areas is anticipated to lead to more opportunities for co-location of housing and employment. There will also be higher population levels within a shorter distance of main economic / business areas. With a greater use of digital connectivity and other measures to improve the use of public transport reducing congestion, it could potentially be easier for people to access town centres and their associated economic activities. New stations and improvements to stations would provide opportunities to develop these areas as economic assets. These measures would all have a beneficial effect on the economy and help to promote economic transformation.

Medium Term: As urban areas become more compact under this scenario, the greater density of population within shorter distance and easier accessibility of economic assets would increase. This could be considered moderate beneficial.

Long Term: As urban areas become more compact under this scenario, the greater density of population within shorter distance and easier accessibility of economic assets would increase. This could be considered to continue as moderate beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **moderate beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Development of compact urban areas is anticipated to lead to more opportunities for co-location of housing and employment, along with new stations, station upgrades and development of multi-modal interchanges. This would require co-ordination of land use planning alongside strategic transport planning and could be considered slight beneficial.

Medium Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Long Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced congestion will have many benefits including on road safety, severance and environmental impacts. Access to facilities and services such as hospitals will be improved by better public transport and new rail connections. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive and digital connectivity reducing the need to travel. New roads and rail lines may have adverse impacts on severance and environmental impacts.

Medium Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Long Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 14. Also, individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced congestion will have many benefits including on road safety, severance and environmental impacts. Access to facilities and services will be improved by better public transport and new rail connections. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who do not have access to a car, and digital connectivity reducing the need to travel. New roads and rail lines may have adverse impacts on severance and environmental impacts.

Medium Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Long Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 15. Also, individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Improvements to stations and multimodal interchanges will lead to benefits in security and perception of safety with better lighting and more CCTV. An increase in walking and cycling will lead to more people on the streets, increasing passive surveillance and perception of security. Mode shift will reduce accidents, and CAVs will also help to improve road safety by removing human error, although they may not make up a high enough proportion of vehicles at this stage to maximise benefits.

Medium Term: The benefits from mode shift and reduced congestion will increase, as passive surveillance. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Long Term: The benefits from mode shift and reduced congestion will increase, as passive surveillance. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There will be both improved rail lines between urban areas and new stations, which will improve access by rail to services and facilities. The co-location of employment and housing may also lead to more easily accessible local services. New multi-modal interchanges will also help to improve accessibility for people. The improved walking/cycling access to public transport due to shorter distances to stations, hubs and shops will also enable more people to access services using public transport. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments. There is also the possibility of people being able to access some services digitally, removing physical barriers they may face. This may be beneficial to people who do not have access to a car, are disabled and older people. It may also be beneficial to children and young people in accessing educational establishments.

Medium Term: There are likely to be more improved rail lines and new stations in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital initiatives.

Long Term: There are likely to be more improved rail lines and new stations in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital initiatives.

Mitigation / Recommendations

Mitigation Measures See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Smart ticketing initiatives may include reduced public transport fares, especially for multimodal journeys, which would increase affordability. This alternative has high fuel costs, which could lead to less affordable transport for car users, although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles. Elements of this sub-objective could have beneficial and adverse impacts on certain groups of people. The increased fuel costs could have adverse impacts for people from income deprived areas, though the potential for cheaper ticketing would be beneficial.

Medium Term: There may be more opportunities for efficiency of tickets through smart ticketing, and the impact of high fuel costs may be higher on car users than in the short term.

Long Term: There may be more opportunities for efficiency of tickets through smart ticketing, and the impact of high fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Combined mode tickets should be considered as part of smart ticketing.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Improvements to interchanges and station facilities should include improvements to lighting and CCTV, which would reduce crime and fear of crime and promote community safety. The increased number of people on the streets due to higher levels of walking and cycling could also provide passive surveillance and improve the perception of security. This is likely to benefit young people, older people, disabled people, women and those from Black and minority ethnicities, who all may be more susceptible to a greater perception of safety.

Medium Term: More interchanges and stations will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Long Term: More interchanges and stations will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities should help to improve road safety and reduced the number of accidents, although the demand for car travel is still predicted to increase (although this scenario has the lowest increase of any scenario). Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. The increase in CAVs could also lead to improvements in road safety due to less chance for human error although the full benefits might not be realised until a higher proportion of vehicles are CAVs.

Medium Term: There is likely to be a greater reduction in car use and there are likely to be more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Long Term: There is likely to be a greater reduction in car use and there are likely to be more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Reduced congestion due to mode shift and reduced travel due to increased digital connectivity should reduce severance on key corridors. Improved walking and cycling access to public transport including improved routes, will also reduce severance. However, there will be new rail lines and roads that could cause increases in localised severance and will need to be mitigated individually.

Medium Term: The reduction in severance due to mode shift and reduced travel is likely to be greater, but there are likely to be more new rail lines and roads built in this time frame that may cause localised severance.

Long Term: The reduction in severance due to mode shift and reduced travel is likely to be greater again, but there are likely to be more new rail lines and roads built in this time frame that may cause localised severance.

Mitigation / Recommendations

Mitigation Measures See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Reduced congestion due to mode shift and reduced travel due to increased digital connectivity should reduce vibration and air, noise and light on key corridors. The increase in the use of hybrids and electric vehicles will also reduce the environmental impacts of traffic. However, there will be new rail lines and roads that could cause increases in localised environmental impacts and will need to be mitigated individually, such as through noise barriers. Adverse noise impacts could have adverse impacts on children. Furthermore, a reduction in air quality can have an adverse impact on children and disabled people, particularly those with respiratory conditions.

Medium Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater, but there are likely to be more new rail lines and roads built in this time frame that may cause localised air, noise and light pollution.

Long Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater again, but there are likely to be more new rail lines and roads built in this time frame that may cause localised air, noise and light pollution.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There will be both improved rail lines between urban areas and new stations, which will improve access by rail to services and facilities, including healthcare establishments such as hospitals. New multi-modal interchanges will also help to improve accessibility. The improved walking/cycling access to public transport due to shorter distances to stations, hubs and shops will also enable more people to access services using public transport. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments. There is also the possibility of people being able to access some services digitally, removing physical barriers they may face.

Medium Term: There are likely to be more improved rail lines and new stations in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Long Term: There are likely to be more improved rail lines and new stations in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Smart ticketing initiatives may include reduced public transport fares, especially for multimodal journeys, which would increase affordability. This alternative has high fuel costs, which could lead to less affordable transport for car users, although this is likely to have less of an impact on train and bus passengers as these are more likely to be electric or hybrid vehicles.

Medium Term: There may be more opportunities to make ticketing more efficient through smart ticketing, and the impact of high fuel costs may be higher on car users than in the short term.

Long Term: There may be more opportunities to make ticketing more efficient through smart ticketing, and the impact of high fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Combined mode tickets should be considered as part of smart ticketing.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Improvements to interchanges and station facilities should include improvements to lighting and CCTV, which would reduce crime and fear of crime and promote community safety. The increased number of people on the streets due to higher levels of walking and cycling, could also provide passive surveillance and improve the perception of security.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling, resulting in more passive surveillance and consequently improving community safety further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling, resulting in more passive surveillance and consequently improving community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities should help to improve road safety and reduced the number of accidents, though the demand for car travel is still predicted to increase (although this scenario has the lowest increase of any scenario). Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs.

Medium Term: There is likely to be a greater reduction in car use and an increase in cyclists as attitudes change, leading to a greater uptake of walking/cycling and public transport use, therefore making achieving a critical mass more likely. There are likely to be a higher proportion of CAVs, resulting in more benefits and an overall improvement to road safety.

Long Term: There is likely to be a greater reduction in car use and an increase in cyclists as attitudes change, leading to a greater uptake of walking/cycling and public transport use, therefore making achieving a critical mass more likely. There are likely to be a higher proportion of CAVs, resulting in more benefits and an overall improvement to road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Reduced congestion due to mode shift and increased digital connectivity, should reduce severance on key corridors. Improved walking and cycling access to public transport including enhanced routes, will reduce severance. However, there will be new rail lines and roads that could cause increases in localised severance and will need to be mitigated individually.

Medium Term: The reduction in severance due to mode shift and reduced travel is likely to be greater, but there are likely to be more new rail lines and roads built in this time frame that may cause localised severance.

Long Term: The reduction in severance due to mode shift and reduced travel is likely to be greater again, but there are likely to be more new rail lines and roads built in this time frame that may cause localised severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: The reduced congestion due to mode shift and increased digital connectivity, should reduce vibration and air, noise and light on key corridors. The increase in use of hybrids and electric vehicles will also reduce the environmental impacts of traffic. However, there will be new rail lines and roads that could cause increases in localised environmental impacts, which will need to be mitigated individually (for example using noise barriers).

Medium Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater, but there are likely to be more new rail lines and roads built in this time frame, which may cause localised air, noise and light pollution.

Long Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater again, but there are likely to be more new rail lines and roads built in this time frame, which may cause localised air, noise and light pollution.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities should help to improve road safety and reduced the number of accidents, although the demand for car travel is still predicted to increase (although this scenario has the lowest increase of any scenario). Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs.

Medium Term: There is likely to be a greater reduction in car use and there are likely to be more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There is likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Long Term: There is likely to be a greater reduction in car use and more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There is likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Improvements to interchanges and station facilities should include improvements to lighting and CCTV, which would improve actual and perceived safety. The increased number of people on the streets due to higher levels of walking and cycling could also provide passive surveillance and improve the perception of security.

Medium Term: More interchanges and stations will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety further.

Long Term: More interchanges and stations will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

F.4. Assessment of Strategic Alternatives – Transformational Scenario 2

Table F-6 Transformational Scenario 2 – Description and Key Assumptions

Scenario 2: Compact & Travel Friendly
• Urban areas are 'Compact', with brownfield development in the cores • Local transport systems focus on serving radial movements • Technological development has led to advances in 'Travel Friendly' connectivity options • Energy Costs and therefore travel costs are low • Rail anticipated to grow 327% • Road anticipated to grow 52%
Key Assumptions • Compact urban cores, together with greater 'travel friendly' connectivity, lead to more emphasis on public transport in and between urban areas. • Energy costs are low – therefore both road and rail are emphasised with new routes and route widening between urban areas. • Lower energy costs have greater effect on road usage (higher) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport, with new road routes and route widening between urban areas. • New stations and improvements to stations required (more than Scenario 1). • Multi-modal interchanges required (more than Scenario 1). • Lower uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 1, leading to potentially less efficient road space use and more parking space. • Lower uptake of LVEVs, compared to Scenario 1. • Opportunities for contamination remediation due to more brownfield use. • Less overall land take due to more compact development, but greater than Scenario 1, due to greater transport facility provision. • Less greenfield land take, but likely greater than Scenario 1. • Less need for motorised movement, and greater use of walking, cycling for shorter journeys. • More opportunities for co-location of housing and employment within compact urban areas. • Improved walking/cycling access to public transport due to higher population within shorter distances to stations, hubs and stops, and greater public transport provision (compared to Scenario 1). • More compact development generally higher density and more energy efficient (buildings as well as transport). • Less digital connectivity and greater road usage may lead to greater potential for road congestion in denser urban areas.

Table F-7 Assessment of Strategic Alternatives – Transformational Scenario 2

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg/ Nat	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Compact urban cores are anticipated to lead to more emphasis on public transport in and between urban areas, but under this scenario there would be continued increase in road travel, with an increase of 52% anticipated by 2050. There would be emphasis on both road and rail, with rail representing lower GHG emissions per travel kilometre. Compact urban areas would also likely result in greater opportunities for walking / cycling. This scenario also anticipates lower uptake of LVEVs compared to Scenario 1, though the STP does encourage their uptake and numbers would increase. There would also be less emphasis on digital connectivity and smart mobility technology under this scenario. It is anticipated that effects would be slight beneficial in terms of GHG emissions under this scenario.

Medium Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas, along with a gradual increase in the numbers of LVEV will continue to result in slight beneficial effects.

Long Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas, along with an overall increase in the numbers of LVEVs will continue to result in slight beneficial effects.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, compact urban cores will reduce the need for greenfield land take and the use of brownfield areas will provide opportunities to enhance habitat. The aim of the STP to support a net gain in biodiversity is likely to be less easy to achieve under this scenario, compared to Scenario 1. It is anticipated that effects will be slight beneficial.

Medium Term: Slight beneficial effects are anticipated to continue through the clear goal to support a net gain in biodiversity.

Long Term: Slight beneficial effects are anticipated to continue, through the clear goal to support a net gain in biodiversity.

Overall, it is anticipated that effects would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: Under this scenario urban areas are more likely to be compact. It is also the case that for the most part, sites designated for nature conservation at the international level are outside urban areas. However, there is still a potential for effects on these areas under this scenario. As more road infrastructure is anticipated under this scenario, it is likely that the potential risk of negative effects would be higher, compared to Scenario 1. However, the scenario provides insufficient detail to enable these effects to be meaningfully estimated and, while the STP notes specific measures to protect HRA relevant sites, potential effects are considered uncertain.

Medium Term: Effects will remain uncertain and are dependent upon the nature and location of interventions.

Long Term: Effects will remain uncertain and are dependent upon the nature and location of interventions.

As such it is considered that this Strategic Component will have **uncertain** effects on International Sites. Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

Mitigation

Mitigation Measures: See Mitigation Table 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Compact urban cores are anticipated to lead to more emphasis on public transport in and between urban areas, but under this scenario there would be greater anticipated increase (52% by 2050) in road travel, compared to Scenario 1. There would be emphasis on both road and rail, with rail representing lower air pollutant emissions per travel kilometre. Compact urban areas would also likely result in greater opportunities for walking / cycling. This scenario also anticipates lower uptake of LVEVs compared to Scenario 1, though the STP does encourage their uptake and numbers would increase. There would also be less uptake of digital connectivity and smart mobility technology under this scenario. It is anticipated that effects would be slight beneficial in terms of air quality under this scenario.

Medium Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas, along with a gradual increase in the numbers of LVEVs will continue to result in slight beneficial effects.

Long Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas, along with an overall increase in the numbers of LVEVs will continue to result in slight beneficial effects.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Greater resilience to extreme weather events and a changing climate will be promoted and supported by strategic components within the STP, e.g. increased use of SuDS. Under this scenario, it is anticipated that more compact urban cores could allow less need for motorised movement and a greater use of walking / cycling for shorter journeys, with potentially less disruption by extreme weather events. Compact cores could also lead to less greenfield land take (though more greenfield required than in Scenario 1) could also help to reduce changes to drainage patterns and increased runoff from urban areas, thereby helping to reduce the risk of flooding. Greater physical connectivity, compared to Scenario 1 could lead to greater susceptibility to disruption from extreme weather. It is considered that overall, benefits would be slight.

Medium Term: It is anticipated that under this scenario, trends toward more compact urban cores would continue and would allow greater resilience to extreme weather events as outlined in the short term, compared to Scenarios 3 and 4. However, increasingly severe effects of climate change may result in reduced resilience

Long Term: While it is considered extreme weather events are likely to increase in frequency and intensity, it is anticipated that under this scenario trends toward more compact urban cores would continue and would allow greater resilience to extreme weather events as outlined in the short term, compared to Scenarios 3 and 4. However, resilience may decline overall.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Protection of the water environment will be aided by the introduction of measures in the STP such as the increased use of SuDS. In this scenario, urban cores will be more compact, with an anticipated reduction in greenfield land take (though more than Scenario 1). This should help to reduce levels of polluted urban runoff. However, road usage would be higher than Scenario 1, with greater potential for congestion and accidents that could lead to pollution events. The anticipated higher road usage would also require a greater amount of road construction under this scenario. There would also be a lower uptake of LZEVs under this scenario compared to Scenario 1, resulting in an increased risk to the water environment from hydrocarbons, though their increased use, along with the continued introduction of SuDS would still represent a slight beneficial effect.

Medium Term: It is anticipated that the uptake of LZEVs would continue, as would the use of SuDS. However, the emphasis on road as well as rail could lead to higher polluted runoff, compared to Scenario 1. Overall beneficial effects would be considered slight.

Long Term: It is anticipated that trends in increased LZEV uptake would continue, with resulting benefits to the water environment. The use of SuDS on new transport interventions would also continue. However, the relatively greater emphasis on roads compared to Scenario 1 would act to reduce the overall beneficial effects to slight.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This scenario is anticipated to provide opportunities for contamination remediation due to the emphasis on brownfield development. Soil would also be protected from disturbance / contamination by the anticipated lower overall greenfield land take due to more compact development. There would still be a need for new / enhanced rail lines, as well as new / enhanced roads between urban areas and this could lead to soil disturbance / loss and the potential for contamination. Overall, however, it is considered that there would be slight beneficial effects from implementation of the STP under this scenario.

Medium Term: It is considered that the emphasis on brownfield areas would continue to provide opportunities for remediation of contaminated land. These benefits would outweigh the potential for disturbance to soil from interventions as measures would be taken under the STP to protect high value land and soils. Slight beneficial effects are therefore anticipated to continue.

Long Term: The benefits of utilising (and remediating) brownfield land and less need for greenfield development would continue.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Compact urban cores could lead to increased pressure on historic assets in these areas, but less greenfield land take may offer protection to historic / cultural features. Opportunities for enhancing historic assets could be provided, e.g. through the need to improve historic stations, and this would be encouraged through the strategic components outlined in the STP. These components include protection and enhancement for historic assets and archaeological investigation to be undertaken and this would increase understanding of our cultural heritage. The greater emphasis on road travel would lead to more road construction, compared to Scenario 1, and hence a higher potential risk of negative effects. Overall, however, it is anticipated that slight beneficial effects on cultural heritage would be experienced under this scenario.

Medium Term: Protection of historic assets would continue, along with opportunities to enhance historic assets taken. This is anticipated to continue to result in slight beneficial effects.

Long Term: Protection of historic assets would continue, along with opportunities to enhance historic assets taken. This is anticipated to continue to result in slight beneficial effects.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/ x	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Under this scenario, urban cores are anticipated to be more compact. This should result in less greenfield land take and therefore will help to protect landscapes, though it is anticipated that this will not be as beneficial as under Scenario 1 due to more land being required for transport facility provision. Townscapes could be changed under this scenario, but the STP would offer opportunities for enhancement in some areas, e.g. improvements to stations. This would also be enhanced through more emphasis on public transport and improved walking / cycling connections, which would also likely lead to a reduction in congestion in town centres, thereby helping to enhance townscapes. There is less uptake of LVEVs in this scenario, so this may have adverse effects on noise and pollution in the townscape. Both road and rail links between urban areas will increase under this scenario, with potential adverse effects for this ISA Objective. Less uptake of digital connectivity and smart mobility technology may result in greater potential for road congestion in denser urban areas. Overall, slight beneficial and adverse effects are anticipated under this scenario.

Medium Term: It is anticipated that slight beneficial and slight adverse effects will continue, though there would be an increased focus on development in urban cores and screening would begin to mature which would improve effects.

Long Term: Urban development will be increasingly concentrated in urban centres and screening will have matured, but there still may be issues such as greater potential for road congestion in denser urban areas. Therefore, it is considered there will be slight beneficial and slight adverse effects.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Greater concentration of development in urban centres is anticipated to lead to a general higher density and more energy efficiency (buildings as well as transport) which will manifest in a more prudent use of natural resources (energy, materials, water). There would also be an emphasis on public transport and an overall lower need for motorised transport, compared to Scenario 4. The construction of new road and rail links, rail station and interchange upgrades would likely result in requirements for additional resources and increased waste production, compared to Scenario 1. Opportunities are likely to be presented for using recycled materials, as well as reusing and/or recycling waste materials, during and after construction. In general, amounts of materials required for road construction are higher per kilometre than that for rail, so the emphasis on both road and rail under this scenario means this would present likely greater use of materials.

Medium Term: Development will be increasingly concentrated in urban cores and this would mean there is less greenfield development, which should reduce the generation of waste, though there is anticipated to be a lower uptake of digital connectivity and smart mobility technology, so this would entail higher resource use. It is anticipated that there will be slight beneficial effects.

Long Term: Development would continue to be increasingly concentrated in urban cores, thereby reducing the need for greenfield development, but a reduced uptake of digital connectivity and smart mobility technology, and ongoing requirement for road use, would result in only slight beneficial effects.

Overall, it is anticipated that there would be **slight beneficia**l effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓	Reg-Nat	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: Compact urban cores are anticipated to lead to more emphasis on public transport in and between urban areas. This would represent a lower carbon choice and be more affordable to a greater number of people than the private car. There would be emphasis on both road and rail, with rail representing a lower carbon choice, though affordability of both road (private car) and rail travel may be an issue. The compact urban areas would also likely result in greater opportunities for walking / cycling. It is anticipated that these developments would result in an enhancement in lower carbon, affordable transport choice and it is considered that effects would be moderate beneficial.

Medium Term: A continued emphasis on public transport in and between urban areas would help provide lower carbon, affordable transport choice – this would be considered to be moderate beneficial.

Long Term: Increasing concentration of development in urban cores and the continued emphasis on public transport in these areas will continue to result in moderate beneficial effects.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Reg-Nat	ST-LT	Perm	High	++	+++	+++	+++

Commentary

Short Term: Development of compact urban areas is anticipated to lead to more opportunities for co-location of housing and employment. There will also be higher population levels within a shorter distance of main economic / business areas, with a greater number of people likely be within easy travel time to economic centres due to travel friendly approach. With a greater use of digital connectivity and other measures to improve the use of public transport reducing congestion, it could potentially be easier for people to

access town centres and their associated economic activities. New stations and improvements to stations would provide opportunities to develop these areas as economic assets. These measures would all have a beneficial effect on the economy and help to promote economic transformation.

Medium Term: As urban areas become more compact under this scenario, the greater density of population within shorter distance and easier accessibility of economic assets would increase. The economic benefits of this will be boosted by having a larger population within easy travel time of these economic centres. This could be considered large beneficial.

Long Term: As urban areas become more compact under this scenario, the greater density of population within shorter distance and easier and more travel friendly accessibility of economic assets would increase. This could be considered to continue as large beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **large beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Development of compact urban areas is anticipated to lead to more opportunities for co-location of housing and employment, along with new stations, station upgrades and development of multi-modal interchanges. This would require co-ordination of land use planning alongside strategic transport planning and could be considered slight beneficial.

Medium Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Long Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced congestion will have many benefits on road safety, severance and environmental impacts. Access to facilities and services will be improved by better public transport and new rail connections. New roads and rail lines may have adverse impacts on severance and environmental impacts.

Medium Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections.

Long Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP. Individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced congestion will have many benefits including improved road safety, severance and environmental impacts. Access to facilities and services such as hospitals will also be improved by better public transport and new rail connections. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive and digital connectivity reducing the need to travel. New roads and rail lines may have adverse impacts on severance and environmental impacts.

Medium Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Long Term: The benefits from mode shift and reduced congestion will increase, as will accessibility due to more rail connections. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP. Individual new roads and rail lines should be considered in terms of severance and environmental impacts, and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Improvements to stations and multimodal interchanges will lead to benefits in security, and perception of security will also improve with better lighting and more CCTV. An increase in more people walking and cycling will lead to more people on the streets, increasing passive surveillance and perception of security. Mode shift will reduce accidents.

Medium Term: The benefits from mode shift and reduced congestion will increase, as will passive surveillance

Long Term: The benefits from mode shift and reduced congestion will increase, as will passive surveillance.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Low	++	+++	+++	+++

Commentary

Short Term: There will be both improved rail lines between urban areas and new stations which will improve access by rail to services and facilities, to a greater degree than scenario 1. New multi-modal interchanges will also help to improve accessibility. The improved walking/cycling access to public transport due to shorter distances to stations, hubs and shops will also enable more people to access services using public transport. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments, although this will be on a lesser scale than in scenario 1. Accessibility improvements will particularly help older people, disabled people, people with children and pregnant women, who may all have great access requirements.

Medium Term: There are likely to be more improved rail lines and new stations in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Long Term: There are likely to be more improved rail lines and new stations in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This alternative has low fuel costs, which could lead to more affordable transport for car users, and although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles there could still be a small impact in costs that could have an impact on fares. This is likely to benefit people living in income deprived areas in particular.

Medium Term: The impact of low fuel costs may be higher on car users than in the short term.

Long Term: The impact of low fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There will be more improvements to interchanges and station facilities than in Scenario 1, including improvements to lighting and CCTV, which could reduce crime and fear of crime and promote community safety. The increased number of people on the streets due to higher levels of walking and cycling could also provide passive surveillance, improving the perception of security. This is likely to benefit young people, older people, disabled people and people from Black and minority ethnic groups.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities should help to improve road safety through reducing the number of accidents. Although, the demand for car travel is still predicted to increase. Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. Any increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs (and this scenario is likely to have a lower uptake of CAVs). There is likely to be an increase in congestion in dense urban areas, which will have a detrimental impact on road safety, especially as in dense urban areas there are more likely to be potential conflicts between vehicles and pedestrians/cyclists.

Medium Term: A greater mode shift from car and more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. Although, a greater demand for car use is also likely. There is also likely to be more congestion in dense urban areas, and more pedestrians and cyclists may increase the potential for conflicts.

Long Term: A greater mode shift from car and more cyclists as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. Although, a greater demand for car use is also likely. There is also likely to be more congestion in dense urban areas, and more pedestrians and cyclists may increase the potential for conflicts.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced travel due to increased digital connectivity should reduce severance on key corridors, although higher levels of congestion in dense urban areas may increase severance, which is more likely to have an impact on a greater number of people. Improved walking and cycling access to public transport including improved routes will reduce severance. However, there will be new rail lines and roads that could cause increases in localised severance and will need to be mitigated individually. A reduction in severance is likely to benefit children, older people and disabled people.

Medium Term: The reduction in severance due to mode shift is likely to be greater, but congestion in dense urban areas and associated severance is also likely. There are also likely to be more new rail lines and roads built in this time frame, that may cause localised severance.

Long Term: The reduction in severance due to mode shift is likely to be greater, but congestion in dense urban areas and associated severance is also likely. There are also likely to be more new rail lines and roads built in this time frame, that may cause localised severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Reduced congestion due to mode shift and reduced travel due to increased digital connectivity should reduce vibration and air, noise and light on key corridors. The increase in use of hybrids and electric vehicles will also reduce the environmental impacts of traffic. However, there will be new rail lines and roads that could cause increases in localised environmental impacts and will need to be mitigated individually, such as through noise barriers. A reduction in air, noise and light pollution from transport would benefit children, older people and disabled people in particular.

Medium Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater, but there are likely to be new rail lines and roads built in this time frame, which may cause localised air, noise and light pollution.

Long Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater, but there are likely to be new rail lines and roads built in this time frame, which may cause localised air, noise and light pollution.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Low	++	+++	+++	+++

Commentary

Short Term: Improved rail lines between urban areas and new stations will improve access by rail to services and facilities, including healthcare facilities such as hospitals, to a greater degree than scenario 1. New multi-modal interchanges will also help to improve accessibility for people. Improved walking/cycling access to public transport due to shorter distances to stations, hubs and shops, will also enable more people to access services using public transport. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments, although this will be on a lesser scale than in scenario 1.

Medium Term: There are likely to be more improved rail lines and new stations in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Long Term: There are likely to be more improved rail lines and new stations in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This alternative has low fuel costs, which could lead to more affordable transport for car users, and although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles, there could still be a small impact in costs that could have a beneficial impact on fares.

Medium Term: The impact of low fuel costs may be higher on car users than in the short term.

Long Term: The impact of low fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There will be more improvements to interchanges and station facilities than in Scenario 1, which should include improvements to lighting and CCTV, which would reduce crime and fear of crime and promote community safety. The increased number of people on the streets due to higher levels of walking and cycling, could also provide passive surveillance and improve the perception of security.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling, therefore more passive surveillance, which will improve community safety further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling, therefore more passive surveillance, which will improve community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities, should help to improve road safety and reduced the number of accidents, although the demand for car travel is still predicted to increase. Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. Any increase in CAVs could also lead to improvements in road safety due to less chance for human error. Although, the full benefits might not be realised until a higher proportion of vehicles are CAVs, and this scenario is likely to have a lower uptake of CAVs. There is likely to be an increase in congestion in dense urban areas which will have a detrimental impact on road safety, especially as in dense urban areas there are more likely to be potential conflicts between vehicles and pedestrians/cyclists.

Medium Term: There is likely to be both a greater mode shift to cycling/walking and public transport, and also greater demand for car use. However, as attitudes change, there are likely to be more cyclists, leading to a greater uptake and making achieving a critical mass more likely. There is also likely to be more congestion in dense urban areas, and an increase in pedestrians and cyclists could increase the likelihood for conflict.

Long Term: There is likely to be both a greater mode shift to cycling/walking and public transport, and also greater demand for car use. However, as attitudes change, there are likely to be more cyclists, leading to a greater uptake and making achieving a critical mass more likely. There is also likely to be more congestion in dense urban areas, and an increase in pedestrians and cyclists could increase the likelihood for conflict.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift and reduced travel due to increased digital connectivity should reduce severance on key corridors, although higher levels of congestion in dense urban areas could increase severance, which is more likely to have an impact on a greater number of people. Improved walking and cycling access to public transport including improved routes will reduce severance. However, there will be new rail lines and roads that could cause increases in localised severance that will need to be mitigated individually.

Medium Term: The reduction in severance due to mode shift is likely to be greater, but congestion in dense urban areas and associated severance is also likely. There are also likely to be more new rail lines and roads built in this time frame, that may cause localised severance.

Long Term: The reduction in severance due to mode shift is likely to be greater, but congestion in dense urban areas and associated severance is also likely. There are also likely to be more new rail lines and roads built in this time frame, that may cause localised severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: The reduced congestion due to mode shift and reduced travel due to increased digital connectivity should reduce vibration and air, noise and light on key corridors. The increase in use of hybrids and electric vehicles will also reduce the environmental impacts of traffic. However, there will be new rail lines and roads that could cause increases in localised environmental impacts and will need to be mitigated individually, such as through noise barriers.

Medium Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater, but there are likely to be more new rail lines and roads built in this time frame that may cause localised air, noise and light pollution.

Long Term: The reduction in environmental impacts due to mode shift and reduced travel is likely to be greater again, but there are likely to be more new rail lines and roads built in this time frame that may cause localised air, noise and light pollution.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Mode shift encouraged by the improvements to public transport and walking and cycling facilities should help to improve road safety and reduced the number of accidents, although the demand for car travel is still predicted to increase. Improved walking/cycling access should also include safer routes, and the higher levels of cycling could contribute to a critical mass making cycling safer. Any increase in CAVs could also lead to improvements in road safety, due to less chance for human error. Although, the

full benefits might not be realised until a higher proportion of vehicles are CAVs, and this scenario is likely to have a lower uptake of CAVs. There is likely to be an increase in congestion in dense urban areas, which will have a detrimental impact on road safety, especially as in dense urban areas there are more likely to be potential conflicts between vehicles and pedestrians/cyclists.

Medium Term: There is likely to be greater mode shift from car, although also a greater demand for car use. An increase in cyclists is also likely, as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There is also likely to be more congestion in dense urban areas, and if there are more pedestrians and cyclists there is more potential for conflict with traffic.

Long Term: There is likely to be greater mode shift from car, although also a greater demand for car use. An increase in cyclists is also likely, as attitudes change, leading to a greater uptake and making achieving a critical mass more likely. There is also likely to be more congestion in dense urban areas, and if there are more pedestrians and cyclists there is more potential for conflict with traffic.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: There will be more improvements to interchanges and station facilities than in Scenario 1, which should include improvements to lighting and CCTV This is likely to reduce crime and fear of crime and improve security issues. The increased number of people on the streets due to higher levels of walking and cycling could also provide passive surveillance, improving the perception of security.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety and security further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety and security further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

F.5. Assessment of Strategic Alternatives – Transformational Scenario 3

Table F-8 Transformational Scenario 3 – Description and Key Assumptions

Scenario 3: Dispersed and Digital
• Urban areas are 'Dispersed', with mixed greenfield and brownfield development in the suburbs and urban fringes • Local transport systems provide for all types of cross-district movement • Technological development has led to preference for 'Digital' rather than physical connectivity • Energy costs and therefore travel costs are high • Rail anticipated to grow 60% • Road anticipated to grow 27%
Key Assumptions • Greater emphasis on road improvement in urban areas due to dispersed nature of development and need to allow easy cross-district movement. • Higher energy costs have greater effect on road usage (lower) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport. • Greater uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 2, leading to potentially more efficient road space use and less parking space. • Higher uptake of low/zero emission vehicles (LZEVs), compared to Scenario 4. • Higher uptake of LZEVs, compared to Scenario 4. • Rail emphasised between urban areas with route upgrades required. Less requirement for new lines. • Lowest overall movement increase compared to all other scenarios likely to result in less overall land take. • More greenfield land take, compared to Scenarios 1 and 2. • Fewer opportunities for contamination remediation due to less brownfield land take. • Fewer opportunities for non-motorised movement for short journey as development less compact and likely to be less co-location of housing and employment. • Less compact development generally lower density and less energy efficient (buildings as well as transport).

Table F-9 Assessment of Strategic Alternatives – Transformational Scenario 3

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg/ Nat	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: Under this scenario, it is anticipated that rail will be emphasised between urban areas (though less than in Scenario 1), which results in lower GHG emissions per travel kilometre compared to road based fossil fuelled vehicles. While this scenario anticipates dispersed settlement, which would likely result in less cycling and walking compared to Scenario 1, it is anticipated this also results in the lowest overall movement increase compared to all the other scenarios and this would be aided by the growth in digital connectivity and smart mobility technology, and the anticipated higher energy costs. Higher uptake of LZEVs is anticipated under this scenario, which should act to reduce GHG emissions. It is anticipated that there will be moderate beneficial effects under this scenario.

Medium Term: Continued encouragement of rail transport would represent beneficial effects, together with relatively low growth in private motorised vehicle use, greater uptake of digital connectivity and smart mobility technology, and greater uptake of LVEVs. Effects are anticipated to remain moderate beneficial.

Long Term: Continued encouragement of rail transport would represent beneficial effects, together with relatively low growth in private motorised vehicle use, greater uptake of digital connectivity and smart mobility technology, and greater uptake of LVEVs. Effects are anticipated to remain moderate beneficial.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/ ✗	Local	ST-LT	Perm	Low	+/-	+/-	+	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). Under this scenario there will be an increased need for greenfield land take and this can be expected to have an adverse effect. The aim of the STP to support a net gain in biodiversity is likely to be more difficult to achieve under this scenario, compared to Scenario 1. It is anticipated that effects would be a mix of slight beneficial and slight adverse.

Medium Term: Slight beneficial effects are anticipated to continue through the clear goal to support a net gain in biodiversity, but this would be reduced by the loss of greenfield land. Effects are therefore anticipated to be a mix of slight adverse and slight beneficial.

Long Term: Slight beneficial effects are anticipated to continue, through the clear goal to support a net gain in biodiversity. Loss of greenfield land may be outweighed by reduced effects from road transport and lower overall connectivity.

Overall, it is anticipated that there will be a **mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Reg/ Nat	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: Under this scenario urban areas are more likely to be compact. It is also the case that for the most part, sites designated for nature conservation at the International level are outside urban areas. However, there is still a potential for effects on these areas under this scenario. As less road infrastructure is anticipated under this scenario, it is likely that the potential risk of negative effects would be lower, compared to Scenario 4. However, the scenario provides insufficient detail to enable these effects to be meaningfully estimated and, while the STP notes specific measures to protect HRA relevant sites, potential effects are considered uncertain.

Medium Term: Effects will remain uncertain and are dependent upon the nature and location of any intervention.

Long Term: Effects will remain uncertain and are dependent upon the nature and location of any intervention.

As such it is considered that this Strategic Component will have **uncertain** effects on International Sites. Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

Mitigation

Mitigation Measures: See Mitigation Table 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local	ST-LT	Perm	Med	++	++	+++	++

Commentary

Short Term: Under this scenario, it is anticipated that rail will be emphasised between urban area (though less than in Scenario 1), which results in lower air pollutant emissions per travel kilometre compared to road based fossil fuelled vehicles. While this scenario anticipates dispersed settlement, which would likely result in less cycling and walking compared to Scenario 1, it is anticipated this also results in the lowest overall movement increase compared to all the other scenarios and this would be aided by the growth in digital connectivity and smart mobility technology, and the anticipated higher energy costs. Higher uptake of LZEVs is anticipated under this scenario, which will act to reduce air pollutant emissions. It is anticipated that there will be moderate beneficial effects under this scenario.

Medium Term: Continued encouragement of rail transport would represent beneficial effects, together with relatively low growth in private motorised vehicle use, greater uptake of digital connectivity and smart mobility technology, and greater uptake of LVEVs. Effects are anticipated to remain moderate beneficial.

Long Term: Continued encouragement of rail transport would represent beneficial effects, together with relatively low growth in private motorised vehicle use, greater uptake of digital connectivity and smart mobility technology, and greater uptake of LVEVs. Effects are anticipated to remain moderate beneficial.

Overall, it is anticipated that under this scenario there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓/ ✗	Local	ST-LT	Perm	Med	+	+/-	+/-	+/-

Commentary

Short Term: Urban areas are dispersed under this scenario, with more greenfield land take. This would potentially contribute to greater urban runoff and increase the risk of flooding, though measures outlined under the STP such as SuDS would act to reduce this effect. Dispersed settlement would also mean there would be reduced opportunities for non-motorised journeys. This scenario would also see greater digital connectivity which would reduce the need for physical connectivity and therefore would not be as susceptible to disruption from extreme weather. However, greater uptake of LZEVs and smart mobility technology may lead to a reduction in resilience due to increased reliance on electricity network. Overall, effects are anticipated to be a mix of slight beneficial.

Medium Term: It is anticipated that under this scenario, trends toward more dispersed urban centres, with the effects noted above, together with greater uptake of digital connectivity, smart mobility technology and LZEVs would lead to a mix of slight beneficial and slight adverse effects.

Long Term: Urban centres would be increasingly dispersed, with adverse effects likely to be exacerbated by this, e.g. further loss of greenfield land, continued reduction in opportunities for non-motorised journeys, etc. Though overall physical connectivity would be lower than all other scenarios, greater uptake of digital connectivity, smart mobility technology and LZEVs may result in declining resilience. A continued mix of slight beneficial and slight adverse effects is anticipated.

Overall, it is anticipated that under this scenario there would be mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/ ✗	Local	ST-LT	Perm	Med	-	+/-	+/-	+/-

Commentary

Short Term: Protection of the water environment will be aided by the introduction of measures in the STP such as the increased use of SuDS. In this scenario, urban areas will be more dispersed, with an anticipated increase in greenfield land take. This could result in increased levels of polluted urban runoff. Greater digital connectivity would reduce potential for road congestion, with an associated potential reduction in accidents. This could help to reduce pollution events. This reduction in the potential accidental release of hydrocarbons would also be aided by the anticipated higher uptake LZEVs. It is anticipated there would be slight adverse effects under this scenario.

Medium Term: It is anticipated that the uptake of LZEVs would increase, along with enhanced digital connectivity and smart mobility technology. These trends would help to protect the water environment, though the dispersed nature of settlement would continue to likely result in increased polluted runoff from roads, etc. It is anticipated there would be a continuing mix of slight beneficial and slight adverse effects under this scenario.

Long Term: In the longer term, it is anticipated that trends in increased LZEVs would continue, along with digital connectivity and smart mobility technology, with associated benefits to the water environment. The use of SuDS on new transport interventions would also have increased. However, the further dispersed nature of settlement would result in higher levels of polluted runoff, with a continuing mix of slight beneficial and slight adverse effects under this scenario.

Overall, it is anticipated that under this scenario there would be mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local-Reg	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: This scenario is of dispersed urban areas, with an anticipated growth of suburbs and likely expansion of the urban fringe. This would include greater emphasis on road improvement in urban areas and could lead to the loss of greenfield areas and consequent loss of soil resources. There would also be fewer opportunities for contamination remediation due to less brownfield land take. There would be an emphasis on rail between urban areas with route upgrades required, but less requirement for new lines. It is anticipated that effects would be slight adverse.

Medium Term: It is anticipated that under this scenario, trends toward dispersed urban areas would continue, with further loss of greenfield areas and consequent loss of soil resources. Slight adverse effects are anticipated.

Long Term: The dispersed settlement pattern would continue to result in a loss of soil resources and potential for contamination of new areas. Brownfield opportunities would likely be less at this stage, as many areas will have already been redeveloped. Continued slight adverse effects are anticipated.

Overall, it is anticipated that under this scenario there would be **slight adverse effects** from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/ ✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+	+/-

Commentary

Short Term: Greater greenfield land take, including the need for new transport infrastructure, under this dispersed scenario means there is a greater chance that there could be adverse effects on the setting of historic assets. Greenfield areas are more likely to have unknown archaeological features that have not previously been disturbed by urban development, though the STP has measures to address this issue. These components include protection and enhancement for historic assets and archaeological investigation to be undertaken, and this would increase understanding of our cultural heritage. Lower overall movement, increased uptake of digital connectivity and LVEVs could provide benefits in both urban and rural areas, but overall it is anticipated that slight beneficial and slight adverse effects on cultural heritage would be experienced under this scenario.

Medium Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. This is anticipated to continue to result in slight beneficial and slight adverse effects.

Long Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. Increasing uptake of digital connectivity, smart mobility technology and LZEVs would result in reduced negative effects on setting of historic assets. This is anticipated to result in slight beneficial effects.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/ ✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+	+/-

Commentary

Short Term: Under this scenario, urban areas are dispersed. This would result in increased greenfield land take with the potential expansion of suburbs and the urban fringe and as such may have an adverse effect on landscapes. Townscapes may be improved through a reduction in congestion achieved through increased digital connectivity etc. Overall this is anticipated to result in slight beneficial and adverse effects under this scenario.

Medium Term: It is anticipated that a mix of slight beneficial and slight adverse effects would continue due to the continued expansion of urban areas along with the increase in digital connectivity. Screening of development would not yet be fully developed.

Long Term: While screening of development may have reached maturity, there would still be significant new elements in the landscape. Digital connectivity etc. may have also increased to continue to bring some beneficial effects.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling.	✗	Local-Reg	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: It is anticipated that higher energy costs under this scenario will lead to lower road usage and relatively low overall movement compared to other scenarios due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport. This would mean that this scenario would be slightly more beneficial than scenario 1 in terms of use of natural resources. The dispersed nature of settlement also means that distances travelled would generally be higher, with less opportunity for non-motorised movements, though these adverse effects may be reduced by increased uptake of digital connectivity and smart mobility technology. It is also anticipated that this scenario would have less compact development of generally lower density and less energy efficiency (buildings as well as transport). Overall it is considered that there would be slight adverse effects under this scenario.

Medium Term: While higher energy costs would continue to lead to lower road usage and there would be a continued increase in digital connectivity, there are still anticipated to be slight adverse effects due to the dispersed nature of settlement.

Long Term: The nature of settlement would continue to be dispersed and would require continued greater levels of resource use in both operation and maintenance. There would continue to be an increase in digital connectivity, but overall slight adverse effects are anticipated.

Overall, it is anticipated that under this scenario there would be **slight adverse effects** from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓/ ✗	Reg-Nat	ST-LT	Perm	Med	-	+/-	+/-	+/-

Commentary

Short Term: Under this scenario, it is anticipated that rail will be emphasised between urban areas and this would be a lower carbon choice compared to car (traditionally powered). It is also anticipated that higher energy costs would encourage public transport use, which would represent a lower carbon more affordable choice. There would be an emphasis on road improvement in urban areas due to dispersed nature of development and need to allow easy cross-district movement. Effects are anticipated to be slight adverse.

Medium Term: Continued encouragement of public transport use would represent beneficial effects, though the nature of the dispersed settlement would still result in car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Effects are anticipated to be a mix of slight beneficial and slight adverse.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though the nature of the dispersed settlement would still result in car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Effects are anticipated to be a mix of slight beneficial and slight adverse.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓/ ✗	Reg-Nat	ST-LT	Perm	High	+/-	+/-	+/-	+/-

Commentary

Short Term: Dispersed urban areas, with digital connectivity may result in less opportunities for co-location of housing and employment. This scenario also results in less overall travel and perhaps less commercial transactions through issues such as 'impulse purchases', though there may be an uptake in e-commerce due to the increase in digital connectivity. It is considered effects would be a mix of slight beneficial and slight adverse.

Medium Term: It is anticipated that a mix of slight beneficial and adverse effects would continue through a continued shift away from physical shopping to e-commerce, due to the more dispersed settlement pattern aligned with digital connection.

Long Term: It is anticipated that growth of e-commerce would continue under this scenario, alongside a reduction in physical shopping / commerce. This would continue to result in a mix of slight beneficial and slight adverse effects.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Development of dispersed urban areas would require co-ordination of land use planning alongside strategic transport planning across a large area and likely a number of different authorities and could be considered slight beneficial.

Medium Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Long Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift and reduced congestion will have many benefits including on road safety, reduced severance and beneficial environmental impacts. Access to facilities and services will be improved by new rail connections between urban areas, although local networks are likely to be more car based. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive and digital connectivity reducing the need to travel. A car focused local urban network is likely to have an adverse impact on severance, road safety and environmental impacts.

Medium Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles. Digital connectivity is likely to improve further.

Long Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles. Digital connectivity is likely to improve further.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects. Individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift and reduced congestion will have many benefits including on road safety, severance and environmental impacts. Access to facilities and services such as hospitals will be improved by new/upgraded rail connections between urban areas, although local networks are likely to be more car based. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive and digital connectivity reducing the need to travel. A car focused local urban network is likely to have an adverse impact on severance, road safety and environmental impacts.

Medium Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles. Digital connectivity is likely to improve further.

Long Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles. Digital connectivity is likely to improve further.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects. Individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift will reduce accidents, and CAVs will also help to improve road safety by removing human error, although they may not make up a high enough proportion of vehicles at this stage to maximise benefits. Road improvements in urban areas may also improve road safety. There is unlikely to be any impact on community safety and crime as no changes are planned to facilities/interchanges.

Medium Term: Benefits due to CAVs are likely to increase as they make up a greater proportion of vehicles.

Long Term: Benefits due to CAVs are likely to increase as they continue to make up a greater proportion of vehicles.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be both improved rail lines between urban areas and new stations, which will improve access by rail to services and facilities. The co-location of employment and housing may also lead to more easily accessible local services. However, connections within the urban areas are likely to be car-based and so there will be less benefits for public transport users making these movements. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments. There is also the possibility of people being able to access some services digitally, removing physical barriers they may face. These impacts are likely to benefit children and young people accessing educational facilities, older people, disabled people and pregnant women or people with prams/pushchairs.

Medium Term: There are likely to be more improved rail lines in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Long Term: There are likely to be more improved rail lines in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Smart ticketing initiatives may include reduced public transport fares, especially for multimodal journeys, which would increase affordability. This may benefit people living in areas with higher levels of income deprivation. However, this alternative has high fuel costs, which could lead to less affordable transport for car users, although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles.

Medium Term: There may be more opportunities for ticketing efficiency through smart ticketing and the impact of high fuel costs may be higher on car users than in the short term.

Long Term: There may be more opportunities for ticketing efficiency through smart ticketing and the impact of high fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Combined mode tickets should be considered as part of smart ticketing.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	0	Local-Reg	MT-LT	Perm	Low	0	0	0	0

Commentary

Short Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Medium Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Long Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: More efficient use of road space should help to improve road safety and reduce the number of accidents, although the demand for car travel is still predicted to increase (although this scenario has one of the lowest increases in road demand). The increase in CAVs could also lead to improvements in road safety due to less chance for human error although the full benefits might not be realised until a higher proportion of vehicles are CAVs. The road improvements in urban areas could also improve road safety. These are likely to benefit children, older people, cyclists and pedestrians.

Medium Term: There are likely to be more road improvements in urban areas resulting in more improved road safety. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Long Term: There are likely to be more road improvements in urban areas resulting in more improved road safety. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be new/upgraded rail lines and roads that could cause increases in localised severance, which will need to be mitigated individually, although there will be fewer new rail lines than scenario 1. The focus on car-based travel for journeys on the local network is likely to increase traffic and so increase severance. Reduced need to travel due to digital connectivity may reduce traffic and reduce severance. These benefits are likely to be experienced by children, older people and disabled people.

Medium Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements, which may cause localised severance. Reductions in traffic and severance due to digital connectivity are likely to be greater.

Long Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements, which may cause localised severance. Reductions in traffic and severance due to digital connectivity are likely to be greater.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be new/upgraded rail lines and roads that could cause increases in localised environment, which will need to be mitigated individually, although there will be less new rail lines than scenario 1. The focus on car-based travel for journeys on the local network is likely to increase traffic and so increase environmental impacts. Reduced need to travel due to digital connectivity may reduce traffic and environmental impacts. A reduction in air, noise and light pollution from transport will be beneficial for children, older people and disabled people, particularly those with respiratory illnesses.

Medium Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements that may cause localised environmental impacts. Reductions in traffic and environmental due to digital connectivity are likely to be greater.

Long Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements that may cause localised environmental impacts. Reductions in traffic and environmental impacts due to digital connectivity are likely to be greater.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be both improved rail lines between urban areas and new/upgraded stations, which will improve access by rail to services and facilities, including healthcare facilities, such as hospitals. However, connections within the urban areas are likely to be car-based, which will have fewer benefits for public transport users making these movements. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments. There is also the possibility of people being able to access some services digitally, removing physical barriers they may face.

Medium Term: There are likely to be more improved rail lines in the medium term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Long Term: There are likely to be more improved rail lines in the long term, as well as more multimodal interchanges and more CAVs, improving accessibility further. It may also be possible to replace more services with digital versions.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Smart ticketing initiatives may include reduced public transport fares, especially for multimodal journeys, which would increase affordability. This alternative has high fuel costs, which could lead to less affordable transport for car users, although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles.

Medium Term: There may be more opportunities for efficiency of tickets through smart ticketing and the impact of high fuel costs may be higher on car users than in the short term.

Long Term: There may be more opportunities for efficiency of tickets through smart ticketing and the impact of high fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Combined mode tickets should be considered as part of smart ticketing.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	0	Local-Reg	MT-LT	Perm	Low	0	0	0	0

Commentary

Short Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Medium Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Long Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: More efficient use of road space should help to improve road safety and reduce the number of accidents. However, the demand for car travel is still predicted to increase (although this scenario has one of the lowest increases in road demand). The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs. The road improvements in urban areas could also improve road safety.

Medium Term: There are likely to be more road improvements in urban areas resulting in more improved road safety. There are also likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Long Term: There are likely to be more road improvements in urban areas resulting in more improved road safety. There are also likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be new/upgraded rail lines and roads that could cause an increase in localised severance, which will need to be mitigated individually, although there will be less new rail lines than scenario 1. The focus on car-based travel for journeys on the local network is likely to increase traffic and consequently increase severance. Reduced need to travel due to digital connectivity may reduce traffic and reduce severance.

Medium Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements that may cause localised severance. Reductions in traffic and severance due to digital connectivity are likely to be greater.

Long Term: There are likely to be more new rail lines and roads built in this time frame as well as road improvements that may cause localised severance. Reductions in traffic and severance due to digital connectivity are likely to be greater.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be new/upgraded rail lines and roads that could cause increases in localised environment impacts of transport - vibration and air, noise and light pollution, which will need to be mitigated individually. Although there will be less new rail lines than scenario 1. The focus on car-based travel for journeys on the local network is likely to increase traffic and consequently increase environmental impacts. Reduced need to travel due to digital connectivity may reduce traffic and environmental impacts.

Medium Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements, which may cause localised environmental impacts. Reductions in traffic and environmental due to digital connectivity are likely to be greater.

Long Term: There are likely to be new/upgraded rail lines and roads built in this time frame as well as road improvements, which may cause localised environmental impacts. Reductions in traffic and environmental impacts due to digital connectivity are likely to be greater.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: More efficient use of road space should help to improve road safety and reduce the number of accidents. Although the demand for car travel is still predicted to increase, this scenario has one of the lowest increases in road demand. The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs. The road improvements in urban areas could also improve road safety.

Medium Term: There is likely to be more road improvements in urban areas resulting in more improved road safety. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Long Term: There is likely to be more road improvements in urban areas resulting in more improved road safety. There are likely to be a higher proportion of CAVs and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	0	Local-Reg	MT-LT	Perm	Low	0	0	0	0

Commentary

Short Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Medium Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Long Term: This scenario is unlikely to have a significant impact on crime and community safety as there are no planned changes to facilities and interchanges, and no large increase in walking and cycling to provide extra passive surveillance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

F.6. Assessment of Strategic Alternatives – Transformational Scenario 4

Table F-10 Transformational Scenario 4 – Description and Key Assumptions

Scenario 4: Dispersed and Travel Friendly
• Urban areas are 'Dispersed', with mixed greenfield and brownfield development in the suburbs and urban fringes • Local transport systems provide for all types of cross-district movement • Technological development has led to advances in 'Travel Friendly' connectivity options • Energy costs and therefore travel costs are low • Rail anticipated to grow 136% • Road anticipated to grow 54%
Key Assumptions • Greater emphasis on road improvement in urban areas due to dispersed nature of development and need to allow easy cross district movement, but all types of mode considered. • Lower energy costs have greater effect on road usage (higher) due to greater elasticity of road use pricing (fuel cost) compared to rail and other public transport, with new road routes and route widening between urban areas. • Lower uptake of digital connectivity and smart mobility technology (CAVs, smart ticketing, etc), compared to Scenario 3, leading to potentially less efficient road space use and more parking space. • Lower uptake of low/zero emissions vehicles (LZEVs), compared to Scenario 3. • New rail lines and line upgrades required for inter-urban routes. • Multi-modal interchanges required. • Emphasis placed on full and continuous implementation of Smart. • Higher land take compared to Scenario 3. Fewer opportunities for contamination remediation. • More overall land take compared to Scenario 3. • More greenfield land take, compared to Scenarios 1, 2 and 3. • Fewer opportunities for non-motorised movement for short journeys as development less compact. However, greater public transport connections may encourage more walking / cycling more (relative to Scenario 3). • Less compact development generally lower density and less energy efficient (buildings as well as transport).

Table F-11 Assessment of Strategic Alternatives – Transformational Scenario 4

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg/ Nat	ST-LT	Perm	Med	-	+	+	+

Commentary

Short Term: This scenario is anticipated to result in road growth slightly higher than Scenario 2 and rail growth slightly more than twice that of Scenario 3. This would be realised by lower uptake of digital connectivity and smart mobility technology, as well as lower energy costs encouraging greater overall movement, compared to Scenario 3. Under this scenario there is a lower uptake of LZEVs. Overall, GHG emissions are anticipated to be slightly higher than Scenario 2. It is anticipated that effects would be slight adverse.

Medium Term: Low energy costs would continue to encourage the use of private vehicles. While uptake of LZEVs would be lower in this scenario, there would still be some uptake and this could be beneficial in terms of GHG emissions. Overall, slight beneficial effects are anticipated.

Long Term: Low energy costs would continue to encourage the use of private vehicles. While uptake of LZEVs, smart mobility technology and digital connectivity would be lower in this scenario, uptake would continue. Overall, in slight beneficial effects are anticipated.

Overall, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/ ✗	Local	ST-LT	Perm	Low	+/-	+/-	+	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). Under this scenario there will be an increased need for greenfield land take and this can be expected to have an adverse effect. The aim of the STP to support a net gain in biodiversity is likely to be more difficult to achieve under this scenario. It is anticipated that effects will be a mix of slight beneficial and slight adverse.

Medium Term: Slight beneficial effects are anticipated to continue through the clear goal to support a net gain in biodiversity, but this will be reduced by the loss of greenfield land. Effects are therefore anticipated to be a mix of slight adverse and slight beneficial.

Long Term: Slight beneficial effects are anticipated to continue, through the clear goal to support a net gain in biodiversity. Continued uptake of LZEVs, smart mobility technology and digital connectivity, though lower than Scenario 3, are anticipated to result in slight beneficial effects.

Overall, it is anticipated that there will be a mix of **slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local -Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: Under this scenario, urban areas are anticipated to be more dispersed, with potentially higher greenfield land take. It is also the case that for the most part, sites designated for nature conservation at the International level are outside urban areas. However, there is still potential for effects on these areas under this scenario. As more road infrastructure is anticipated under this scenario, it is likely that the potential risk of negative effects would be higher, compared to Scenario 3. However, the scenario provides insufficient detail to enable these effects to be meaningfully estimated and, while the STP notes specific measures to protect HRA relevant sites, potential effects are considered uncertain.

Medium Term: Effects will remain uncertain and are dependent upon the nature and location of any intervention.

Long Term: Effects will remain uncertain and are dependent upon the nature and location of any intervention.

Overall, it is anticipated that this Strategic Component would have **uncertain** effects on International Sites.

Mitigation

Mitigation Measures: See Mitigation Table 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✕	Local -Reg	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: While anticipated road movement growth, encouraged by lower energy costs, is slightly higher than Scenario 2, anticipated rail growth is much lower, as well as lower expected uptake of LZEVs, smart mobility technology and digital connectivity. This is anticipated to result in slight adverse effects.

Medium Term: Low energy costs would continue to encourage the use of private vehicles. While uptake of LZEVs, smart mobility technology and digital connectivity would be lower in this scenario, it is likely to accelerate and this could be beneficial in terms of reducing emissions, resulting in slight adverse effects.

Long Term: Low energy costs would continue to encourage the use of private vehicles. While uptake of LZEVs, smart mobility technology and digital connectivity would be lower in this scenario, it is likely to accelerate and this could be beneficial in terms of reducing emissions, resulting in slight adverse effects.

Overall, there would be **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✕	Local	ST-LT	Perm	Med	-	-	--	-

Commentary

Short Term: Urban areas are dispersed under this scenario, with more greenfield land take (with the greatest amount under this scenario), and considerably more road infrastructure is anticipated. This would potentially contribute to greater runoff and increase the risk of flooding, though measures outlined under the STP such as SuDS would act to reduce this effect. Dispersed settlement would also mean there would be reduced opportunities for non-motorised journeys. However, there would be reduced uptake of LZEVs, smart mobility technology and digital connectivity, which may help resilience due to less reliance on the electrical network. Overall, however, effects are anticipated to be slight adverse.

Medium Term: It is anticipated that trends toward more dispersed urban centres, with the effects noted above, would lead to continued slight adverse effects as extreme weather gets more frequent and intense.

Long Term: Urban centres would be increasingly dispersed, with adverse effects likely to be exacerbated by this, e.g. further loss of greenfield land, continued reduction in opportunities for non-motorised journeys, etc. There is also likely to be accelerated uptake of LZEVs, smart mobility technology and digital connectivity, with increased reliance on the electrical network potentially reducing reliance as climate change effects worsen. Moderate adverse effects are anticipated.

Overall, it is anticipated that under this scenario there would be **slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✕	Local	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: Protection of the water environment will be aided by the introduction of measures in the STP such as the increased use of SuDS. In this scenario, urban areas will be more dispersed, with an anticipated increase in greenfield land take (largest amount under this scenario). This could result in increased levels of polluted urban runoff. Lower uptake of LZEVs, smart mobility technology and digital connectivity would lead to higher risk of hydrocarbon release in the event of an accident, especially as it is anticipated that low energy costs would result in higher road usage. It is anticipated that effects could be moderate adverse.

Medium Term: The dispersed nature of settlement would continue to likely result in increased urban runoff from roads, etc. though increased use of SuDS could help to reduce adverse effects. The slower uptake of LZEVs, smart mobility technology and digital connectivity would continue to mean there is a greater risk of accidental release of hydrocarbons and low energy costs would mean that road usage would remain high. It is anticipated that effects would be slight adverse.

Long Term: The dispersed nature of settlement would continue to likely result in increased urban runoff from roads etc. though further increased use of SuDS could help to reduce adverse effects. There is also likely to be accelerated uptake of LZEVs, smart mobility technology and digital connectivity, which would reduce the risk of accidental release of hydrocarbons. It is anticipated that effects would remain slight adverse.

Overall, it is anticipated that under this scenario there would be **slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local -Reg	ST-LT	Perm	Med	--	--	--	--

Commentary

Short Term: This scenario anticipates more dispersed urban areas, with an anticipated growth of suburbs and likely expansion of the urban fringe. This would include greater emphasis on road improvement in urban areas and could lead to the loss of greenfield areas (largest amount under this scenario) and consequent loss of soil resources. There would also be fewer opportunities for contamination remediation due to less brownfield land take. It is considered these would be moderate adverse effects.

Medium Term: It is anticipated that under this scenario trends toward dispersed urban areas would continue, with further loss of greenfield areas and consequent loss of soil resources, as well as fewer opportunities for remediation of previously contaminated land. It is considered that moderate adverse effects would continue.

Long Term: The dispersed settlement pattern would continue to result in a loss of soil resources and potential for contamination of new areas. Brownfield opportunities likely to be less at this stage, as many areas will have already been redeveloped. Continued moderate adverse effects are anticipated.

Overall, it is anticipated that under this scenario there would be **moderate adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/ ✗	Local -Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: With greater greenfield land take, including the need for new transport infrastructure, anticipated under this scenario there is a greater chance that there could be an adverse effect on the setting of historic assets, compared to Scenario 2. It is also the case that greenfield areas are more likely to have unknown archaeological features that have not previously been disturbed by urban development, though the STP has measures to address this issue. These components include protection and enhancement for historic assets and archaeological investigation to be undertaken and this would increase understanding of our cultural heritage. Overall it is anticipated that slight beneficial and slight adverse effects on cultural heritage would be experienced under this scenario.

Medium Term: Protection of historic assets would continue, along with opportunities to enhance historic assets. This is anticipated to continue to result in slight beneficial and slight adverse effects.

Long Term: Protection of historic assets would continue, along with opportunities to enhance historic assets taken. This is anticipated to continue to result in slight beneficial and slight adverse effects.

Overall, it is anticipated that under this scenario there would be a **mix of slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local -Reg	ST-LT	Perm	Med	--	--	-	--

Commentary

Short Term: Under this scenario urban areas are dispersed. This will result in increased greenfield land take with the potential expansion of suburbs and the urban fringe, along with new / widened road and rail lines and as such may have an adverse effect on landscapes. Townscapes may be subject to congestion due to higher road use from low energy prices. Overall this is anticipated to result in moderate adverse effects under this scenario.

Medium Term: Screening of development would not yet be fully developed and there would be an increasing amount of new elements in the landscape. Congestion in town centres could possibly be an issue due to continued low energy costs favouring use of private vehicles.

Long Term: While screening of development may have reached maturity, there would still be significant new elements in the landscape. Congestion in town centres could potentially be an issue. Negative effects may reduce with continued uptake of LZEVs and smart mobility technology.

Overall, it is anticipated that under this scenario there would be **moderate adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✗	Local - Reg	ST-LT	Perm	Med	--	--	-	--

Commentary

Short Term: It is anticipated that low energy costs and travel friendly conditions would lead to a large rise in travel, in particular road based travel, with a consequent large usage of natural resources and production of waste as infrastructure is developed to meet demand. The dispersed nature of settlement also means that distances travelled would generally be higher, with less opportunity for non-motorised movements. It is also anticipated that this scenario would have less compact development of generally lower density and less energy efficiency (buildings as well as transport). Overall it is considered that there would be moderate adverse effects under this scenario.

Medium Term: Low energy costs and travel friendly conditions would continue to lead to a large rise in travel, with a consequent large usage of natural resources (note lower uptake of LZEV is predicted under this scenario) and further production of waste as infrastructure is developed to meet demand. This is anticipated to lead to continued moderate adverse effects.

Long Term: The nature of settlement would continue to be dispersed and would require continued greater levels of resource use in both operation and maintenance, though much of the infrastructure would be constructed by this stage. While uptake of LZEV and smart mobility technology would likely be lower, relative to there would still be an increased amount in use. It is anticipated that effects would be slight adverse.

Overall, it is anticipated that under this scenario there would be **moderate adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✗	Reg-Nat	ST-LT	Perm	Med	--	--	-	--

Commentary

Short Term: Lower energy costs under this scenario will not encourage uptake of public transport and this, along with a lower uptake of LZEVs and smart mobility technology would result likely in moderate adverse effects under this scenario.

Medium Term: Low energy costs would continue to encourage the use of private vehicles. While uptake of LZEVs and smart mobility technology would be lower in this scenario, there would still be some uptake, though there may be issues around affordability. It is anticipated that effects would continue to be moderate adverse.

Long Term: Continued low energy costs would continue to encourage the use of private vehicles. It is anticipated of uptake LZEVs and smart mobility technology will have grown, with issues around affordability potentially lessening as technology matures. It is anticipated that effects would be slight adverse.

Overall, it is anticipated that under this scenario there would be **moderate adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓/✗	Reg-Nat	ST-LT	Perm	High	+/-	+/-	+	+/-

Commentary

Short Term: Dispersed urban areas, with a travel friendly approach may result in less opportunities for co-location of housing and employment. This scenario would perhaps allow commercial transactions through issues such as 'impulse purchases' at for example stations. There may be less of an uptake in e-commerce due to the lower levels of digital connectivity. It is considered effects would be a mix of slight beneficial and slight adverse.

Medium Term: It is anticipated that a mix of slight beneficial and adverse effects would continue through continued opportunities for physical shopping, but with less e-commerce uptake.

Long Term: It is anticipated that slight beneficial effects would develop in the long term through continued opportunities for physical shopping, but with inevitable e-commerce uptake also providing opportunities for commercial transactions.

Overall, it is anticipated that under this scenario there would be a mix of **slight beneficial and slight adverse** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Development of dispersed urban areas would require co-ordination of land use planning alongside strategic transport planning across a large area and likely a number of different authorities and could be considered slight beneficial.

Medium Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Long Term: It is anticipated that coordination of land use and strategic transport planning would develop further as linkages grow and a greater understanding is made of needs under this scenario. This would be considered slight beneficial.

Overall, it is anticipated that effects of this scenario on this ISA Objective would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift for inter-urban areas will have benefits including on road safety, severance and environmental impacts. Access to facilities and services will be improved by new rail connections between urban areas, although local networks are likely to be more car based. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive although this will be to a lesser degree than in scenario 3. A car focused local urban network is likely to have an adverse impact on severance, road safety and environmental impacts.

Medium Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to slightly increase as they make up a greater proportion of vehicles. Disbenefits due to more traffic in dense urban areas are likely to increase.

Long Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to slightly increase as they make up a greater proportion of vehicles. Disbenefits due to more traffic in dense urban areas are likely to increase.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP. Individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift for inter-urban areas will have benefits including on road safety, severance and environmental impacts. Access to facilities and services including healthcare facilities such as hospitals will be improved by new rail connections between urban areas, although local networks are likely to be more car based. Improved technology will also have benefits, such as CAVs improving road safety and accessibility for those who cannot drive although this will be to a lesser degree than in scenario 3. A car focused local urban network is likely to have an adverse impact on severance, road safety and environmental impacts.

Medium Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to slightly increase as they make up a greater proportion of vehicles. Disbenefits due to more traffic in dense urban areas are likely to increase.

Long Term: The benefits from accessibility will increase. Benefits due to CAVs are likely to slightly increase as they make up a greater proportion of vehicles. Disbenefits due to more traffic in dense urban areas are likely to increase.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP. Individual new roads and rail lines should be considered in terms of severance and environmental impacts and any adverse impacts mitigated against.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Improvements to stations and multimodal interchanges will lead to benefits in security and perception of security with better lighting and more CCTV. More people walking and cycling to access public transport will lead to more people on the streets, increasing passive surveillance and perception of security. Mode shift for inter-urban journeys will reduce accidents but a car based local network may increase accidents in dense urban areas.

Medium Term: The benefits from mode shift will increase, as will passive surveillance, although detrimental impacts on road safety due to increased traffic in dense urban areas are also likely to increase.

Long Term: The benefits from mode shift will increase, as will passive surveillance, although detrimental impacts on road safety due to increased traffic in dense urban areas are also likely to increase.

Overall, it is anticipated that under this scenario there would be **slight beneficial** effects from the implementation of the STP.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be both improved rail lines between urban areas and new stations, which will improve access by rail to services and facilities. However, connections within the urban areas are likely to be car-based and so there will be less benefits for public transport users making these movements. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments, however there will be less of an uptake of CVs than in scenario 3. New multimodal interchanges will help to improve multi-stage journeys. These impacts are likely to benefit children and young people accessing educational facilities, older people, disabled people and pregnant women or people with prams/pushchairs.

Medium Term: There are likely to be more improved rail lines in the medium term, as well as more multimodal interchanges and slightly more CAVs, improving accessibility further.

Long Term: There are likely to be more improved rail lines in the long term, as well as more multimodal interchanges and slightly more CAVs, improving accessibility further

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This alternative has low fuel costs, which could lead to more affordable transport for car users This may benefit people living in areas with higher levels of income deprivation. However, this is likely to have less of an impact on train users and bus users, as these are more likely to be electric or hybrid vehicles and there could still be a small impact in costs, which could have an impact on fares.

Medium Term: The impact of low fuel costs may be higher on car users than in the short term.

Long Term: The impact of low fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be more improvements to interchanges and station facilities, which should include improvements to lighting and CCTV, this would reduce crime and fear of crime and promote community safety. An increase in the number of people walking and cycling to public transport on the streets could also provide passive surveillance, and improve the perception of security. Young people, older people, women, disabled people and Black and minority ethnic groups may all benefit more from an improved perception of safety.

Medium Term: More interchanges and station facilities will have improved facilities with the potential for more walking and cycling, and therefore more passive surveillance, improving community safety further.

Long Term: More interchanges and station facilities will have improved facilities with the potential for more walking and cycling, and therefore more passive surveillance, improving community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift for inter-urban trips on the improved rail lines improve road safety and reduce the number of accidents, although the demand for car travel is still predicted to increase. The increase in CAVs could also lead to improvements in road safety, due to less chance for human error. However, the full benefits might not be realised until a higher proportion of vehicles are CAVs, and there are predicted to be less CAVs than in scenario 3. Road improvements in urban areas could also improve road safety, although the more car based trips on the local network could also have a detrimental impact on road safety. These are likely to benefit children, older people, cyclists and pedestrians.

Medium Term: There are likely to be more road improvements in urban areas, resulting in further road safety improvements, although traffic in dense urban areas is likely to have increased further having a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs, and therefore more benefits from them and overall more improved road safety.

Long Term: There are likely to be more road improvements in urban areas, resulting in further road safety improvements, although traffic in dense urban areas is likely to have increased further having a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs, and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/ ✗	Local -Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: There will be inter-urban new rail lines and roads in dense urban areas, which could cause increases in localised severance, and will need to be mitigated individually. The focus on car-based travel for journeys on the local network is likely to increase traffic, and so increase severance. Some mode shift for inter-urban journeys will reduce severance in some areas.

Medium Term: There are likely to be more new rail lines and roads built in this time frame as well as road improvements, which may cause localised severance.

Long Term: There are likely to be more new rail lines and roads built in this time frame as well as road improvements, which may cause localised severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/ ✗	Local -Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: There will be inter-urban new rail lines and roads in dense urban areas, which could cause increases in localised environmental impacts and will need to be mitigated individually. The focus on car-based travel for journeys on the local network is likely to increase traffic, and so worsen environmental impacts. The increase in EVs and hybrids is likely to reduce air and noise pollution, but there will be less EVs/hybrids in this scenario than in scenario 3. A reduction in air, noise and light pollution from transport will be beneficial for children, older people and disabled people, particularly those with respiratory illnesses.

Medium Term: There are likely to be more new rail lines and roads built in this time frame, as well as road improvements that may cause localised environmental impacts. There are likely to be slightly higher benefits from the shift to EVs/hybrid vehicles.

Long Term: There are likely to be more new rail lines and roads built in this time frame, as well as road improvements that may cause localised environmental impacts. There are likely to be slightly higher benefits from the shift to EVs/hybrid vehicles.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be both new and improved rail lines between urban areas and new stations, which will improve access by rail to services and facilities, including healthcare facilities such as hospitals. However, connections within the urban areas are likely to be car-based, consequently there will be fewer benefits for public transport users making these movements. An increase in CAVs may also improve access for people who are not able to drive, including those for medical reasons such as people with visual impairments, however there will be lower uptake of CVs than in scenario 3. New multimodal interchanges will help to improve multi-stage journeys.

Medium Term: There are likely to be more improved rail lines in the medium term, as well as more multimodal interchanges and slightly more CAVs, improving accessibility further.

Long Term: There are likely to be more improved rail lines in the long term, as well as more multimodal interchanges and slightly more CAVs, improving accessibility further

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This alternative has low fuel costs, which could lead to more affordable transport for car users, and although this is likely to have less of an impact on train users and bus users as these are more likely to be electric or hybrid vehicles, there could still be a small impact in costs that could have an impact on fares.

Medium Term: The impact of low fuel costs may be higher on car users than in the short term.

Long Term: The impact of low fuel costs may be higher on car users than in the medium term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be more improvements to interchanges and station facilities, which should include improvements to lighting and CCTV, which would reduce crime and fear of crime and promote community safety. The increased number of people walking and cycling to public transport on the streets could also provide passive surveillance and improve the perception of security.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving community safety further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift for inter-urban trips onto improved rail lines will improve road safety and r the number of accidents, although the demand for car travel is still predicted to increase. The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs, and there are predicted to be less CAVs than in scenario 3. Road improvements in urban areas could also increase road safety, although the more car based trips on the local network could also have a detrimental impact on road safety.

Medium Term: There are likely to be more road improvements in urban areas, resulting in improved road safety, although traffic in dense urban areas is likely to have increased further having a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs and therefore increased benefits from them, and overall more improved road safety.

Long Term: There are likely to be more road improvements in urban areas, resulting in improved road safety, although traffic in dense urban areas is likely to have increased further having a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs and therefore increased benefits from them, and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/ ✗	Local -Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: There will be inter-urban new rail lines and roads in dense urban areas, which could cause increases in localised severance and will need to be mitigated individually. The focus on car-based travel for journeys on the local network is likely to increase traffic and so worsen severance. Some mode shift for inter-urban journeys will reduce severance in some areas.

Medium Term: There are likely to be more new rail lines and roads built in this time frame as well as road improvements, which may cause localised severance.

Long Term: There are likely to be more new rail lines and roads built in this time frame as well as road improvements, which may cause localised severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential severance mitigated.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/ ✗	Local -Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: There will be inter-urban new rail lines and roads in dense urban areas that could cause increases in localised environmental impacts, which will need to be mitigated individually. The focus on car-based travel for journeys on the local network is likely to increase traffic, and consequently worsen environmental impacts. The increase in EVs and hybrids is likely to reduce air and noise pollution, but there will be less EVs and hybrids in this scenario than in scenario 3.

Medium Term: There are likely to be more new rail lines and roads built in this time frame, as well as road improvements that may cause localised environmental impacts. There are likely to be slightly higher benefits from the shift to EVs/hybrid vehicles.

Long Term: There are likely to be more new rail lines and roads built in this time frame, as well as road improvements that may cause localised environmental impacts. There are likely to be slightly higher benefits from the shift to EVs/hybrid vehicles.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New roads and rail lines should be considered individually and any potential environmental effects mitigated.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Mode shift from car to the inter-urban trips on the improved rail lines, will improve road safety and reduce the number of accidents. Although the demand for car travel is still predicted to increase. The increase in CAVs could also lead to improvements in road safety due to less chance for human error, although the full benefits might not be realised until a higher proportion of vehicles are CAVs and there are predicted to be less CAVs than in scenario 3. The road improvements in urban areas could also improve road safety, although the more car based trips on the local network could also have a detrimental impact on road safety.

Medium Term: There are likely to be more road improvements in urban areas, resulting in more enhanced road safety. Although traffic in dense urban areas is likely to have increased further, with a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs, and therefore more benefits from them and overall more improved road safety.

Long Term: There are likely to be more road improvements in urban areas, resulting in more enhanced road safety. Although traffic in dense urban areas is likely to have increased further, with a detrimental impact on road safety. There is likely to be a slightly higher proportion of CAVs, and therefore more benefits from them and overall more improved road safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There will be more improvements to interchanges and station facilities than in Scenario 1, which should include improvements to lighting and CCTV This is likely to reduce crime and fear of crime and improve security issues. The increased number of people on the streets due to higher levels of walking and cycling could also provide passive surveillance, improving the perception of security.

Medium Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety and security further.

Long Term: More interchanges and station facilities will have improved facilities and there is potential for more walking and cycling and therefore more passive surveillance, improving safety and security further.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

Appendix G. Assessment of Strategic Components

Table G-1 Assessment Tables Key

Terms		Effects					Assessment	
		Mag	Scale	Dur	T/P	Cert	Scale	Category
Mag	Magnitude	✓✓	Local	ST-MT	Temp	Low	**+++**	Large beneficial
Scale	Geographic Extent	✓	Local-Reg	ST-LT	Perm	Med	**++**	Moderate beneficial
Dur	Duration	-	Reg-Nat	MT-LT		High	**+**	Slight beneficial
T/P	Temporary / Permanent	?		ST			**0**	Neutral
Cert	Certainty	✗		MT			**-**	Slight adverse
ST	Short Term	✗✗		LT			**--**	Moderate adverse
MT	Medium Term						**---**	Strong adverse
LT	Long Term						**?**	Uncertain
Sm	Summary assessment						**+/-**	Combination of beneficial and adverse

G.1. Assessment Rationale

Table G-2 Assessment of Strategic Components – Assessment Rationale

ISA Objective / Key Assumptions
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport
• New road links likely to lead to overall increase in road travel kilometres, resulting in overall increase in operational GHG emissions, as well as GHG emissions during construction (construction activities and embodied in materials and equipment). Changes in operational emissions would also be affected by changes in average speeds. • Road infrastructure improvements can lead to reduced congestion or changes in traffic patterns, through removal of pinch points, carriageway widening, junction improvements, etc. This would likely lead to a decrease in GHG emissions, though this gain can be offset by an increase in travel kilometres as a greater volume of traffic may be attracted to the improved route. • Park and ride interventions would typically lead to beneficial effects overall as they encourage shorter car journeys and reduce congestion, though they may increase GHG emissions in the immediate vicinity of park and ride sites. • Continuing uptake of low/zero emission vehicles (LZEVs), encouraged by expansion of LZEV support infrastructure, would gradually reduce overall GHG emissions per road travel kilometre, substantially below current levels. • Rail link interventions would typically result in lower overall emissions per travel kilometre if involving a modal shift from road movement and the latter is dominated by fossil fuelled vehicles, though new rail lines would entail emissions during construction as well as introducing new emissions to areas not previously effected by train emissions. • Increased modal shift to rail movement (passenger and/or goods) should lead to an overall reduction in GHG emissions per travel kilometre. The greater the proportion of rail movement by electric powered trains the greater the reduction in GHG emissions per travel kilometre. Rail infrastructure improvements, including station upgrades, would make rail movement more attractive, thereby encouraging modal shift to rail. Greater integration of rail station facilities with other public transport modes and water/marine transport facilities, as well as improving walking and cycling accessibility, would enhance the attractiveness of multi-modal non-private vehicle movement, leading to lower GHG emissions per travel kilometre as long as fossil-fuelled vehicles dominate private vehicle movement. • Inland or coastal port upgrades would allow the diversion of freight from road and rail networks. This would likely result in an overall reduction in GHG emissions per freight tonne travel kilometre, though this would be offset to some extent by emissions resulting from construction. • Use of inland waterways would allow the diversion of freight from road and rail networks. This would likely result in an overall reduction in GHG emissions per freight tonne travel kilometre. • Uptake/expansion of Connected and Autonomous Vehicles (CAVs) and other road based smart mobility technology (passenger and goods) use would be likely to reduce congestion as well as overall road travel kilometres, and associated air pollutant emissions. • Uptake of digital connectivity as an alternative to physical travel would be likely to reduce congestion as well as overall road and rail travel kilometres, and associated air pollutant emissions.
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network
• New road infrastructure can lead to direct loss, encroachment onto and/or the severance / fragmentation of sites of ecological or geological value, important habitats and green infrastructure assets. Fauna can also be lost through the development of, or improvements to, road infrastructure. Negative effects on biodiversity can also result from increased noise levels, vibration, air, water and light pollution, as well greater disturbance impacts from an increased proximity to (and volume of) human activity. • Improvements to road infrastructure such as removing pinch points, carriageway widening, junction improvements can lead to the encroachment onto and/or fragmentation of existing habitats and green infrastructure assets, or lead to direct loss of habitat. • Uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, is anticipated to reduce negative effects on biodiversity from noise, air and water pollution. • Effects on biodiversity from development of LZEV support infrastructure is anticipated to be limited. • New rail links, including new stations/interchanges, could lead to direct loss, encroachment onto and/or the severance / fragmentation of sites of ecological and geological value, as well as important habitats and green infrastructure assets. Fauna could also be lost through the development of new rail links, stations and interchanges. Negative effects on populations of notable and/or protected species can also result from increased disturbance from noise, vibration and light. • Potential adverse effects could be expected on biodiversity along rail infrastructure corridors as a result of potential land required for increased track capacity and/or rail electrification. • Loss of green infrastructure including trees and other vegetation due to a requirement for embankment safety is another issue. Negative effects from air and water pollution may reduce as rail electrification is implemented. • Effects on biodiversity from station improvements are anticipated to be limited as facilities are already existing and within urban areas for the most part. Direct loss or encroachment onto designated sites and important habitats is likely to be limited. These areas are also likely to be already subject to some existing level of disturbance from noise/vibration/light. • Expansion and/or improvements to marine ports and/or inland waterways could lead to biodiversity/habitat loss or degradation.

• Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) use would be likely to reduce congestion as well as overall road travel kilometres. These outcomes would be anticipated to have potential benefits for biodiversity, by improving air and water quality. • Uptake of digital connectivity as an alternative to physical travel would be likely to reduce congestion as well as overall road and rail travel kilometres. These outcomes would be anticipated to have potential benefits for biodiversity, by improving air and water quality.
3. Conserve and enhance the international sites (HRA specific objective)
• New and improved road and rail infrastructure, expansion and/or improvements on land or to marine ports can lead to direct loss, encroachment onto and/or the severance/fragmentation of international sites (SPAs, pSPAs, SACs, cSACs, pSACs and Ramsar sites) that are designated for their importance to nature conservation. Negative effects on international sites can also result from disturbance (e.g. increased noise levels, vibration, air, water and light pollution, as well as the presence and volume of human activity. • Uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, CAVs and other road based smart mobility technology (passenger and goods) use, introduction of rail electrification and update of digital connectivity is anticipated to reduce negative effects from noise, air and water pollution on international sites. • Effects on international sites from station improvements are anticipated to be limited as facilities are already existing and within urban areas for the most part. Direct loss or encroachment onto international sites is likely to be limited. These areas are also likely to be already subject to some existing level of disturbance from noise/vibration/light.
4. Protect and enhance air quality
• New road links are likely to lead to overall increase in road travel kilometres, potentially resulting in increases in local air pollutant concentrations at certain locations along routes, depending on flow characteristics and proportion of fossil fuelled vehicles. Air pollutant emissions would also occur during construction, potentially contributing to increased localised concentrations. • Road improvements can lead to reduced congestion or changes in traffic patterns, through removal of pinch points, carriageway widening, junction improvements, etc. This would likely lead to a decrease in air pollutant emissions per travel kilometre, though overall reductions can be offset by an increase in travel kilometres as greater volumes of traffic may be attracted to improved routes. • Park and ride interventions would typically lead to beneficial effects overall as they encourage shorter car journeys and reduce congestion, though they may increase air pollution in the immediate vicinity of park and ride sites. • Continuing uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, would be likely to gradually reduce overall air pollutant emissions per road travel kilometre, substantially below current levels. • Rail link interventions would typically result in lower overall emissions per travel kilometre if involving a modal shift from road movement and the latter is dominated by fossil fuelled vehicles, though new rail lines would entail emissions during construction as well as introducing new emissions to areas not previously effected by train emissions. • Increased modal shift to rail movement (passenger and/or goods) should lead to an overall reduction in air pollutant emissions per travel kilometre. The greater the proportion of rail movement by electric powered trains the greater the reduction in air pollutant emissions per travel kilometre. Rail infrastructure improvements, including station upgrades, would make rail movement more attractive, thereby encouraging modal shift to rail. Greater integration of rail station facilities with other public transport modes and water/marine transport facilities, as well as improving walking and cycling accessibility, would enhance the attractiveness of multi-modal non-private vehicle movement, leading to lower air pollutant emissions per travel kilometre as long as fossil-fuelled vehicles dominate private vehicle movement. • Inland or coastal port upgrades would allow the diversion of freight from road and rail networks. This would likely result in an overall reduction in air pollutant emissions per freight tonne travel kilometre. • Use of inland waterways would encourage diversion of freight from road and rail networks. This would likely result in an overall reduction in air pollutant emissions per freight tonne travel kilometre, though this would be offset to some extent by emissions resulting from construction. • Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) use would be likely to reduce congestion as well as overall road travel kilometres (for a given demand), and associated air pollutant emissions. • Uptake of digital connectivity as an alternative to physical travel would be likely to reduce congestion as well as overall road and rail travel kilometres, and associated air pollutant emissions.
5. Increase resilience of the transport network to extreme weather events and a changing climate
• New road links would likely result in an increase in impermeable areas and/or changes to topography, vegetation cover, etc., potentially leading to increased flood risk due to changes to local drainage patterns. Road links may be located within flood zones which could lead to risk of flooding. • Road infrastructure improvements could result in an increase in impermeable surface areas and/or changes to topography, vegetation cover, etc., potentially leading to increased flood risk due to changes to local drainage patterns. Road infrastructure improvements may be located within flood zones which could lead to risk of flooding. • In so far as it increases reliance on electrical infrastructure, continuing uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, may reduce resilience. • New rail links could cause minor increases in impermeable surfaces and/or changes to topography, vegetation cover, etc, potentially leading to increased flood risk due to changes to local drainage patterns as well as affecting flood zones.

- Rail infrastructure improvements could potentially lead to protection measures or flood plain alleviation measures being implemented.
- Rail station and interchange works, and station upgrades could provide the opportunity for the installation of SuDS features such as green roofs, permeable paving, swales, etc to help manage local drainage patterns and reduce flood risk.
- Rail infrastructure may be more likely to be vulnerable, compared to road infrastructure, to disruptive effects from climate change, in terms of storm events, temperature extremes and flooding, due to the variety of key assets (track, bridges, signalling, switches/crossing, overhead line and trackside equipment, stations) which may be affected.
- The use of inland waterways could potentially contribute to increased run-off leading to an increased flood risk.
- Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) use would be likely to reduce overall road use (for a given demand), which would reduce pressures on the road network and hence enhance resilience. Increasing reliance on electrical infrastructure for smart mobility interventions may reduce resilience.
- Uptake of digital connectivity as an alternative to physical travel would be likely to reduce pressures on the road network and hence enhance resilience.

6. Protect and enhance the inland and coastal water environment

- New road links would result in an increase in impermeable areas, potentially leading to increased contaminated surface water runoff. Pollution incidents may also occur both during construction and as a result of accidents when operational.
- Road infrastructure improvements could result in an increase in impermeable areas, potentially leading to an increase in contaminated surface water runoff. Improved road infrastructure may also reduce the potential for accidents that could lead to pollution.
- Continuing uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, would be likely to contribute to reduction in polluted run-off from roads, thus benefiting this ISA Objective.
- New rail links may lead to additional polluted runoff, though areas of impermeable surfacing likely to be relatively minor compared to roads. Potential for pollution incidents during construction, e.g. likely to be works required over or adjacent to watercourses.
- Rail infrastructure improvements may lead to addition polluted runoff. Areas of impermeable surfacing likely to remain constant.
- Rail station and interchange upgrades would likely be for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case).
- In so far as they contribute to a reduction in overall road use (for a given demand), uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods), as well as uptake of digital connectivity as an alternative to physical travel, may lead to reduced negative effects on the water environment, in particular inland waterways.
- Increased use of coastal and inland waterways for transport are likely to lead to potential pollution, both directly from vessels and from associated landside activities.

7. Protect and conserve soil and remediate / avoid land contamination

- New road links and other road infrastructure improvements could potentially result in direct loss and/or encroachment on higher value agricultural lands in greenfield areas, with negative effects on soils. Potential contamination of new areas may also occur due to accidental pollution incidents or road run-off. By contrast, road interventions in brownfield areas could provide opportunities to remediate contaminated land, including the removal of invasive species.
- Continuing uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, would be likely to contribute to reduction in polluted run-off from roads, thus benefiting this ISA Objective.
- New rail links and rail infrastructure improvements could potentially result in direct loss and/or encroachment on higher value agricultural lands in greenfield areas, with negative effects on soils. Potential contamination of new areas may also occur due to accidental pollution incidents or road run-off. By contrast, rail interventions in brownfield areas could provide opportunities to remediate contaminated land, including the removal of invasive species.
- Rail station and interchange works, and station upgrades, could provide an opportunity for remediation of contaminated land and the removal of invasive species.
- In so far as they contribute to a reduction in overall road use (for a given demand), uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods), as well as uptake of digital connectivity as an alternative to physical travel, may lead to reduced negative effects on soils. However, development of supporting smart mobility infrastructure may result in some negative effects.
- Inland and coastal water transport facility expansion/upgrade could involve works such as large scale earth movements which could potentially have negative effects on soil and agricultural resources. Opportunities may also be available for remediation of contaminated land and the removal of invasive species.

8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage

- New road infrastructure may have a detrimental effect on the character and setting of heritage assets and therefore impact on their quality and distinctiveness. Construction of infrastructure also has the potential for previously unknown heritage features to be disturbed or damaged.

- Road infrastructure improvements may have a detrimental effect on the character and setting of heritage assets and therefore impact on their quality and distinctiveness. However, junction improvements, removal of pinch points, etc may also provide an opportunity for improvement, particularly in relation to heritage features located in the townscape, where congestion may be reduced.
- Uptake of LZEVs should benefit this ISA Objective, with reduced noise and pollution emissions over the road network. However, development of LZEV charging networks may result in some negative effects. As locations for charging infrastructure are most often in fleet depots, service stations, car parks and on-street parking bays, effects on heritage assets are likely to be minimal.
- New rail links could have a detrimental effect on the quality and distinctiveness of heritage assets, although in many case negative effects may be less than that of road links, due to smaller overall land take and intermittence of train movements. Construction could also lead to the damage or disturbance of previously unknown features.
- Rail infrastructure improvements could have a detrimental effect on the quality and distinctiveness of heritage assets, e.g. through the construction of new infrastructure such as overhead electrification. However, infrastructure improvements may also provide opportunities for enhancement, e.g. to railway heritage features. Lower noise and air pollution levels may also benefit heritage assets. There is always a potential for unknown heritage features to be discovered or damaged during construction.
- Rail station and interchange upgrades could provide the opportunity for the enhancement of railway heritage features, e.g. at the historic Manchester Piccadilly station.
- As inland and coastal water transport facility expansion/upgrade could would typically be in existing ports or developed areas effects on heritage assets are likely to be minimal. However, effects on industrial heritage areas may be more marked, with potential for improvement. There may also be opportunities for rejuvenation of historic assets.
- In so far as they contribute to a reduction in overall road use (for a given demand), uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods), as well as uptake of digital connectivity as an alternative to physical travel, may lead to reduced negative effects on heritage assets, particularly in relation to noise and air pollution. However, development of supporting smart mobility infrastructure may result in some negative effects.

9. Protect and enhance the character and quality of landscapes and townscapes

- New road infrastructure (particularly new roads) can have potential detrimental effects if located in or near areas of higher landscape/townscape quality or character. Effects on landscape character/quality may be reduced in already developed, more urban areas, though here roads can encroach on areas identified as open space / recreation. In some circumstances, however, there may be opportunities for enhancement, for example where road infrastructure forms part of well-planned urban regeneration or is located on helps with improvement of derelict sites.
- Road infrastructure improvements have the potential for negative effects if located in or near areas of higher landscape/townscape quality or character. Junction improvements, removal of pinch points, etc provide an opportunity for improvement, particularly in relation to townscape.
- Uptake of LZEVs should benefit this ISA Objective, with reduced noise and pollution emissions over the road network. However, development of LZEV charging networks may result in some negative effects. As locations for charging infrastructure are most often in fleet depots, service stations, car parks and on-street parking bays, effects on landscape/townscape character and quality are likely to be minimal.
- New rail links can have potential detrimental effect if located in or near areas of higher landscape/townscape quality or character. Negative effects on landscape would be reduced in already developed, more urban areas, though in these areas they would potentially involve encroachment on areas identified as open / recreational space.
- Rail infrastructure improvements may have detrimental effects on landscape / townscape due, for example, to widening of corridors, increase in infrastructure height, e.g. through electrification. Opportunities for additional screening may also be presented, however.
- Rail station and interchange upgrades could enhance landscape / townscape character or quality by enhancing the public realm. However, depending on location and design, negative effects could also result.
- Inland and coastal water transport facility expansion/upgrade may introduce significant new features in the landscape/townscape, which could lead to negative effects. However, depending on location and design, there could also be opportunities for enhancement, e.g. as part of well-planned regeneration of port facilities.
- In so far as they contribute to a reduction in overall road use (for a given demand), uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods), as well as uptake of digital connectivity as an alternative to physical travel, may lead to reduced negative effects on landscape/townscape quality and character, particularly in relation to noise and air pollution. However, development of supporting smart mobility infrastructure may result in some negative effects.

10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling

- The construction of new road links is likely to result in requirements for additional resources and increased waste production. Opportunities are likely to be presented for using recycled materials, in particular pavement and structural materials, e.g. for bridges, culverts, etc., as well as reusing and/or recycling waste materials, during and after construction. In general, volumes of materials involved in road construction are considerably greater than those for rail, per km of new route.
- Road infrastructure improvements could potentially result in requirements for additional resources and increased waste production. Opportunities are likely to be presented for using recycled materials, as well as reusing and/or recycling waste materials, during and after construction.
- Uptake of LZEVs should benefit this ISA Objective, with reduced need for fossil fuel service stations and supporting infrastructure. However, electrical/electronic waste would increase, in particular electric batteries. The hazardous nature of some of this waste, and its complex composition, would require expansion of specialist electrical/electronic waste management facilities. Opportunities for reuse and recycling of this type of waste are likely to increase due to enhancements in manufacturing processes and waste recovery technology.

- The construction of new rail links, rail station and interchange upgrades could potentially result in requirements for additional resources and increased waste production. Opportunities are likely to be presented for using recycled materials, as well as reusing and/or recycling waste materials, during and after construction.
- Inland and coastal water transport facility expansion/upgrade is likely to result in requirements for additional resources and increased waste production. Opportunities are likely to be presented for using recycled materials, as well as reusing and/or recycling waste materials, during and after construction.
- In so far as they contribute to a reduction in overall road use (for a given demand), uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods), as well as uptake of digital connectivity as an alternative to physical travel, may lead to reduced requirements for additional resources and lower waste production. Development of supporting smart mobility infrastructure is likely to result in relatively low resource requirements and waste production. Opportunities are likely to be presented for using recycled materials, as well as reusing and/or recycling waste materials, during and after construction of such facilities.

11. Enhance lower carbon, affordable transport choice

- New road links, particularly new roads, would have the potential to increase car use and movement of goods by road. Private fossil-fuelled road vehicles (passenger and goods) represent a higher carbon and less affordable transport choice, compared to rail transport per travel kilometre. Public buses also use roads, representing a lower carbon and more affordable transport choice compared to private fossil-fuelled car use, though generally higher carbon than rail transport per travel kilometre.
- Road infrastructure improvements could encourage increased car use and movement of goods by road (for a given level of demand) due to improvements in flow and journey times, with similar, though likely lesser, effects on low carbon, affordable transport choice as those from new road links.
- Uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, is likely to substantially reduce GHG emissions per road travel kilometre, thus enhancing lower carbon transport choice. However, effects on affordability are less certain and may be minimal.
- New rail links should provide lower carbon (per travel kilometre) transport choice compared to road transport. However, depending on financing models and pricing strategies, new rail links may result in transport choice that may be more, or less, affordable than road transport.
- Rail infrastructure improvements, station upgrades, and station and interchange works, by improving the attractiveness of rail transport, could result in enhancing lower carbon transport choice. Affordability effects would be likely to be similar to those for new rail links. Effects on transport choice for movement of goods are likely to be limited compared to those for passenger movement.
- Inland and coastal water transport facility expansion/upgrade could result in enhancement to lower carbon, affordable transport choice, most particularly for movement of goods, depending on financing models and pricing strategies used.
- Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) is likely to lead more efficient use of road transport infrastructure and vehicles, potentially resulting in enhanced lower carbon, affordable transport choice.
- Uptake of digital connectivity as an alternative to physical travel, by reducing overall travel demand, may contribute to inhibiting development of lower carbon, affordable transport, thus resulting in negative effects on this ISA Objective.

12. Enhance long term economic prosperity and promote economic transformation

- New road links would lead to construction employment opportunities, though limited to the construction phase. New road links should lead to improved accessibility to existing and planned employment areas and transport hubs, helping to facilitate overall connectivity, including faster journey times, less congestion and higher quality travel, thus supporting enhanced economic activity.
- Road infrastructure improvements are likely to have similar overall beneficial effects on this ISA Objective to those of new road links, although effects may be less marked overall in some cases, particularly in terms of construction activity.
- Uptake of LZEVs, encouraged by expansion of LZEV support infrastructure, is likely to benefit this ISA Objective with expansion of LZEV technology related economic activity, which may outweigh potential decline in fossil fuelled vehicle technology related activity.
- New rail links would lead to construction employment opportunities, though limited to the construction phase. New rail links should lead to improved accessibility to existing and planned employment centres and other transport hubs, helping to facilitate overall connectivity, including faster journey times and greater capacity, reliability and quality of rail services, thus supporting enhanced economic activity.
- Rail infrastructure improvements, station upgrades, and station and interchange works, are likely to have similar overall beneficial effects on this ISA Objective to those of new rail links, although effects may be less marked overall in some cases, particularly in terms of construction activity. Improvements to stations may also lead to enhancement of economic activity within the station and its surrounding area, in particular if coordinated with other adjacent commercial development such as retail outlets and office facilities based on Transit Oriented Development principles.
- Expansion/upgrade of inland and coastal water transport facilities would be likely to have similar benefits to that of rail improvements, though more focused on goods movement, particularly if well coordinated and integrated with existing and planned development of other modes.
- Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) is likely to lead more efficient use of road transport infrastructure and vehicles, which may also result in associated economic efficiency, thus benefiting this ISA Objective.

• Uptake of digital connectivity as an alternative to physical travel, by reducing overall travel demand, may also contribute to overall enhancements in economic efficiency, thus benefiting this ISA Objective. Although it may also result in reduced economic activity in the transport sector due to potential demand reduction.
13. Coordinate land use and strategic transport planning across the region
• The effectiveness and efficiency of development of road, rail and water transport infrastructure, both in terms of new links and infrastructure improvements, increasingly requires coordination and integration with land use planning beyond individual schemes, at the programme (multi-scheme) level or higher. The degree to which proposed interventions have been set within a wider planning context, and form part of an integrated, fully coordinated multi-modal strategy closely linked to sustainable economic and social objectives, is the key measure by which benefits for this ISA Objective should be evaluated. The level of complimentary of proposed interventions across all transport modes, and their alignment with strategic economic and land use planning, are key features contributing to benefits to this ISA Objective. • Uptake of LZEVs is likely to lead to substantial changes in power demand and generation patterns, which will need to be increasingly integrated across both land use and transport to manage peaks and maximise efficiency. This is likely to benefit this ISA Objective. • Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) may lead to closer integration of transport and urban planning as quantity, quality and availability of digital information on vehicle movement, both passenger and freight, integrated with a host of other urban system digital information, enables increasingly advanced tools both in planning and managing urban environments as well as transport networks. • Uptake of digital connectivity as an alternative to physical travel, by reducing overall travel demand and blurring the economic advantages of locational proximity, may lead to a declining focus on land use and strategic transport planning, thus resulting in adverse effects for this ISA Objective.
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)
• New road links and infrastructure improvements are likely to primarily benefit car users in terms of equality of opportunity, though some benefits will also be likely for bus and taxi users. Access to employment opportunities, public services, recreational and leisure facilities could potentially be enhanced. • To the extent it may reduce total cost of ownership, in particular in relation to fuel costs, uptake of LZEVs may result in some benefits for this ISA Objective. • Provision of new rail links and rail infrastructure improvements could potentially benefit a wide range of social groups, with enhanced accessibility to employment opportunities, public services, recreational and leisure facilities encouraged by improved quality, frequency, safety, reliability and affordability of rail services. • Station and interchange works could promote greater equality for all the citizens resulting from better access to urban centre facilities, alongside more comfortable stations. • Expansion/upgrade of inland and coastal water transport facilities may have some benefits for this ISA Objective, particularly if well coordinated and integrated with existing and planned development of other modes, although benefits likely to be relatively minor. • Uptake/expansion of CAVs and other road based smart mobility technology may lead to greater availability of more flexible, convenient, safe and affordable road based mobility services, enhancing accessibility across a wide range of social groups and thus benefiting this ISA Objective. • Uptake of digital connectivity as an alternative to physical travel, by enhancing virtual accessibility to employment opportunities, public services, recreational and leisure facilities across a wide range of social groups is likely to result in benefits for this ISA Objective. • Affordability – transport options priced in line with existing services. • Accessibility improvements widen the transport network, rather than simply duplicate services. • Rail and other modes of public transport result in less vibration, air and noise pollution than cars. • It is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants. • General assumption – schemes will be appraised to ensure they do not negatively impact on communities (where possible), i.e. that schemes are logically and sensitively placed. • Accessible design practices and standards (i.e. service provision, station design, access to information in a variety of formats etc.). • Safety measures fundamental to scheme/policy design, i.e. lighting, CCTV, etc.
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)
• New road links and road infrastructure improvements could potentially have detrimental effects on health and well-being with the chance of accidents during construction and maintenance. There could also be an increase in pollutant levels and the potential for disturbance through noise and vibration. Issues such as light pollution and community severance could also impact on health and well-being. However, in so far as new/improved road infrastructure may reduce congestion, driver stress and incidence of traffic accidents, and improve the overall environment and accessibility, particularly to health care services, there may also be benefits for this ISA Objective. • Continuing uptake of LZEVs, would be likely to gradually reduce overall air pollutant emissions per road travel kilometre, as well as overall road noise levels, with associated benefits for health and well-being.

- New rail links and rail infrastructure improvements could potentially result in accidents during construction, as well as potentially leading to increased pollutant levels and disturbance through noise and vibration. However, in so far as they lead to modal shift from road to rail, the lower pollution, noise and disturbance associate with rail transport, per travel kilometre, there may be benefits for this ISA Objective. Additionally, greater accessibility, shorter journeys, more frequent, reliable and higher quality rail services may also lead to benefits for this ISA Objective.
- To the extent rail station upgrades, station and interchange works contribute to increased availability of overall benefits of rail travel to a wider range of social groups, and encouraging modal shift from road to rail, there may be benefits to this ISA Objective.
- Expansion/upgrade of inland and coastal water transport facilities may increase the diversion of freight from road and rail networks which could help to reduce overall air emissions as well as disturbance from noise and vibration, with benefits to health and well-being.
- Uptake/expansion of CAVs and other road based smart mobility technology (passenger and goods) use would be likely to reduce congestion as well as overall road travel kilometres (for a given demand), and associated pollutant emissions and noise levels, with benefits for this ISA Objective.
- Affordability – transport options priced in line with existing services.
- Accessibility improvements widen the transport network, rather than simply duplicate services.
- Rail and other modes of public transport result in less vibration, air and noise pollution than cars.
- It is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.
- General assumption – schemes will be appraised to ensure they do not negatively impact on communities (where possible), i.e. that schemes are logically and sensitively placed.
- Accessible design practices and standards (i.e. service provision, station design, access to information in a variety of formats, etc.).
- Safety measures fundamental to scheme/policy design, i.e. lighting, CCTV, etc.
- Schemes will be appraised to ensure they do not negatively impact on communities (where possible), i.e. that schemes are logically and sensitively placed.
- Uptake of digital connectivity as an alternative to physical travel would be likely to reduce congestion as well as overall road and rail travel kilometres, and associated pollutant emissions and noise levels, with benefits for health and well-being.

16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)

- Schemes will be appraised to ensure they do not negatively impact on communities (where possible), i.e. that schemes are logically and sensitively placed.
- Accessible design practices and standards (i.e. service provision, station design, access to information in a variety of formats etc.).
- Safety measures fundamental to scheme/policy design, i.e. lighting, CCTV, etc.

G.2. Assessment of Strategic Component – Connecting People

Table G-3 Strategic Component: Connecting People – Description and Key Assumptions

Strategy Component: Connecting People
Connectivity between the North's economic centres and assets The North's transport system needs to be accessible, resilient, safe, and accommodating for the free-flowing movement of people for work, business, or leisure. Better transport links make jobs more accessible. For an employee seeking work, better links increase the number and range of jobs available. For an employer, better connectivity increases the number of potential workers it can hire and the range of its labour market. Additionally, not all the North's economic centres are in the largest towns and cities, so a nuanced approach is required to ensure the skills and jobs can reach the labour markets they require. Employers in the North draw workers from smaller areas than those in the South. In 2011, almost 500,000 commuters travelled over 30km to work in London – double the number who commute that distance across all six major city regions in the North. This limited reach of labour markets means that Northern workers have fewer job opportunities, and Northern employers have much smaller labour markets. This is holding back wages and productivity and makes the North a less attractive place for businesses. A relatively small proportion of the North's population commutes by rail. This is due to factors such as the cost, convenience and perception of the rail network, as well as capacity constraints on both intra and inter-urban rail services. There is an increasing demand for rail travel between and within economic centres. Many journeys between Northern economic centres are slow – both in absolute terms and compared with journeys to and from London. Services are also infrequent and there are also significant capacity constraints on both intra and interurban rail services. People and businesses also want faster, frequent, reliable services to access the North's ports and airports. These surface access improvements, alongside additional direct air connections, will support an increase in capacity and demand. In turn, the surface access improvements to airports can then stimulate growth around airports, making them more attractive places to invest and do business. This includes Manchester Airport, which could benefit from HS2 and Northern Powerhouse Rail services. With the transport network playing a fundamental role across society, it is important that all members of society feel able to use the network with confidence. As such, issues such as affordability, security, and physical access, as well as ease of understanding of how best to navigate the system and ease of use, are of crucial importance. Improvements to the journey experience, such as through smart ticketing, is one such measure which can support this. **Multi-modal connectivity improvements** For rail users, multi-modal travel needs to become easier. The overall journey experience is an important factor in each passenger's decision to use rail, so it's important to provide a journey experience that can encourage passengers to choose rail over their car for shorter and longer journeys. To improve journeys for people, enhance onward connectivity, and offer greater choice, opportunities for interchanges between modes of travel need to be improved. For example, the North needs more enhanced interchanges at railway stations and strategic park and ride facilities for multi-modal journeys to better connect the road and rail networks. Improved interchanges and onward travel options for the HS2 and Northern Powerhouse Rail networks will also be required to ensure people benefit from proximity to high-quality links across the UK. At a local level, improvements can also be made to connect bus and cycling provision with the wider transport network. People should be able to have a seamless travel experience, including improved ticketing and better journey information. Currently, integration is poor and information and ticketing systems are fragmented and complex. This improved travel experience should be possible not just on pan-Northern routes, but also at a local level, including on buses and light rail. **Delivering nationally significant infrastructure projects, major employment and major local development approvals** Transport investment can stimulate other investment. This can be residential, commercial and industrial. Road and rail will continue to play a significant role in the movement of materials to support the construction industry in delivering housing growth, as well as the transport infrastructure itself. For those seeking employment, transport projects require more skilled labour across the North to construct them. This can support good growth, whereby new homes can be built for people to live, work and learn, and businesses expand and create more jobs. HS2 can and is unleashing development. Growth strategies are under development centred on the North's future HS2 hubs, including Crewe, Manchester Piccadilly, Manchester Airport, Leeds and Sheffield. Investment in the transport network does need to be on the scale of HS2 to stimulate growth and change the spatial planning dynamic, and there are opportunities for the Strategic Transport Plan to support this change across the North. The strategic transport network needs investment across all modes to create the access to labour markets. TfN can help to promote and stimulate this investment at a regional and local level.

Strategy Component: Connecting People
Cross border connectivity with the North's economic neighbours Access to opportunities should not be limited by administrative boundaries: the North's functional economic geographies go beyond its borders. The transport network needs to support the movement of people within and beyond the North. The Major Roads Network and the rail network play a critical role in realising the economic potential of our border areas and of our neighbours, by moving goods and labour across the borders every day. The North also facilitates the through movement of people. There are existing strong economic relationships with the North's adjacent regions, with the most notable movements, including North Wales - Cheshire and Warrington, and the Liverpool City Region; Scotland - Cumbria and the North East; East Midlands – Hull and Humber and the Sheffield City Region; West Midlands – Cheshire and Warrington, Greater Manchester and Liverpool City Region. TfN is working collaboratively with Midlands Connect, Transport Scotland and the Welsh Government. **Supporting the international connectivity of the North** The North of England received around 30 million visitors in 2016, indicating the scale and popularity of its tourist offer. As an estimate of the economic impact of tourism, the Northern Powerhouse Independent Economic Review identified that there are around 600,000 jobs (8% of the North's total) in the accommodation and recreation, and food and beverages sectors. These sectors' current GVA is nearly £12 billion, around 5% of the North's total GVA. Harnessing this strength will require investment in developing easy and accessible transport connections to enable visitors and residents to access Northern gateways. By 2050, there is potential for the North to have 75 million air passengers per year, compared with 42 million in 2017, with all air freight being able to fly from the North's airports, compared with just 4% in 2016. Ultimately, if more passengers can access the North's airports by road and rail within a 1 to 2 hour catchment, then more airlines will open new European and Intercontinental services from the North's airports.
Key Assumptions *There is a full range of interventions possible under this strategic component. These are:* ***Highways*** • *New highway links* • *Highway infrastructure improvements* • *Smart highways / adaptive network* ***Railways*** • *New rail links* • *Rail infrastructure improvements* • *Station upgrades* ***Public transport (excl. rail)*** • *Park and ride schemes* • *Station and Interchange works* ***Enabling infrastructure*** • *EV facilitating* • *Smart / adaptive roads* • *Digital connectivity* ***Waterways*** • *Inland and coastal port upgrades* • *Use of canals*

Table G-4 Assessment of Strategic Components: Connecting People

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓/✗	Local-Reg	ST-LT	Perm	Med	--	+	+	-

Commentary

Short Term: Implementation of this Strategic Component will involve the development of the full range of transport interventions, some of which are likely to have adverse effects on GHG emissions – in both construction and operation. However, a key element to this Strategic Component is 'Multi-Modal Connectivity Improvements' where there is recognition within this Policy that there is a need to encourage passengers to choose rail over their car for shorter and longer journeys. This would typically result in lower overall emissions per travel kilometre. There is a recognition that opportunities for interchanges between modes need to be improved, along with the interchanges themselves, e.g. more enhanced interchanges at railway stations and strategic park and ride facilities. It is also recognised that improvements can also be made at a local level to connect bus and cycle provision with the wider transport network. Recognition is also given in the Strategic Component to the need for seamless travel, including though improved (smart) ticketing and better journey information. This can be across the North at both regional and local level and include buses and light rail.

There is a recognition within this Strategic Component of a potential growth in air travel and it is likely that this would have a consequent impact on GHG emissions. However, as the Strategic Component notes, this growth in air travel would include the potential for all air freight to fly from the North's airports, compared to just 4% in 2016. Reducing surface transfer of freight to/from southern airports would therefore act to offset some of the GHG emissions from extra flights.

Implementation of the above noted elements would help to encourage a greater proportion of passenger movement by lower carbon modes and result in greater carbon efficiency. It would also likely result in a shift away from road transport. Effects are anticipated to be moderate adverse.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by the opening of major infrastructure projects such as HS2. Effects are anticipated to be slight beneficial.

Long Term: It is anticipated that rail journeys will have increased significantly due to this Strategic Component, but also other forms of public transport will continue to benefit due to full and continued implementation of Smart ticketing and better connections to the bus and cycle network. Effects are anticipated to continue to be moderate beneficial.

While there are likely to be some negative aspects due to issues such as increased flights, overall, it is considered that this Strategic Component will likely result in a **slight adverse** result.

Mitigation

Mitigation Measures: See Mitigation Table 1. Also, cross reference to Ensuring a Sustainable Investment Programme component.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity – for example through planting of native species. This Strategic Component notes the need for new transport interventions such as strategic park and ride facilities and Interchanges. No note is made of biodiversity, though there is a

potential for effects (positive and negative) on this from the new / upgraded infrastructure, depending upon the nature and location of interventions. Effects are anticipated to be a mix of both beneficial and adverse.

Medium Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of interventions. Effects are therefore anticipated to be a mix of beneficial and adverse.

Long Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of interventions. Effects therefore anticipated to remain as both beneficial and adverse.

Overall, it is anticipated that in relation to this ISA Objective in isolation, effects would be a **mix of beneficial and adverse**.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also Make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This Strategic Component notes the need for new transport infrastructure such as strategic park and ride facilities and Interchanges. No note is made of sites designated for nature conservation, though there is a potential for effects (positive and negative) on these from the new / upgraded infrastructure, depending upon the nature and location of the intervention. Effects are anticipated to be uncertain.

Medium Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention. Effects are therefore anticipated to be uncertain.

Long Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention. Effects are therefore anticipated to remain uncertain.

Overall, it is anticipated that in relation to this ISA Objective in isolation, effects are **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity and the need to protect all sites designated for nature conservation.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	ST-LT	Perm	Med	-	+	+	+

Commentary

Short Term: A key element to this Strategic Component is 'Multi-Modal Connectivity Improvements' where there is recognition within this Strategic Component that there is a need to encourage passengers to choose rail over their car for shorter and longer journeys. There is a recognition that opportunities for interchanges between modes need to be improved, along with the interchanges themselves e.g. more enhanced interchanges at railway stations and strategic park and ride facilities. It is also recognised that improvements can also be made at a local level to connect bus and cycle provision with the wider transport network.

Recognition is also given in the Strategic Component to the need for seamless travel, including though improved (smart) ticketing and better journey information. This can be across the North at both Regional and Local level and include buses and light rail.

There is a recognition within this Strategic Component of a potential growth in air travel and it is likely that this would have a consequent impact on air quality through emissions. However, as the Strategic Component notes, this growth in air travel would include the potential for all air freight to fly from the North's airports, compared to just 4% in 2016. Reducing surface transfer of freight to/from Southern airports would therefore act to offset some of the emissions from extra flights.

Implementation of the above noted elements would help to encourage a greater proportion of passenger movement by modes that offer less emissions per passenger and result in in some instances (e.g. cycle) zero emissions.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by the opening of major infrastructure projects such as HS2.

Long Term: It is anticipated that rail journeys will have increased significantly due to this Strategic Component, but also other forms of public transport will continue to benefit due to full and continued implementation of Smart ticketing and better connections to the bus and cycle network. Effects are anticipated to continue to be moderate beneficial.

While there are likely to be some negative aspects due to issues such as increased flights, overall, it is considered that this Strategic Component will likely result in a **slight beneficial** result through supporting the minimisation of emissions of air pollutants and through that enhancing air quality.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Although no specific mention is made of extreme weather events, this Strategic Component does make specific reference to the need for the North's transport system to be resilient and that members of society can use it with confidence. More enhanced interchange between modes of transport will also allow for increased resilience to extreme weather events as it will allow greater flexibility in journey planning, i.e. if one mode or route is disrupted by an extreme event such as flooding, other travel options may still be available. Implementation of enhanced interchange opportunities should help promote an increase in the resilience of the transport network to extreme weather events and subsequent consequences such as flooding.

Medium Term: As issues relating to the resilience of the North's transport system are addressed, along with development of more enhanced interchange, it is anticipated that resilience to extreme weather events will increase, resulting in continued slight beneficial effects.

Long Term: Resilience to extreme weather events should be enhanced as issues relating to reliability of links are addressed, though it is to be noted that in the longer term the frequency and intensity of extreme weather events is anticipated to increase, and this may result in some slight decline as overall resilience becomes more challenging to maintain.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Implementation of this Strategic Component will involve the development of the full range of transport interventions, many of which could have adverse effects on the water environment – for example, new roads will increase impermeable area and potentially lead to contaminated runoff. Pollution incidents may also occur during construction and as a result of accidents when operational. Increased use of inland and coastal waterways for transport are likely to lead to potential pollution, both directly from vessels and from associated inland waterways. The uptake of LZEVs may reduce the potential for pollution runoff from roads, though overall numbers are likely to be small in the short term and beneficial effects minimal. While precise effects will be dependent upon the nature and location of interventions, it is anticipated that these would typically be slight adverse.

Medium Term: Specific measures are being introduced under the WFD to address water pollution from the transport network, in particular from roads, but these could be hampered by the anticipated increase in interventions under this Strategic Component. It is anticipated effects would remain slight adverse.

Long Term: Slight adverse effects are considered likely to continue, though an increase in LZEVs would reduce the potential for polluted runoff from roads over the longer term.

Overall, anticipated effects from this Strategic Component, in isolation, are **slight adverse**.

Mitigation

Mitigation Measures: See Mitigation Table 6.

Recommendations: Make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to the water environment.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓/✗	Local-Reg	ST-LT	Perm	Med	-	-	+	+/-

Commentary

Short Term: New infrastructure or infrastructure improvements (such as road and rail) which could have an effect on soil or areas of contamination are likely under this Strategic Component. This could include, for example, direct loss or large scale disturbance of soil due to encroachment of new interventions on greenfield areas, or potential contamination of new areas due to accidental pollution incidents or road runoff. In contrast, new interventions may provide an opportunity to remediate contaminated land, or remove invasive species in brownfield areas. Precise effects will be dependent upon the nature and location of interventions, but are anticipated to likely be a mix of slight beneficial and slight adverse effects, but a balance of sight adverse

Medium Term: A mix of effects (beneficial or adverse) are anticipated to continue due to continued development of interventions under this Strategic Component, but a balance of sight adverse

Long Term: Over the longer term, effects are likely to become more beneficial as major interventions will have already been undertaken and a growth in LZEV use will lead to less polluted runoff. There will be continued opportunities to address issues such as invasive species.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: The full range of interventions anticipated under this Strategic Component could lead to a mix of beneficial or adverse effects on the setting of historic assets. For example, interventions could be developed adjacent to a historic site or these could relieve congestion in historic town centres. Development of interventions in greenfield areas is more likely to encounter archaeological features that have not previously been disturbed by urban development and would have an adverse effect. In contrast, upgrades to existing infrastructure could provide an opportunity to refurbish or enhance features of industrial heritage, e.g. canals, railway stations, etc. It is anticipated effects on the historic environment would likely be a mix of slight beneficial or adverse effects (with precise effects dependent on the nature and location of interventions).

Medium Term: It is anticipated that continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Long Term: Continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local-Reg	ST-LT	Perm	Med	--	--	-	--

Commentary

Short Term: This Strategic Component involves the development of the full range of transport interventions, which can have potential adverse effects, particularly if located in or near areas of higher landscape or townscape character. Effects would be most pronounced for new road or rail routes which would most likely result in encroachment to greenfield areas. Effects may be reduced in existing urban areas, but here infrastructure can still encroach on areas of open space or recreation. In contrast, in some areas, interventions may provide opportunities for enhancement, e.g. as part of well-planned urban regeneration, or by reducing congestion in urban areas. Development of EV network would have minimal effect in the urban area. Notwithstanding any potential enhancement opportunities, due to the scale of new routes, and as it would take a while for any screening to generate, in the short term, effects are anticipated to be moderate adverse, though precise effects would depend on the nature and location of intervention.

Medium Term: Screening would not be fully mature and any new intervention would still represent a new feature in the landscape / townscape. Effects are anticipated likely to remain moderate adverse.

Long Term: Screening would have had time to mature for the majority of interventions and increasing dominance of LZEVs would also reduce air and noise effects. Effects are anticipated to be slight adverse.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **moderate adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9. Also, cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to landscapes and townscapes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✗	Local	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: Construction of the full range of new transport interventions under this Strategic Component is likely to result in requirements for additional resources and increased waste production, though opportunities are likely for using recycled materials, e.g. pavement and structural materials, as well as reusing and or recycling materials during and after construction. It is to be noted that road construction tends to use more materials per km than rail. It is also the case that the increased travel opportunities promoted under this Strategic Component will result in more energy use / use of natural resources. It is therefore anticipated that effects will be moderate adverse.

Medium Term: It is anticipated that there would be further use of materials and waste generated as interventions are developed to meet the anticipated increases in travel demand / opportunities. This would also continue to require more energy use. However, improvements in construction techniques, greater emphasis on circular economy approach and switch to more energy and resource efficient vehicles and rail technology, mean negative effects may be reduced. Effects are anticipated to be slight adverse.

Long Term: While in the longer term most interventions will have already been constructed, there would still remain an ongoing requirement for energy use and effects are anticipated to remain slight adverse.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10. Also, cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to the prudent use of natural resources etc.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓✓	Reg-Nat	ST-LT	Perm	Med	+++	+++	+++	+++

Commentary

Short Term: A key element to this Strategic Component is 'Multi-Modal Connectivity Improvements' where there is recognition of a need to encourage passengers to choose rail over their car for shorter and longer journeys. There is a recognition that opportunities for interchanges between modes need to be improved, along with the interchanges, e.g. more enhanced interchanges at railway stations and strategic park and ride facilities. It is also recognised that improvements can also be made at a local level to connect bus and cycle provision with the wider transport network.

Recognition is also given in the Strategic Component to the need for seamless travel, including though improved (smart) ticketing and better journey information. This can be across the North at both Regional and Local level and include buses and light rail.

There is a recognition within this Strategic Component of a potential growth in air travel and this cannot be considered low carbon. However, as the Strategic Component notes, this growth in air travel would include the potential for all air freight to fly from the North's airports, compared to just 4% in 2016. Reducing transfer of freight to Southern airports would therefore act to offset some of the carbon emissions from extra flights.

Implementation of the above noted elements would help to encourage a greater proportion of passenger movement by lower carbon modes and result in greater carbon efficiency. It will also likely result in minimising dependence on the private car, as well as promote a shift to rail travel into and between city centres. Public transport will have enhanced availability and convenience and increased accessibility. Wider choice of passenger travel will be available through quality integrated facilities and services and there will be better bus and cycle provision. Improved ticketing and travel planning is recognised. While the transport needs of rural communities are not specifically addressed, there is recognition that a nuanced approach to transport provision and connectivity is needed as not all economic centres are in the largest towns and cities. Specific recognition is made that affordability, security, and physical access, as well as ease of understanding of how best to navigate the system and ease of use, are of crucial importance. Large beneficial effects are anticipated.

Medium Term: It is anticipated that the above noted measures would act to make public transport a much more attractive and convenient mode of travel and would continue to promote a preference for lower carbon means of transport over the private car, even as the use of LZEVs increases.

Long Term: It is anticipated that the above noted measures would act to make public transport a much more attractive and convenient mode of travel and would continue to promote a preference for lower carbon means of transport over the private car. However, increasing dominance of LZEVs is likely to make private motorised passenger transport increasingly low carbon, eventually exceeding that of rail transport in terms of GHG / travel kilometre.

While there are likely to be some negative aspects due to issues such as increased flights, overall, it is anticipated that this Strategic Component will likely result in a Large Beneficial effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: It is a stated aim of this Strategic Component to result in better transport links and connectivity between the North's economic centres and assets and, if realised, this would enhance long term economic prosperity and promote economic transformation. For example, it would help make more jobs accessible and increase the number of potential workers for businesses. Capacity, resilience and reliability of the transport network would also improve. This Strategic Component also promotes better linkages and connectivity across regional and international borders for the movement of goods and labour and will encourage growth strategies and develop the North as a great place to do business.

Overall journey times would likely fall through faster, more frequent and reliable services. There is also specific acknowledgement of the requirement to promote and stimulate investment at both the local and regional level and it is noted that an effective transport network will help increase investment.

It is recognised that not all the North's economic centres are in the largest towns and cities, so a nuanced approach is required to ensure the skills and jobs can reach the labour markets they require. Large beneficial effects are anticipated.

Medium Term: The better transport links and connectivity between the North's economic assets and centres promoted by this Strategic Component will help to ensure that predicted growth under the transformational scenario is achieved.

Long Term: Continued investment in better transport links and connectivity between the North's economic assets and centres promoted by this Strategic Component will help to ensure that predicted growth under the transformational scenario is achieved.

Overall, it is anticipated that this Strategic Component would result in **large beneficial** effects for this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: This Strategic Component recognises that transport investment can stimulate other investment – residential, commercial and industrial - and notes that growth strategies are under development centred on existing plans such as HS2. The Strategic Component recognises that TfN can help promote and stimulate investment at both a regional and local level. It is also recognised that TfN are working collaboratively with other regional bodies such as Midlands Connect, Transport Scotland and the Welsh Government.

Medium Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them.

Long Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them.

Overall, it is anticipated that this Strategic Component would result in **large beneficial** effects for this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: This Strategic Component should result in making an increased number and range jobs more accessible to a greater range of people and should therefore help achieve a fairer society. It is also recognised that not all the North's economic centres are in the largest towns and cities, so a nuanced approach is required to ensure the skills and jobs can reach the labour markets they require. The Strategic Component further recognises that in the business as usual scenario, limited reach of labour markets means that Northern workers have fewer job opportunities, and Northern employers have much smaller labour markets. This is holding back wages and productivity and makes the North a less attractive place for businesses. Addressing these issues should also contribute to achieving a fairer society through providing greater equality of opportunity.

Medium Term: Implementation of this Strategic Component would continue to provide a greater equality of opportunity across the North.

Long Term: Implementation of this Strategic Component would continue to provide a greater equality of opportunity across the North.

Overall, it is anticipated that this Strategic Component would result in **moderate beneficial** effects for this ISA Objective.

Mitigation / Recommendations

Mitigation Measures: See EqIA sub-objectives.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: This Strategic Component should result in making an increased number and range jobs more accessible to a greater range of people and will therefore potentially help achieve improvements in well-being and reduced inequalities in health through enhanced employment options, particularly for lower income groups. Although not specifically referenced in this Strategic Component, it is also possible that enhanced connectivity will provide greater access to both leisure and health facilities, thereby helping to reduce inequalities in health. Moderate beneficial effects are anticipated.

Medium Term: Implementation of this Strategic Component would continue to provide greater access employment opportunities and leisure and health facilities, with moderate beneficial effects anticipated.

Long Term: Implementation of this Strategic Component would continue to provide greater access employment opportunities and leisure and health facilities, with moderate beneficial effects anticipated.

Overall, implementation of this Strategic Component is anticipated to result in **moderate beneficial** effects in relation to this ISA Objective.

Mitigation

Mitigation Measures: It should also be recognised that cross reference should be made to the Strategic Component 'Ensuring a Sustainable Investment Programme' as this will commit TfN to work with other organisations such as Public Health England, to explore how investment in transport can have positive impacts on people's health.

See HIA sub-objectives.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: This Strategic Component specifically recognises that it is important that all members of society feel able to use the transport network with confidence and that issues such as affordability, security, and physical access, as well as ease of understanding of how best to navigate the system and ease of use, are of crucial importance.

Medium Term: Implementation of this Strategic Component should result in continued recognition of the importance of all members of society feeling able to use the network with confidence, contributing to improved. community safety, reduced crime and fear of crime.

Long Term: Implementation of this Strategic Component should result in continued recognition of the importance of all members of society feeling able to use the network with confidence, contributing to improved community safety, reduced crime and fear of crime.

Overall, implementation of this Strategic Component is anticipated to result in **moderate beneficial** effects for this ISA Objective.

Mitigation / Recommendations

Mitigation Measures: See CSA sub-objectives.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The policy discusses the need for multimodal transport to become easier, and for interchanges between modes of travel to be improved. This will improve accessibility as the integration between modes, which will be more efficient and connected, and people will benefit from close links to Northern Powerhouse rail and HS2 and local level. Improvements can also be made to connect bus and cycling provision with the wider transport network.

These improvements could also improve the accessibility to jobs within the North to a wide range of people, which will particularly benefit those that are unemployed.

The improved links are also likely to have a positive effect on access to services, such as social, employment and education. This will also benefit those without a car, disabled people, older people and for young people.

Medium Term: Developing multi-modal transport to become easier will improve access to services, especially when enhancing the integration between the various modes. This is likely to have a positive effect on access to services, such as health care. It will also benefit those without a car, as mentioned in the short term. These benefits are likely to increase as the easier multimodal transport becomes and the enhanced integration between different modes filters into many communities within the North.

Long Term: As with the medium-term benefits, enhanced multimodal transport, interchanges and mode integration are likely to improve accessibility, especially for those without access to a car. These benefits will be increased over the long term when the enhancements to multimodal travel become integrated into communities and reach their full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. Areas with higher deprivation are more likely to have higher proportions of people who live in no car households and have disabilities or limiting conditions. Therefore, improvements to public transport connectivity would be of particular benefit.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The policy suggests that people should be able to have a seamless travel experience, including improved ticketing and improved travel information. The improved ticketing may reduce the need for people to buy multiple tickets, and may lower the cost of travel. Furthermore, improving the information available to people could enable them to become better informed about the cheapest travel choices and tickets. This option is particularly beneficial to lower income groups, older people and people with disabilities.

Medium Term: As with the short term, improved ticketing may allow people to become better informed of the travel choices and ticket options. This may have benefits on affordability, these benefits are likely to increase as the ticketing system becomes embedded. It may also encourage mode shift from car to public transport as people become more aware of the options available to them.

Long Term: There are likely to be increased benefits to affordability as an improved ticketing with better information becomes integrated in the transport system. Therefore, these benefits are likely to be maximised over the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: New transport initiatives to improve business connectivity are priced in line with existing transport options. This will ensure that the services will provide individuals with access to employment.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The strategy component discusses the 'opportunities for interchanges between modes to be improved'. It is assumed any new infrastructure will have appropriate safety considerations and therefore, improved interchanges and waiting facilities should improve the perception of safety and security. At a local level improving cycling provision may also have an improvement on perceived safety and security issues. This has the potential to benefit a range of people, including women, young people, older people, black and minority ethnic groups and disabled people, who are all more likely to have a more prevalent perception of safety and can be more susceptible to hate crimes.

Medium Term: As with the short term, improving interchanges and waiting facilities are likely to increase the perception of user safety and security, especially if they are well maintained and have the appropriate safety considerations.

Long Term: Interchanges and waiting facilities will need to be maintained in order to keep adequate lighting and safety features over the longer term. Improving safety features are particularly beneficial for women, people of certain faiths and people with disabilities.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

When improving interchanges and cycling provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. Cycle infrastructure should be designed to enhance cyclist safety, and reduce potential conflicts with traffic and pedestrians. It should also be well maintained and well-lit and signed.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The policy mentions the importance for people choosing rail travel for both their longer and shorter journeys. Furthermore, increasing the ease of multimodal travel may promote a modal shift from car to public transport. Consequently, reducing vehicle km and cars on the road and consequently reducing the number of accidents, especially

with vulnerable user groups such as pedestrians and cyclists. Furthermore, enhancing cycling provision could create a safer environment for cyclists, pedestrians and car users and reducing the need for conflict between these user groups.

Road safety improvements would also benefit children, older people and those living in deprived areas, who are all more susceptible to being involved in a road traffic collision.

Medium Term: Creating a mode shift form car to public transport is likely to have larger benefits in the medium term than the short term as it could take some time for the infrastructure to be implemented and therefore the benefits to be maximised.

Long Term: As with the medium term, benefits are likely to be increased over the longer term as the infrastructure develops so an increasing number of people choose rail as an option instead of car. This mode shift would be particularly beneficial in areas of high density of pedestrians and cyclists, children, older people and people living in deprived areas.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

Liaising with relevant stakeholders such as the police and road safety officers, would improve knowledge of the types of accidents and be able to provide advice on how to reduce them.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	LT	Temp	Low	+	++	++	++

Commentary

Short Term: Enhancing interchanges between multi-modal travel could create a mode shift from car to public transport by making journeys more attractive and easier by train and other forms of public transport. This could reduce traffic on key road corridors and therefore, reduce the perception of severance. There are certain groups that are particularly vulnerable to the effects of severance who are likely to benefit, these include no car households, older people, children and people with disabilities.

Medium Term: By making journeys more attractive by train, a mode shift from car to public transport is likely to have larger benefits in the medium term than the short term as it could take some time for the infrastructure to be implemented and therefore the benefits to be maximised.

Long Term: As with the medium term, benefits are likely to be increased over the longer term as the infrastructure develops so an increasing number of people choose rail as an option instead of car this could reduce traffic on key road corridors and consequently reduce severance in the long term. This could be particularly important in places where these are amenities such as schools, GP surgeries, faith centres and social clubs.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local-Reg	LT	Temp	Low	+	++	++	++

Commentary

Short Term: Connecting the bus network and enhancing cycling provision to the wider transport network could make public transport/active travel a more attractive option. This has the potential to create a mode shift from car to other modes of transport, which could consequently reduce the air and noise pollution within some transport corridors. This is especially important in dense urban areas with facilities that may contain a high proportion of children (such as schools). People in deprived communities also tend to experience poorer air quality as a result of transport related air pollution, so improvements that benefit this group would be particularly beneficial.

Medium Term: As the infrastructure is maximised and developed, there are likely to be an increasing number of people choosing public transport over cars. Therefore, this could have greater benefits over the medium term compared to the short term, as traffic reduces and the consequent emissions and noise and light pollution also reduce.

Long Term: As with the medium term as public transport becomes more connected to the wider network, there could be an increasing number of people switching from car to public transport for some or all of their journeys. Therefore, this could have increasing vibration and air, noise and light pollution reductions.

Fewer cars and more sustainable travel could have a beneficial impact to noise and air pollution, which would be beneficial for children, older people and those with disabilities.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity is important to consider urban and income deprived areas. Furthermore, children are particularly vulnerable to noise pollution, therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: The policy discusses the need for multimodal transport to become easier. Focussing on this will improve accessibility as the integration between modes becomes more efficient. This policy also details the need for interchanges between modes of travel to be improved, so that people can benefit from close links to Northern Powerhouse rail and HS2, and at a local level. Improvements can also be made to connect bus and cycling provision with the wider transport network. These measures within the policy will help improve access for those without a car, which is likely to be a high proportion of children and adolescents, older people, disabled people and lower income groups. Furthermore, better links to, and interchanges between public transport have the potential to increase activity and consequent health benefits for all user groups.

Medium Term: Developing multi-modal transport to become easier will improve access to services, especially when enhancing the integration between the various modes. This is likely to have a positive effect on access to services, such as health care. This will be particularly beneficial for those without a car, as mentioned in the short term. However, benefits are likely to increase as easier multimodal transport more prevalent and the enhanced integration between different modes filters into many communities within the North.

Long Term: As with the medium-term benefits, enhanced multimodal transport, interchanges and mode integration are likely to improve accessibility, especially for those without access to a car. These benefits will be increased over the long term when the enhancements to multimodal travel become integrated into communities and reach their full potential.

Mitigation

Mitigation Measures: See Mitigation Table 15.

Comprehensive communication and engagement strategy to inform the public of changes to existing services and new services, in order to ensure people are aware of the changes to public transport, and the options that are, and are becoming available to them.

Recommendations:

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. Areas with higher deprivation are more likely to have higher proportions of people who live in no car households and have disabilities or limiting conditions. Therefore, improvements to public transport connectivity would be of particular benefit. Areas with greater numbers of older people and children will also benefit from access to health care.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: The component mentions that people should be able to have a seamless travel experience, including improved ticketing and improved information. This improved ticketing may reduce the need for people to buy multiple tickets. Furthermore, improving the information available to people could enable them to become better informed about the cheapest travel choices and tickets. This option is particularly beneficial to lower income groups, and for older people and people with disabilities who may be benefit from a clearer ticketing process.

Medium Term: As with the short term, improved ticketing may allow people to become better informed of the travel choices and ticket options available to them. This may have benefits on affordability, and these benefits are likely to increase as the ticketing system becomes embedded.

Long Term: There are likely to be increased benefits to affordability as an improved ticketing with better information becomes integrated in the transport system. Therefore, these benefits are likely to be maximised over the long term. These benefits could include an increase in employment in areas where the unemployed currently do not have an affordable, accessible connection to employment.

Mitigation / Recommendations

Mitigation Measures See Mitigation Table 15.

Recommendations:

The STP should seek to ensure that new transport initiatives to improve business connectivity are priced in line with existing transport options. This will ensure that the services will provide individuals with access to employment.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: The strategy component discusses the 'opportunities for interchanges between modes to be improved'. It is assumed any new infrastructure will have appropriate safety considerations and therefore, improved interchanges and waiting facilities should improve the perception of safety and security. At a local level improving cycling facilities may also have an improvement cyclist safety.

Medium Term: As with the short term, improving interchanges and waiting facilities are likely to increase the perception of user security if they are well maintained and have the appropriate safety considerations.

Long Term: Interchanges and waiting facilities will need to be maintained in order to keep adequate lighting and safety features over the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and cycling provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV.

Cycle infrastructure should be designed to enhance cyclist safety, and reduce potential conflicts with traffic and pedestrians. It should also be well maintained and well-lit and signed.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The policy mentions the importance for people to choose rail for both their longer and shorter journeys, which would reduce traffic on roads. Furthermore, increasing the ease of multimodal travel may promote a modal shift from car to public transport. Consequently, reducing vehicle km and cars on the road should reduce the number of accidents, especially with vulnerable user groups such as pedestrians, cyclists, older people and children in deprived areas. Additionally, enhancing cycling provision could create a safer environment for cyclists, car users and pedestrians through reducing conflict between these user groups.

Medium Term: Creating a mode shift from car to public transport is likely to have larger benefits in the medium term than the short term, as it could take some time for the infrastructure to be implemented and therefore the benefits to be maximised.

Long Term: As with the medium term, benefits are likely to increase over the longer term as the infrastructure develops so an increasing number of people choose rail as an option instead of car. As a result, fewer cars and the consequent congestion reduction should have a beneficial impact on road safety, as traffic is smoother the risk of collisions should reduce.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New infrastructure should be planned and designed with improving road safety as an overarching aim. This should include eliminating conflicts between traffic and vulnerable road users such as cyclists and pedestrians. A comprehensive communication and engagement strategy will help promote public transport changes and new services, which in turn will encourage mode shift away from cars, reducing the accidents rate per vehicle kilometre

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	LT	Temp	Low	+	++	++	++

Commentary

Short Term: Enhancing interchanges between multi-modal travel could create a mode shift from car to public transport, by making journeys more attractive and easier by train. This could reduce traffic on key road corridors and therefore, reduce the perception of severance.

Enhancing and developing routes for cyclists and pedestrians will also create additional links to facilities and services, which will ensure there are suitable provisions to enable them to cross traffic and reduce severance caused by traffic that they currently experience.

Medium Term: Through improving public transport journeys, a mode shift from car use is likely to have larger benefits in the medium term than the short term in reducing traffic. This would help maximise the benefits being experienced by pedestrians in particular, who could find it easier to cross roads that have less traffic travelling on them. This reduction in severance could also encourage the public to cycle and walk to more destinations than use their car, which in turn should improve their health.

Long Term: As with the medium term, benefits are likely to increase over the longer term as an increasing number of people switch from their cars to other modes, and consequently reducing traffic on key road corridors and consequently reduce severance in the long term. As more people are encouraged to walk and cycle due to reduced severance, more people will become active, this will not only improve their own health but in the future could reduce pressures on the NHS.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	LT	Temp	Low	+	++	++	++

Commentary

Short Term: Connecting bus and cycling provision to the wider transport network could make public transport and active travel a more attractive option. This has the potential to create a mode shift from car to other modes of transport which could consequently reduce air and noise pollution within some transport corridors. This is especially important in dense urban areas with facilities that may contain a high proportion of children (such as schools and nurseries), or health problems (such as hospitals and GP surgeries). People in deprived communities also tend to experience poorer air quality as a result of transport related air pollution, so any improvements that benefit them through a reduction in traffic emissions would be particularly beneficial.

Medium Term: As the infrastructure is developed, there are likely to be an increasing number of people choosing public transport over cars. Therefore, this could have greater benefits over the medium term compared to the short term.

Long Term: As with the medium term as public transport becomes more connected to the wider network, there could be an increasing number of people switching from car to public transport for some or all of their journeys. Therefore, this could result in a reduction in noise and vibrations caused by traffic, in addition to a reduction in light and air pollution.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity, it is important to consider urban and income deprived areas in particular. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are more likely to suffer the health impacts of it. Therefore, any improvements would benefit them in particular. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds). Furthermore, people with long term health conditions, such as asthma will be particularly vulnerable to areas that have high quantities of air pollution.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Reg-Nat	LT	Temp	Low	+	++	++	++

Commentary

Short Term: The strategic component mentions the importance for people choosing rail travel for both their longer and shorter journeys. Increasing the ease of multimodal travel may promote a modal shift from car to public transport, consequently reducing vehicle km and cars on the road, and therefore reducing the number of accidents.

Medium Term: Creating a mode shift form car to public transport is likely to have larger benefits in the medium term than the short term as it could take some time for the infrastructure to be implemented and therefore the benefits to be maximised.

Long Term: As with the medium term, benefits are likely to be increased over the longer term as the infrastructure develops, and assuming an increasing number of people choose rail as an option instead of car. This mode shift would be particularly beneficial in areas of high density of pedestrians and cyclists, children, older people and people living in deprived areas.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

Liaising with relevant stakeholders such as the police and road safety officers, would improve knowledge of the types of accidents and advice on measures to reduce them.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Temp	Low	+	++	++	++

Commentary

Short Term: The strategy component discusses the 'opportunities for interchanges between modes to be improved'. It is assumed any new infrastructure will have appropriate safety considerations and therefore, improved interchanges and waiting facilities should improve the perception of safety and security. At a local level improving cycling provision may also have an improvement on perceived safety and security issues for cyclists.

Medium Term: As with the short term, improving interchanges and waiting facilities are likely to increase the perception of user safety and security, especially if they are well maintained and have the appropriate safety considerations. It is considered likely that interchange improvements and other services will be implemented in the medium term onwards and therefore an increased benefit is felt compared to the short term.

Long Term: Interchanges and waiting facilities will need to be maintained in order to keep adequate lighting and safety features over the longer term. Improving safety features are particularly beneficial for women, people of certain faiths and those with disabilities or mobility impairments.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and cycling provision, it is important to ensure that the areas are well lit and have good visibility so that people are able to see any potential dangers, and where appropriate, implement CCTV. Cycle infrastructure should be designed to enhance cyclist safety, and reduce potential conflicts with traffic and pedestrians. It should also be well maintained, well-lit and signed.

G.3. Assessment of Strategic Component – Connecting Business

Table G-5 Strategic Component: Connecting Business – Description and Key Assumptions

Strategy Component: Connecting Business
Connectivity between the North's economic centres and assets The industries identified as the four prime and three enabling capabilities, as well as businesses in the wider economy, are spread across the region. Improving connectivity has the potential to increase trade, collaboration, share ideas and reduce costs for businesses and their operations. The Northern Powerhouse Independent Economic Review provided a picture of the existing economic links. Enhancing these links will aid agglomeration and support the growth of those capabilities. The industrial links that need improving include those between: • the professional service sectors located in all our towns and cities, with concentrations in Leeds City Region and Greater Manchester City Region; • the aerospace and defence industry in Brough, Central Lancashire and Barrow, and materials and process research and development in Greater Manchester and Sheffield; • advanced manufacturing, energy and health innovation capabilities in the Atlantic Gateway, Teesport Gateway and Cheshire Science Corridor, Hull and Humber, and the West and South Cumbria (the highest proportion of manufacturing workers in the UK), and universities, consultancies and international airports; • new advanced manufacturing capabilities at both the International Advanced Manufacturing Park in the North-East and the Advanced Manufacturing Innovation District in the Sheffield City Region, and firms in their hinterland, the wider North of England and beyond; • the agricultural food production and food industry in York, North Yorkshire and the East Riding of Yorkshire, Hull and Humber, Cumbria, and Leeds City Region; • the freight and logistics sector, serving businesses via our ports, airports and inland distribution facilities, such as iPort in Doncaster and the new Liverpool2 deep-water container terminal, to enhance connectivity for people and businesses across the North and the UK; and • the nuclear energy industry, including the power plants in Cumbria, Tees Valley and Lancashire – this means links with nuclear processing facilities in Cheshire, Warrington and Cumbria and with the nuclear research and development organisations in Lancashire, Greater Manchester and the Sheffield City Region. Poor road and rail connectivity between economic centres is affecting the capability clusters and preventing the growth in supply chains. This is also true for a number of economic assets outside the urban cores. This means that TfN needs to determine interventions that will best support businesses in rural and urban economic centres across the North. Improved connectivity will also facilitate more face-to-face interaction and support stronger service and product markets. Existing road links are not always efficient, resilient, or reliable enough to support these connections. Similarly, rail connectivity needs to support businesses, as well as being better connected globally. **Multi-Modal connectivity improvements** Different types of businesses use and rely on different modes of travel. Some physically move goods, others require the movement of people's minds and ideas through collaboration. Businesses need a seamless journey experience across the North, so that their operations can grow and meet their daily business requirements. For businesses and collaborators, transport investment can open up and support major development sites. Clusters can grow in the same vicinity, and an improved transport network can aid collaboration and the supply chain to connect localities across the North and beyond. **Delivering nationally significant infrastructure projects, major employment and major local development approvals** For businesses, the transport network plays a critical role in delivering major development sites and nationally significant infrastructure projects. This is especially hard in areas that are isolated, or where the topography makes moving materials by road difficult. A lack of suitable provision on the road and rail network, which impacts on reliability and resilience, could hold back nationally significant infrastructure projects, particularly in more remote areas, or areas not served by rail. Examples include the Moorside Nuclear Power Station, the International Advanced Manufacturing Park in Sunderland and South Tyneside, and Liverpool2 - the new £400 million deepwater container terminal at the Port of Liverpool. **Cross border connectivity with the North's economic neighbours** Links with the North's neighbouring economies play a critical role in realising the economic potential of both the North and the UK. Without interventions, the current links will not fully support growth in either one of these economies. Businesses within the North have supply chains, competitors and collaborators that are beyond the geographical boundaries of the North. Connectivity should not be hindering the potential for growth, but supporting it.

Strategy Component: Connecting Business
Supporting the international connectivity of the North There were around 2 million return business-related air trips to and from the North in 2016. £5 billion of current GVA in the North from air passengers is derived from business productivity brought about through direct international air connections to and from the North's airports. A key challenge is to attract more businesses to take advantage of the North's prime and enabling capabilities. To achieve this, it needs to be easier, cheaper, faster and more reliable to travel to and from the North's gateways. The Independent International Connectivity Commission found that, of the additional 12 million additional passengers required under the transformational growth scenario, there would be 1.5 million more business trips than the baseline scenario, adding over £4 billion to the economy. Northern airports have the capacity to handle an additional 60 million passengers a year. If supported, this would mean that of the total 75 million passengers by 2050 (under transformational growth) there would be 10 million business-related air passengers, making up a higher share of the North's air travel market than today. Achieving this growth would more than double the economic contribution of Northern airports, reaching £13 billion (from £5.5 billion in October 2016). Increasing the range of destinations and the frequency of direct international services to and from the North will boost efficiency, encourage entrepreneurship, enhance employment opportunities and increase foreign direct investment, inward investment and export opportunities. Securing new routes depends on demonstrating a sufficient passenger demand, with good surface access being key to increases in airport and port catchment areas. This is the case with strategic transport interventions such as HS2 and Northern Powerhouse Rail at Manchester Airport.
Key Assumptions *There is a full range of interventions possible under this strategic component. These are:* ***Highways*** • *New highway links* • *Highway infrastructure improvements* • *Smart highways / adaptive network* ***Railways*** • *New rail links* • *Rail infrastructure improvements* • *Station upgrades* ***Public transport (excl. rail)*** • *Park and ride schemes* • *Station and interchange works* ***Enabling infrastructure*** • *EV facilitating* • *Smart / adaptive roads* • *Digital connectivity* ***Waterways*** • *Inland and coastal port upgrades* • *Use of canals*

Table G-6 Assessment of Strategic Components: Connecting Business

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✗	Local-Reg	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: This Strategic Component deals with connecting businesses, noting that these are spread across the region and that they need good road and rail connections to allow them to grow, which requires improvements to the current situation. This Strategic Component also emphasises the need to facilitate the growth in air connections. Each of these modes will have effects on GHG emissions during both construction and operation and in the absence of any shift in mode, are anticipated to be moderate adverse.

Medium Term: It is anticipated that a growth in road and rail would represent adverse effects on GHG emissions, though these could be reduced by the anticipated growth in LZEVs. It is therefore anticipated that effects would be slight adverse over the medium term.

Long Term: It is anticipated that a growth in road and rail would represent adverse effects on GHG emissions, though these could be reduced by the anticipated growth in LZEV use (it is a government aim for almost every car to be zero emission by 2050). It is therefore anticipated that effects would be slight adverse over the long term.

Overall, this Strategic Component, in isolation, is\anticipated to result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1. Also cross-reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to GHG emissions.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity – for example through planting of native species. This Strategic Component notes the need for new transport interventions such as strategic park and ride facilities and Interchanges. No note is made of biodiversity, though 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. Effects are therefore anticipated to be a mix of positive and adverse.

Medium Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention.

Long Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be a mix of **beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This Strategic Component notes the need for new transport infrastructure such as strategic park and ride facilities and Interchanges. No note is made of sites designated for nature conservation, though there is a potential for effects (positive and negative) on these from the new / upgraded infrastructure, depending upon the nature and location of interventions. Effects are anticipated to be uncertain.

Medium Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention. Effects are therefore anticipated to be uncertain.

Long Term: Effects (positive or negative) could be experienced in the Medium Term depending upon the nature and location of the intervention. Effects therefore anticipated to remain uncertain.

Overall, it is anticipated that in relation to this ISA Objective in isolation, effects are **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity and the need to protect sites designated for nature conservation purposes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✘	Local-Reg	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: This Strategic Component deals with connecting businesses, noting that these are spread across the region and that they need good road and rail connections to allow them to grow, which requires improvements to the current situation. This Strategic Component also emphasises the need to facilitate the growth in air connections. Each of these modes will have effects on air quality during both construction and operation and in the absence of any shift in mode, are anticipated to be moderate adverse.

Medium Term: It is anticipated that a growth in road and rail would represent adverse effects on air quality, though these could be reduced by the anticipated growth in LZEV use. It is therefore anticipated that effects would be slight adverse over the medium term.

Long Term: It is anticipated that a growth in road and rail would represent adverse effects on air quality, though these could be reduced by the anticipated growth in LZEV use (it is a government aim for almost every car to be zero emission by 2050). It is therefore anticipated that effects would be slight adverse over the long term.

Overall, it anticipated that this Strategic Component, in isolation, would result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: Although no specific reference is made of extreme weather events, this Strategic Component does make specific reference to existing road links having poor resilience. Reference is also made to the need for more reliable links to and from the North's gateways and notes how reliability / resilience issues can hold back nationally significant infrastructure projects. It can be inferred that addressing these issues would include in relation to reliability / resilience under extreme weather.

Medium Term: As issues relating to reliability of links are addressed, it is anticipated that resilience to extreme weather events will increase.

Long Term: Resilience to extreme weather events should be enhanced as issues relating to reliability of links are addressed, though it is to be noted that in the longer term the frequency and intensity of extreme weather events is anticipated to increase, and this may result in some slight decline as overall resilience becomes more challenging to maintain.

Overall, it is anticipated that this Strategic Component, in isolation, would result in **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Implementation of this Strategic Component will involve the development of the full range of transport interventions, many of which could have adverse effects on the water environment – for example, new roads will increase impermeable area and potentially lead to contaminated runoff. Pollution incidents may also occur during construction and as a result of accidents when operational. Increased use of inland and coastal waterways for transport (for example note is made of Liverpool 2 Deepwater Container Terminal) are likely to lead to potential pollution, both directly from vessels and from associated inland waterways. The uptake of LZEVs may reduce the potential for polluted runoff from roads, though overall numbers are likely to be small in the short term and beneficial effects minimal. While precise effects will be dependent upon the nature and location of interventions, it is anticipated that these will typically be slight adverse.

Medium Term: Specific measures are being introduced under the WFD to address water pollution from the transport network, in particular from roads, but these could be hampered by the anticipated increase in interventions under this Strategic Component. It is anticipated effects would remain slight adverse.

Long Term: Slight adverse effects are considered likely to continue, though an increase in LZEVs would reduce the potential for polluted runoff from roads over the longer term.

Overall, it anticipated that this Strategic Component, in isolation, would result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 6. Also make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to the water environment.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓/✗	Local-Reg	ST-LT	Perm	Med	-	-	+	+/-

Commentary

Short Term: New infrastructure or infrastructure improvements (such as road and rail) which could have an effect on soil or areas of contamination are likely under this Strategic Component. This could include for example direct loss, or large scale disturbance of soil due to encroachment of new interventions on greenfield areas, or potential contamination of new areas due to accidental pollution incidents or road runoff. In contrast, new interventions may provide an opportunity to remediate contaminated land, or remove invasive species in brownfield areas. Precise effects will be dependent upon the nature and location of the intervention, but are considered to likely be a mix of slight beneficial and slight adverse effects, but a balance of sight adverse

Medium Term: A mix of effects (beneficial or adverse) are anticipated to continue due to continued development of interventions under this Strategic Component, but a balance of slight adverse

Long Term: Over the longer term, effects are likely to become more beneficial as major interventions will have already been undertaken and a growth in LZEV use will lead to less polluted runoff. There will be continued opportunities to address issues such as invasive species.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7, and also make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to soil and contamination.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: The full range of interventions anticipated under this Strategic Component could lead to a mix of beneficial or adverse effects on the setting of historic assets For example, interventions could be developed adjacent to a historic site or these could relieve congestion in historic town centres. Development of interventions in greenfield areas is more likely to encounter archaeological features that have not previously been disturbed by urban development and would have an adverse effect. In contrast, upgrades to existing infrastructure could provide an opportunity to refurbish or enhance features of industrial heritage e.g. canals, railway stations etc. It is Anticipated effects on the historic environment would likely be a mix of slight beneficial or adverse effects (with precise effects dependent on the nature and location of interventions).

Medium Term: It is anticipated that continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Long Term: Continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8, and also make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to historic and cultural heritage assets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✘	Local-Reg	ST-LT	Perm	Med	--	--	--	--

Commentary

Short Term: This Strategic Component notes the issue of lack of suitable road provision in more remote areas, or where there are issues with topography. These areas would typically be considered to be some of the more scenic and tranquil areas and this Strategic Component infers that there would be a requirement for road development in these areas.

Medium Term: Screening would not be fully mature and any new intervention would still represent a new feature in the landscape / townscape. Effects are anticipated likely to remain moderate adverse.

Long Term: Screening would have had time to mature for the majority of interventions and increasing dominance of LZEVs would also reduce air and noise effects. Effects are anticipated to be slight adverse.

As such it is considered that this Strategic Component, in isolation, would not protect landscape etc. and is considered **moderate adverse**.

Mitigation

Mitigation Measures: See Mitigation Table 9, and make cross reference to 'Ensuring a Sustainable Investment Programme' which will address landscape etc. issues and which should help to ameliorate effects.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✘	Local	ST-LT	Perm	Med	--	--	-	--

Commentary

Short Term: Construction of the full range of new transport interventions under this Strategic Component is likely to result in requirements for additional resources and increased waste production, though opportunities are likely for using recycled materials, e.g. pavement and structural materials, as well as reusing and or recycling materials during and after construction. It is to be noted that road construction tends to use more materials per km than rail. It is also the case that the increased travel opportunities promoted under this Strategic Component will result in more energy use / use of natural resources. It is therefore anticipated that effects will be moderate adverse.

Medium Term: It is anticipated that there would be further use of materials and waste generated as interventions are developed to meet the anticipated increases in travel demand / opportunities. Note also the anticipated growth in air travel. This would also continue to require more energy use. However, improvements in construction techniques, greater emphasis on circular economy approach and switch to more energy and resource efficient vehicles and rail technology, mean negative effects may be reduced. Effects are anticipated to be slight adverse.

Long Term: While in the longer term most interventions will have already been constructed, there would still remain an ongoing requirement for energy use and effects are anticipated to remain slight adverse.

Overall, it is anticipated that in relation to this ISA Objective in isolation, there would be **moderate adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10, and make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to recycling etc.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✗	Reg-Nat	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: This Strategic Component deals with connecting business and notes that these are spread across the region and that these need good road and rail connections to allow them to grow. This Strategic Component also emphasises the need to facilitate growth in air connections. The emphasis on road movement leads to anticipated moderate adverse effects.

Medium Term: Due to predicted trends in the growth of LZEV usage, it is anticipated that the emphasis on roads declines in significance and would lead to anticipated slight adverse effects.

Long Term: By 2050, government predictions indicate that almost every car and van would be zero emission. Anticipated effects are slight adverse in the long term.

Overall, this Strategic Component, in isolation, is unlikely to enhance lower carbon, affordable transport choice, with **slight adverse** effects anticipated.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Reg-Nat	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: It is a stated aim of this Strategic Component to improve connectivity in order to increase trade, collaboration, the sharing of ideas and reduce costs for business. This Strategic Component would also help deliver major development sites and nationally significant infrastructure projects. Large beneficial effects are anticipated.

Medium Term: Continued improvement in connectivity and the ongoing delivery of major development sites and nationally significant infrastructure projects will help to ensure that predicted growth under the transformational scenario is achieved.

Long Term: Continued improvement in connectivity and the ongoing delivery of major development sites and nationally significant infrastructure projects will help to ensure that predicted growth under the transformational scenario is achieved.

Overall, it anticipated that this Strategic Component, in isolation, would enhance long term economic prosperity and promote economic transformation, resulting in **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Reg-Nat	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: This Strategic Component recognises that transport investment can stimulate other investment – residential, commercial and industrial and notes that growth strategies are under development centred on existing plans such as HS2. This Strategic Component also notes the critical role played by the transport network and it can be inferred that this would require coordination across sectors. Moderate beneficial effects are anticipated.

Medium Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them.

Long Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them.

Overall, this Strategic Component, in isolation, would help coordinate land use and strategic transport planning. **moderate beneficial** are anticipated.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓✓	Local-Reg	MT-LT	Perm	Low	++	++	++	++

Commentary

Short Term: This Strategic Component makes note of businesses being spread across the region, professional services located in all the North's towns and cities and the need to enhance connectivity for people across the North. It also recognises that TfN needs to determine interventions that will best support businesses in rural and urban economic centres across the North. Addressing the needs of all these areas should contribute to achieving a fairer society through providing greater equality of opportunity.

Medium Term: Implementation of this Strategic Component would continue to provide greater equality of opportunity across the North by continuing to enhance connectivity and support businesses in both rural and urban areas.

Long Term: Implementation of this Strategic Component would continue to provide a greater equality of opportunity across the North by continuing to enhance connectivity and support businesses in both rural and urban areas.

Overall, it is anticipated that this Strategic Component would result in a **moderate beneficial** effect in relation to this ISA Objective.

Mitigation / Recommendations

Mitigation Measures: See EqIA sub objective.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	++	++	++	++

Commentary

Short Term: This Strategic Component should result in business growth thereby making an increased number and range jobs more accessible to a greater range of people and will therefore potentially help achieve improvements in well-being and reduced inequalities in health through enhanced employment options, particularly for lower income groups. Although not specifically referenced in this Strategic Component, it is also possible that enhanced connectivity will provide greater access to both leisure and health facilities, thereby helping to reduce inequalities in health. Moderate beneficial effects are anticipated.

Medium Term: It is anticipated that implementation of this Strategic Component would continue to enhance connectivity and provide greater access to employment opportunities and leisure and health facilities, with moderate beneficial effects anticipated.

Long Term: It is anticipated that implementation of this Strategic Component would continue to enhance connectivity and provide greater access to employment opportunities and leisure and health facilities, with moderate beneficial effects anticipated.

Overall, implementation of this Strategic Component is anticipated to result in a **moderate beneficial** effect in relation to this ISA Objective.

Mitigation / Recommendations

Mitigation Measures: See HIA sub objective.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	?	?	+	+

Commentary

Short Term: Although new infrastructure or infrastructure improvements (such as road and rail) which could have an effect on community safety can be inferred from this Strategic Component, no note is made of these issues. As effects are would be dependent on the nature and location of interventions, they are thus anticipated to uncertain.

Medium Term: Effects (positive or negative) in the Medium Term would be dependent upon the nature and location of interventions. Anticipated effects therefore remain uncertain.

Long Term: Effects (positive or negative) in the Long Term would be dependent upon the nature and location of interventions. Anticipated effects thus remain uncertain.

Overall, it is anticipated that effects in relation to this Strategic Component in isolation, would be **uncertain**.

Mitigation

Mitigation Measures: See CSA sub objective. Also make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to safety, crime, etc.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: This strategic component takes note of businesses being spread across the region, professional services located in all our towns and cities and the need to enhance connectivity amongst businesses across the North. Whilst this has a business to business focus, it may make more jobs accessible to a wider range of people as it should be easier to travel to/from an increased number of destinations and employment centres. A consequence of this could also make other services such as community centres, faith centres and social clubs more accessible through these enhanced transport measures. Providing fully accessible services will particularly benefit those with disabilities or mobility impairments and those who are unconfident travellers such as children or the elderly.

The principle also recognises the need to be easier, cheaper, faster and more reliable to travel to and from the North's gateways. It also states the need for increasing the range of destinations and the frequency of direct international services to and from the North. This could improve the accessibility to jobs within the North to a wide range of people. This will particularly benefit those that are unemployed.

Medium Term: Developing the infrastructure significantly could allow a wider range of groups to access to a range of community and social services. Increasing the number of accessible jobs will provide benefits for a number of communities – particularly those without good access to a range of jobs, This will particularly benefit those communities with high levels of unemployment. Transport improvements are also likely to improve access to a range of other services and facilities such as community centres, faith centres, health and social clubs. A range of connectivity improvement initiatives will be programmes over the STP period, and therefore it is likely that greater benefits be felt in the medium term, compared to the short term as a result of the cumulative impacts of the programme.

Long Term: Longer term improved infrastructure could significantly could allow a wider range of groups to access a full range of community and social facilities. Increasing the number of accessible jobs will provide benefits for communities who may have not had good access to a range of jobs, or high levels of unemployment. This component also has the potential to improve access to a range of other amenities such as healthcare, education, community centres, faith centres and social clubs. As the transport measures and infrastructure will be programmed across the STP period it Is likely that greater benefits will be felt in the long term as a result of cumulative effects of the connectivity improvement initiatives.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure that any changes to improving provisions for cars or HGVs do not adversely impact the local population or those using the road network

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst this ISA Objective is focussed on connecting business improving connectivity and services is likely to have an impact on access to employment and services. Transport initiatives implemented as part of this strategic component may also provide a wider range of transport options, which may also be more affordable travel options for individuals (as well as businesses). This will particularly benefit those generally on more limited incomes (the elderly, those unable to work through disabilities or limiting conditions, those caring for young children and the unemployed).

This policy objective recognises cheaper travel to and from the North's gateways. Whilst not a direct impact of the component it has the potential to make travel to and from these areas more affordable and convenient to a wider range of people. This will be particularly important for lower income groups, which may include elderly people and those with disabilities.

Medium Term: As short term – although designed for business connectivity, improved transport links may provide more affordable transport options for individuals as well as businesses provided they are priced in line with other transport services/facilities. This should improve access to centres and the range of services they provide such as community facilities, faith centres and social and recreational facilities or education establishments.

Long Term: As short term - improved transport links may provide more affordable transport options for individuals as well as businesses provided they are priced in line with other transport services/facilities. This should improve access to strategic centres and therefore a range of services and amenities relevant to equalities groups which are found in these locations.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Any pricing schedules developed for new transport initiatives should be in line with existing pricing schedules in order to maximise accessibility for individuals (for access to employment and other services) as well as business to business travel.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: It is assumed any new infrastructure will have appropriate safety measures implemented in its design. Whilst this is aimed at connecting businesses, individuals who use these facilities may experience safety benefits and improvement on perceived safety and security issues. This will be particularly important for those groups who are known to experience disproportionate impacts of crime / fear of crime, including children, the elderly, females and BAME groups[37].

Medium Term: This will be similar to short term benefits; new infrastructure is likely to have appropriate safety considerations and therefore individuals who use the transport initiatives arising from this strategic component may experience a perceived improvement in safety and security as a result of new transport initiatives.

Long Term: As described in the short term - individuals who use the transport initiatives arising from this strategic component may experience perceived improvements in safety as a result of the new/enhanced facilities for connecting businesses.

[37] http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/inclusion/mef/publictransportneedsofminori3259

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures. Although the focus for this strategic component is business to business travel, individuals will also benefit from the transport initiatives.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Reg/ Nat	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network, therefore is unlikely to have any significant impact on safety in the short term. If increased freight is taken by rail and consequently there is a reduction in HGV levels on the road network there could be a reduction in accidents. Any new transport links may have mixed benefits in terms of accidents – an increase on the new links through attractiveness of the route, but a potential reduction on local roads through a reduction in traffic. It is assumed that safety would be a fundamental design feature of any new infrastructure and therefore would reduce the risk of accidents. The impact covers those using vehicles as well as pedestrians and cyclists travelling on the road network.

Medium Term: As with short term - the impacts on road safety are dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element.

Long Term: As with short term, the impacts on road safety are dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Measures to enhance safety for all road users should be central in the design of new infrastructure – maximising the safety benefits for drivers, pedestrians and cyclists.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network, and therefore is is considered unlikely that there will be any significant impact on severance in the short term. If increased freight is taken by rail and consequently there is a reduction in HGV levels on local roads, there could be a reduction in actual and perceived severance. Any new transport links have the potential to lead to an increase in actual or perceived severance if they are not designed effectively. Severance particularly impacts the elderly, the disabled and those with mobility issues as well as those who are unconfident travellers such as children.

Medium Term: As with short term, the impacts on severance are dependent on the new infrastructure developed, however mixed impacts are likely based on the redistribution of travel movements across the transport network as a result of new links/services and service enhancement.

Long Term: As with short term, the impacts on severance are dependent on the new infrastructure developed. However, mixed impacts are likely based on the potential redistribution of travel movements across the transport network as a result of new links/services and service enhancement.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance – particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓/✗	Local-Reg	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The strategic component involves enhanced connectivity by both the road and rail network. It is unlikely that there will be any significant impact on air, noise and light pollution in the short term as it will take time to implement new measures, and for there to be a change in travel behaviour/movement that will affect vibration and air, noise and light pollution.

Medium Term: Enhancements which create a mode shift from road to rail can have positive effects on air, noise and light pollution. However, creating new road links could have the opposite affect and increase vibration, air, noise and light pollution in certain areas. Mixed benefits are therefore considered likely in terms of air quality, noise and light pollution as the range of measures to enhance business to business connectivity is yet to be determined., it is expected that environmental impacts will be a key consideration of any new measures/infrastructure. In principle, the movement towards more sustainable travel should have a positive impact on the environment and therefore a positive impact for equalities groups through creating a more welcoming environment for work, education and social and recreational activities.

Long Term: As with medium term there may be some effects on vibration and air, noise and light pollution dependent on the enhancements. Mixed benefits are therefore considered likely in terms of air quality, noise and light pollution. These environmental effects will most likely be felt over the longer term, where it is considered that a shift towards more sustainable, automated travel will have a positive impact on the environment.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. schools. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

It is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: This strategic component takes note of businesses being spread across the region, professional services located in all our towns and cities and the need to enhance connectivity for people across the North. This could make more jobs accessible to a wider range of people as it will be easier to travel to/from an increased number of destinations and employment centres. A consequence of this could also make other services such as leisure, open space, and health more accessible.

The principle also recognises the need to be easier, cheaper, faster and more reliable to travel to and from the North's gateways. It also states the need for increasing the range of destinations and the frequency of direct international services to and from the North. This could improve the accessibility to jobs within the North to a wide range of people. This will particularly benefit those that are unemployed.

Medium Term: Developing the infrastructure significantly, although primarily for business connectivity, could provide secondary benefits of allowing a wider range of groups to access employment, leisure, health care services and other facilities such as open spaces. Increasing access to employment is likely to provide benefits for a number of communities, some of whom may not currently have good access to a range of jobs, health services and leisure facilities. This will particularly benefit those communities with high levels of unemployment.

Long Term: Longer term improved infrastructure could significantly could allow a wider range of groups to access services and facilities that have an impact on health and wellbeing (such as hospitals, open spaces, leisure and recreational facilities) as well as improving access to employment. Increasing the number of accessible jobs will provide benefits for a number of communities – particularly those currently without good provision, which in turn will have a positive impact on wellbeing.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local -Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term:

Whilst this ISA Objective is focussed on connecting business, it is likely to have an impact on access to employment and services. Connecting business is likely to involve providing a wider range of transport options. This in turn may present more affordable travel options for individuals as well as businesses, and hence improve health and wellbeing through more affordable access to a range of health facilities, open spaces and leisure and recreation facilities.

This policy objective recognises cheaper travel to and from the North's gateways. Whilst not a direct impact of the component it has the potential to make travel to and from these areas more affordable and convenient to a wider range of people. This will be particularly important for lower income groups, which may include elderly people and those with disabilities and limiting conditions. These groups are more likely to require access to healthcare.

Medium Term: As short term - improved transport links for business may also provide more affordable transport options for individuals, provided they are priced in line with other services. This should improve access to healthcare and other wellbeing services. It could take some time for new services to run to their capacity and reach their potential benefits, therefore there are likely to be increased benefits in the medium term compared to the short term.

Long Term: As short term - improved transport links for business may also provide more affordable transport for individuals provided they are priced in line with other services. Assuming these services are affordable, and priced in line with existing public transport services, this should improve access to healthcare and other wellbeing services. It could take some time for new services to run to their capacity and reach their potential benefits, therefore there are likely to be increase benefits in the long term compared to the short term benefits.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: The STP should seek to ensure that new transport initiatives to improve business connectivity are priced in line with existing transport options. This will ensure that the services not only provide benefits to businesses, but also to individuals who can use the initiatives to access employment, and also a range of facilities that will impact on health and wellbeing (i.e. health care services, open spaces, leisure and recreational facilities).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: It is assumed any new infrastructure or service considered within this strategy component will have appropriate safety measures embedded in its design. Whilst this strategy component is aimed at connecting businesses, individuals who are able to use the facilities may experience safety benefits (in terms of reduction in accidents or casualties) and an improvement on perceived safety and security issues (through measures such as lighting, CCTV etc.). Any improvement in accessibility of safe transport options may encourage those who currently feel unable to travel due to safety or security concerns to make essential journeys which will impact on their overall health and wellbeing. This may particularly impact those with disabilities, or the elderly who are known to have safety and security concerns when travelling, and whom are more likely to require frequent access to healthcare facilities.

Medium Term: It is assumed any new infrastructure will include appropriate safety measures. Whilst this strategy component is aimed at connecting businesses, new initiatives may be used by individuals accessing employment of health and wellbeing services, and therefore they may experience safety benefits and improvement on perceived safety and security issues

Long Term: It is assumed any new infrastructure will include a safety considerations. Whilst this is aimed at connecting businesses people who use these facilities may experience safety benefits and improvement on any perceived safety and security issues.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with communities such as hospital groups, the elderly, or disability groups would assist in identifying any existing safety and security concerns on current transport services/routes – this would then allow inclusion of suitable safety measures within new transport interventions, maximising benefits to individuals (for employment or other health and wellbeing access) as well as business connectivity.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Reg-Nat	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network, therefore is unlikely to have any significant impact on safety in the short term. If a larger proportion of freight is taken by rail compared to current levels, and consequently there is a reduction in HGV levels on the road, there could be a reduction in accidents. However, new transport links have the potential for mixed benefits in terms of accidents: whilst new transport links may result in more accidents, there may be a reduction in traffic on local roads (as a result of the new route becoming a more attractive option). It is assumed that safety would be a fundamental design feature of any new infrastructure and therefore minimise negative impacts on safety.

Medium Term: As with short term, the impacts on road safety will be mixed dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element.

Long Term: As with short term, the impacts on road safety will be mixed dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Safety measures should take into account the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local -Reg	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network to increase business connectivity. It is considered unlikely to have any significant impact on severance in the short term. If an increased proportion of freight is taken by rail, and consequently there is a reduction in HGV levels on the road, there could be a reduction in perceived severance – particularly on local roads. Any new transport links have the potential to lead to an increase in both actual and perceived severance issues if not placed sensitively. New transport links may have mixed impacts – an increase in actual/perceived severance on the new link if not placed considerately, but a potential reduction in severance on other roads through traffic transfer. Any changes in severance may impact on health through enabling / creating barriers to access healthcare services and facilities as well as employment.

Medium Term: As with short term, the impacts on severance are dependent on the new infrastructure developed to improve business connectivity, mixed benefits are likely based on redistribution of (freight and passenger) movements across the transport network.

Long Term: As with short term, the impacts on severance are dependent on the new infrastructure developed to improve business connectivity, mixed benefits are likely based on redistribution movements across the transport network.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Although this component is focussed on business connectivity, any new transport links/options should be fully appraised to ensure physical placement or wider impacts do not have adverse impacts on severance for local communities as this may lead to impacts on health (i.e. through restricting access to employment, health services of facilities).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local -Reg	LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network, therefore may have some impact on air, noise and light pollution in the short term.

Medium Term: Enhancements which create a mode shift from road to rail can have positive effects on air, noise and light pollution. However, creating new road links could have the opposite affect and increase vibration, air, noise and light pollution in local areas. It is expected that environmental impacts will be a key consideration of any new measures/infrastructure.

Long Term: As with medium term - there may be some effects on vibration and air, noise and light pollution dependent on the enhancements. These affects will most likely be felt over the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore, people which long term conditions, such as Asthma will be particularly vulnerable to areas increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: The principle involves enhanced connectivity by both the road and rail network, therefore is unlikely to have any significant impact on safety in the short term. If increased freight is taken by rail and consequently there is a reduction in HGV levels on the road network there could be a reduction in accidents. Any new transport links may have mixed benefits in terms of accidents – an increase on the new links through attractiveness of the route, but a potential reduction on local roads through a reduction in traffic. It is assumed that safety would be a fundamental design feature of any new infrastructure and therefore would reduce the risk of accidents. The impact covers those using vehicles as well as pedestrians and cyclists travelling on the road network.

Medium Term: As with short term, the impacts on road safety are dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element. It is considered that these are likely to be realised from the medium term onwards, although a potential increase in traffic levels could reduce the impact.

Long Term: As with short term, the impacts on road safety are dependent on the new infrastructure developed. It is assumed that any new infrastructure with have safety features as a fundamental design element, and these will be in operation in the long term. The potential increase in traffic in the long term may however limit benefit of these safety measures.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: In addition to road traffic, it is important that any new interchanges are safely accessible to pedestrians and cyclists.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: It is assumed any new infrastructure will have appropriate safety measures implemented in its design. Whilst this is aimed at connecting businesses, individuals who use these facilities may experience safety benefits and improvement on perceived safety and security issues. This will be particularly important for those groups who are known to experience disproportionate impacts of crime / fear of crime, including children, the elderly, females and BAME groups[38].

Medium Term: This will be similar to short term benefits; although it is assumed that there will be more elements in place in the medium term. New infrastructure is likely to have appropriate safety considerations and therefore individuals who use the transport initiatives arising from this strategic component may experience a perceived improvement in safety and security as a result of new transport initiatives.

Long Term: As described in the short term - individuals who use the transport initiatives arising from this strategic component may experience perceived improvements in safety as a result of the new/enhanced facilities for connecting businesses.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/facilities.

[38] http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/inclusion/mef/publictransportneedsofminori3259

G.4. Assessment of Strategic Component – Moving Goods

Table G-7 Strategic Component: Moving Goods – Description and Key Assumptions

Strategy Component: Moving Goods
Connectivity between the North's economic centres and assets Networks need to be accessible and resilient to accommodate the free-flowing movement of freight, enabling ports and airports to move goods and materials more efficiently. This would bring opportunities for more goods and materials to be processed in the North. The greater use of Northern ports could free up and reduce the reliance on significant miles of the Midlands and South East road and rail infrastructure, as well as the ports and airport capacities. Air freight has a significant economic value and plays a vital role for industries reliant on transporting high-value goods quickly around the globe (e.g. just-in-time services). While 11% of air freight is customs cleared in the North, only 4% is flown from the North. This reflects the dominance of the direct, long-haul passenger flights that provide most of the air-freight capacity. Increasing the North's direct air connections will support an increase in air-freight capacity. Increasing the opportunity for direct long-haul freight in the North will mean that fewer goods need to be transported across the UK and should reduce congestion and carbon emissions on north south corridors. **Multi-modal connectivity improvements** As is the case for the connectivity of people across the North, the connectivity of moving goods in the North can be improved, with new opportunities for the interchange with freight for road and rail. Ports also play a vital multi-modal role. Often favoured for bulky goods, inter-modal opportunities offer shippers the opportunity of bringing goods by sea to the North, then using either road, rail or inland waterways, such as the Manchester Ship Canal, to complete journeys in the most efficient way. However, the transport system of the North needs to ensure that specific requirements for freight on the road and rail networks are provided, include gauge clearances and freeing up freight paths on the rail network, and suitable roads for moving heavy goods down. There are currently no suitable routes across the Pennines that can accommodate the largest inter-modal deep sea shipping containers on standard wagons. Where freight movements are run by inter-modal services that need both road and rail access, road access needs to be resilient and accessible so that goods and vehicles can arrive and leave port or warehousing and storage areas promptly. **Delivering nationally significant infrastructure projects, major employment and major local development approvals** The North's ports are investing to cater for a greater share of the inter-modal freight market but their ability to compete is limited by the capacity of the rail network to accommodate more freight trains, and inadequate road access to move freight to and from the ports. Attractive market conditions must be created to enable the private sector expansion of airports and ports, and for shipping lines and airlines to improve international connectivity. **Cross border connectivity with the North's economic neighbours** TfN can make improvements to the North's transport network that will in turn support economic movement for people and goods from outside the North. The sections of the Major Roads Network that cross boundaries often provide national economic functionality through long-distance links on the trans-European road network, including the M6 north of Carlisle which connects to the ports of Glasgow, Stranraer and Cairnryan, and the A55/A494 through to the Port of Holyhead. **Supporting the international connectivity of the North** The North and its Airports and Ports have the ability to increase capacity to handle freight by both air and sea. The Independent International Connectivity Commission was of the view that securing more direct long haul passenger services would increase the ability to transport high value, time-sensitive air freight goods. This would enable businesses in the North to take advantage of increased productivity and speed, trading more directly and effectively with partners around the world making full use of our International Gateways. The North also needs to recognise and plan for the impact of the investments on the continent such as the Freight train originating in China which reduces the sea journey to Europe by 20 days. To ensure the whole end to end journey for freight is as efficient as possible, the North needs improved surface access connections to Ports and Airports which will enhance the 'last mile' of the journeys. This means creating better road connections and additional rail freight paths which will be explored as part of TfN's Strategic Transport Plan.
Key Assumptions *There is a full range of interventions possible under this strategic component. These are:* ***Highways*** • *New highway links* • *Highway infrastructure improvements* • *Smart highways / adaptive network*

Strategy Component: Moving Goods
Railways • *New rail links* • *Rail infrastructure improvements* • *Station upgrades* ***Public transport (excl. rail)*** • *Park and ride schemes* • *Station and interchange works* ***Enabling infrastructure*** • *EV facilitating* • *Smart / adaptive roads* • *Digital connectivity* ***Waterways*** • *Inland and coastal port upgrades* • *Use of canals*

Table G-8 Assessment of Strategic Components: Moving Goods

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✗	Local -Reg	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: This Strategic Component recognises that there are opportunities to reduce GHG emissions, e.g. through reducing the use of and congestion on North / South connections, or increased use or rail and even waterways for freight. However, there are also specific references within the Strategic Component to an increase in air travel and 'creating better road connections', which would not act to reduce GHG emissions. Moderate adverse effects are anticipated.

Medium Term: It is anticipated that a growth in road and rail would represent adverse effects on GHG emissions, though these could be reduced by the anticipated growth in LZEVs. It is therefore anticipated that effects would be slight adverse over the medium term.

Long Term: It is anticipated that a growth in road and rail would represent adverse effects on GHG emissions, though these could be reduced by the anticipated growth in LZEV use (it is a government aim for almost every car and van to be zero emission by 2050). It is therefore anticipated that effects would be slight adverse over the long term.

Overall, it is anticipated that this Strategic Component, in isolation, would result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions, including those relating to freight, have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. This Strategic Component notes the need for new transport interventions such as strategic park and ride facilities and interchanges. No note is made of biodiversity, though 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. Effects are therefore anticipated to be a mix of positive and adverse.

Medium Term: Effects, positive or negative, would be dependent upon the nature and location of the intervention.

Long Term: Effects, positive or negative, would be dependent upon the nature and location of the intervention.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Tables 2 and 3 and make cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This Strategic Component notes the need for new transport infrastructure such as strategic park and ride facilities and Interchanges. No note is made of sites designated for nature conservation, though there is a potential for effects (positive and negative) on these from the new / upgraded infrastructure, depending upon the nature and location of interventions. Effects are anticipated to be uncertain.

Medium Term: Effect, positive or negative, would be dependent upon the nature and location of interventions. Effects are therefore anticipated to be uncertain.

Long Term: Effects, positive or negative, would be dependent upon the nature and location of interventions. Effects therefore anticipated to remain uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, effects are **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity and the need to protect sites designated for nature conservation purposes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✘	Local-Reg	ST-LT	Perm	Med	--	-	-	-

Commentary

Short Term: The Freight Report recognises that there are air quality issues in town centres contributed to by HGV vehicles. Effects are anticipated to be medium adverse.

Medium Term: It is anticipated that a growth in road and rail would result in adverse effects on air quality, though these could be reduced by the anticipated growth in LZEV use. It is therefore anticipated that effects would be slight adverse.

Long Term: It is anticipated that a growth in road and rail would represent adverse effects on air quality, though these could be reduced by the anticipated growth in LZEV use (it is a government aim for almost every car and van to be zero emission by 2050). It is therefore anticipated that effects would be slight adverse over the long term.

Overall, it anticipated that this Strategic Component, in isolation, would result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: There are likely to be new and upgraded road and rail routes, along with freight interchanges and inland waterways under this strategic component. These will increase impermeable area which could potentially increase flood risk. This Strategic Component recognises that networks need to be accessible and resilient. While no specific reference to extreme weather events is made, it can be inferred that addressing these issues would include in relation to reliability / resilience under extreme weather. It is considered that this would represent slight beneficial effects.

Medium Term: As issues relating to the resilience of the North's transport system are addressed, it is anticipated that resilience to extreme weather events will increase, resulting in continued slight beneficial effects.

Long Term: As issues relating to the resilience of the North's transport system are addressed, it is anticipated that resilience to extreme weather events will increase, resulting in continued slight beneficial effects.

Overall, it is anticipated that this Strategic Component, in isolation, would result in **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local	ST-LT	Perm	Med	-	-	-	-

Commentary

Short Term: This Strategic Component notes the importance of ports and the potential for use of inland waterways, though no specific reference is made to the water environment. It is also anticipated that road and rail routes would be developed or upgraded. All these interventions could involve an increase in impermeable surfaces and the potential for pollution to occur during construction. Increased use of inland and coastal waterways for transport (for example, note is made of Liverpool 2 Deepwater Container Terminal) are likely to lead to potential pollution, both directly from vessels and from associated inland waterways. While precise effects will be dependent upon the nature and location of the intervention, it is considered that these will typically be slight adverse.

Medium Term: In the absence of appropriate mitigation development of interventions under this Strategic Component could have the potential to lead to slight adverse effects on the water environment and counteract initiatives being developed under the WFD to address water pollution.

Long Term: In the absence of appropriate mitigation development of interventions under this Strategic Component could have the potential to lead to slight adverse effects on the water environment and counteract initiatives being developed under the WFD to address water pollution.

Overall, it is anticipated that this Strategic Component, in isolation, would result in **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓/✗	Local -Reg	ST-LT	Perm	Med	+/-	+/-	+	+/-

Commentary

Short Term: New infrastructure or infrastructure improvements (such as road and rail) which could have an effect on soil or areas of contamination are anticipated under this Strategic Component. The Freight Report recommends that there is a series of Multi-Modal Distribution Parks (MDPs) developed (50ha / year) on edges of urban centres. Typically, soil in this urban fringe would be already impacted by urbanisation and these locations could offer opportunities for remediation of contaminated land.

Medium Term: A mix of effects (beneficial or adverse) are anticipated due to continued development of interventions under this Strategic Component.

Long Term: Effects are likely to become more beneficial as major interventions will have already been undertaken and a growth in smart mobility technology and LZEV use should lead to less pollution incidents. There would be continued opportunities to address issues such as invasive species.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local -Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: The full range of interventions anticipated under this strategic component could lead to a mix of beneficial or adverse effects on the setting of historic assets – for example, interventions could be developed adjacent to a historic site or these could relieve congestion in historic town centres e.g. from HGVs. It is anticipated that there will be a concentration of interventions in relative proximity to the major ports and this may affect historic industrial assets. Development of interventions in greenfield areas (such as the potential Multi-Modal Distribution Parks on the edge of urban centres) is more likely to encounter archaeological features that have not previously been disturbed by urban development and would have an adverse effect. In contrast, upgrades to existing infrastructure could provide an opportunity to refurbish or enhance features of industrial heritage e.g. canals, railway stations etc. As such it is considered effects on the historic environment are likely to be a mix of slight beneficial or adverse effects (with precise effects dependent on the nature and location of the intervention).

Medium Term: It is anticipated that continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Long Term: Continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas etc., but also through opportunities to enhance existing historic features.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/✗	Local-Reg	ST-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: It is anticipated that there will be a concentration of interventions in the vicinity of major ports. These are already likely to be heavily developed areas, often with significant industry and brownfield areas, and this may provide opportunities to enhance townscapes. Townscapes may also be enhanced through a reduction in congestion, e.g. from HGVs. However, this Strategic Component may also lead to the development of Multi-Modal Distribution Parks on the edges of urban areas (urban fringe), along with more long distance road and rail routes. These would represent new features in the landscape and could potentially have adverse effects, though precise effects will depend on location and type of intervention. On balance, it is anticipated that there would be a mix of slight beneficial and adverse effects.

Medium Term: It is anticipated that continued development of interventions would result in a mix of slight beneficial and adverse effects due to potential benefits to townscapes in port areas, but also due to the continued development in greenfield areas.

Long Term: Continued development of interventions would result in a mix of slight beneficial and adverse effects as above.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **a mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: Overall, this Strategic Component is seeking to increase efficiency of freight movement, by more direct movement within the North, and to/from North via ports and inter-regional movements, in particular reducing reliance on N-S movements to/from Southern ports (sea and air). This should result in overall increase in resource efficiency: less surface transport fuel and vehicles used, greater use of larger vehicles, especially sea freight, for more of the journey, and more efficient last-mile journeys around freight centres. It is anticipated that this would result in moderate beneficial effects.

Medium Term: Moderate beneficial effects are anticipated as efficiency grows through the development of interventions, for example further development of freight consolidation centres.

Long Term: Moderate beneficial effects are anticipated to continue as efficiency grows through the development of interventions, for example further development of freight consolidation centres.

Overall it is anticipated that in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓	Reg-Nat	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: This Strategic Component recognises that there are opportunities for lower carbon choice, e.g. through increased use of rail, waterways and sea for freight movement. The supporting Freight Report also notes the opportunities for LZEVs in last mile delivery. Development of MDPs of sufficient size and located on edge of urban centres is expected to make road freight movements more efficient (therefore reducing carbon). Cost reductions may also be anticipated, making rail and water modes more competitive and more affordable transport choices for goods. The Strategic Component also encourages a growth in freight by air, but it is recognised that this should have the effect of reducing congestion and carbon emissions on North-South corridors. It is therefore anticipated that there would be slight beneficial effects.

Medium Term: Trends in baseline conditions suggest that there should be an increase in LZEVs and these would be able to take advantage of better road connections under this Strategic Component. This should enhance lower carbon choice, with anticipated moderate beneficial effects.

Long Term: By 2050 it is estimated that there will be zero emissions from vans and significantly reduced HGV emissions, and these vehicles could benefit from better road conditions under this Strategic Component. It is anticipated that moderate beneficial effects will be maintained.

Overall, it is anticipated that this Strategic Component, in isolation, would result in **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Reg-Nat	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: This Strategic Component is concerned with the efficient movement of goods aimed at enhancing overall economic activity. Specific note is made of how TfN can make improvements to the transport network to support this. The Strategic Component is also strong on cross-border connections and their role in the economy.

Medium Term: Increased efficiency in the movement of goods, along with improvements in people movement, will continue to help businesses and long term economic prosperity.

Long Term: Increased efficiency in the movement of goods, along with improvements in people movement, will continue to help businesses and long term economic prosperity.

Overall, it is anticipated that this Strategic Component in isolation would enhance long term economic prosperity and promote economic transformation, resulting in **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Reg-Nat	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: This Strategic Component is concerned with moving goods and notes the need to 'improve the last mile' access connections to ports and airports. Effectively addressing these issues would require coordinated land use and strategic transport planning. This would likely result in slight beneficial effects at the local scale.

Medium Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them. Effects would continue to be confined to the local scale.

Long Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely getting stronger as they develop along with the knowledge that underpins them. Effects would continue to be confined to the local scale.

Overall, it is anticipated that this Strategic Component in isolation would help with coordination of land use and strategic transport planning. resulting in **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Cross reference is made in this Strategic Component to that related to the connectivity of people across the North and this connectivity of people is further referenced by the recognition that TfN can make improvements to the transport network that will in turn support economic movement of people from outside the North. This should have a slight beneficial effect on equality of opportunity.

Medium Term: Continued implementation of this Strategic Component will support slight beneficial increases in equality of opportunity for those across the North and cross border.

Long Term: Continued implementation of this Strategic Component will support slight beneficial increases in equality of opportunity for those across the North and cross border.

Overall, it is anticipated that this Strategic Component would result in a **slight beneficial** effect in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	++	++	++	++

Commentary

Short Term: This Strategic Component should result in business growth, thereby making an increased number and range of jobs more accessible to a greater range of people, and would therefore potentially help achieve improvements in well-being through enhanced employment options. Although not specifically referenced in this Strategic Component, it is also possible that enhanced connectivity would provide greater access to both leisure and health facilities, thereby helping to reduce inequalities in health.

Medium Term: Continued implementation of this Strategic Component should ensure an increased number and range of jobs remain accessible to a greater range of people. Greater access to leisure and health facilities should also continue.

Long Term: Continued implementation of this Strategic Component should ensure an increased number and range of jobs remain accessible to a greater range of people. Greater access to leisure and health facilities should also continue.

Overall, it is anticipated that this Strategic Component would result in **moderate beneficial** effects in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	?	Local-Reg	MT-LT	Perm	Low	?	?	?	?

Commentary

Short Term: Although new infrastructure or infrastructure improvements (such as road and rail) which could have an effect on community safety can be inferred from this Strategic Component, no note is made of these issues and the effect would depend on the nature and location of interventions. Effects are anticipated to be uncertain.

Medium Term: Effects, positive or negative, would be dependent upon the nature and location of interventions. Effects are anticipated to be uncertain

Long Term: Effects, positive or negative, would be dependent upon the nature and location of interventions. Effects are anticipated to be uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **uncertain** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the component to impact this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure that any changes to improving provisions for HGVs do not adversely impact the local population or those using the road network.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the component to impact this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: N/A

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the component to impact this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures. Although the focus for this strategic component is business to business travel, individuals will also benefit from the transport initiatives.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Reg-Nat	MT-LT	Perm	Low	0	+	+	+

Commentary

Short Term: This strategic component includes increasing the opportunity for water and air freight capacity, which would mean that fewer goods need to be transported across the UK by road. Consequently, this should reduce congestion and carbon emissions on north south corridors. Reducing the number of HGVs on the road could also reduce

conflict between HGVs and vulnerable users such as pedestrians and cyclists. In addition to being particularly beneficial for pedestrians and cyclists, children from more deprived areas are more likely to be involved in a road traffic collision, therefore a reduction in accidents should also be beneficial for people in deprived communities.

However, there is mention of 'better road connections', this could lead to an increase in HGV on road and consequently lead to an increase in accidents, conversely the policy also mentioned creating suitable roads to better encompass HGVs could make the roads safer for all road users.

Medium Term: Reducing the number of HGVs on the road could improve road safety for users, especially vulnerable users such as pedestrians and cyclists. If the rail freight infrastructure is developed, there could be increased safety benefits over the medium term. However, improving road connections may lead to an increase in HGV content on some roads. This could in turn increase the number of accidents due to the higher number of HGVs on the network.

Long Term: Long term, a continued reduction of HGVs on the road could lead to greater impacts on safety. However, these benefits will be dependent on the road enhancements, the location of these enhancements and the number of HGVs on these roads. An increase in the proportion of HGVs on roads in urban areas where there are high numbers of pedestrians and cyclists may lead to an increase in accidents.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure that any changes to improving provisions for HGVs do not adversely impact those using the road network, through worsening safety due to an increase in HGVs.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local -Reg	MT-LT	Perm	Low	0	+	+	+

Commentary

Short Term: This strategic component includes increasing the opportunity for water and air freight capacity mean that fewer goods need to be transported across the UK by road and this should reduce traffic on north south corridors.

Reducing the number of HGVs on the road network, especially in urban areas could reduce the perception of severance in many of the urban centres.

However, there is also mention of 'better road connections', which could lead to an increase in HGVs on the road. This has the potential to lead to an increase the percentage of HGVs on the road network which could in turn lead to a perceived increase in severance, due to busier roads.

Whilst the strategic component does not make specific reference to urban centres, this is where there would be the greatest effect on vulnerable groups.

Medium Term: Reducing the number of HGVs in the long term could have beneficial impacts on perceived severance, if over time the greater the number of HGVs that switch from road to rail, especially in urban areas.

Long Term: Redistributing the number of HGVs on specific road corridors could have long term effects on perceived severance on populations, this is particularly important for those people without a car, such as children and elderly people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Monitor the number of HGVs, to assess whether they are increasing on the road network. Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance – particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local -Reg	MT-LT	Perm	Low	0	+	+	+

Commentary

Short Term: The strategic component includes increasing the opportunity for water and air freight capacity, which means that fewer goods need to be transported across the UK by road and should reduce congestion and carbon emissions on north south corridors. A reduction in HGV traffic would benefit dense urban areas, and areas with high proportions of children (including around schools, nurseries and playgrounds). Children are particularly vulnerable to air and noise pollution, and people with respiratory problems (such as asthma) can be adversely impacted.

Medium Term: Reducing the number of goods transported by HGV across the UK will have increased benefits over the medium term compared to the short term. This is because it will take some time for the appropriate infrastructure to be implemented and up to full capacity. It is also a consideration that any road improvements may increase HGV traffic or redistribute the HGV traffic through different areas. The distribution of HGV vehicles needs to be a key consideration when designing transport schemes as areas with high proportions of some groups (such as children, older people, deprived people and those with disabilities) can be affected more than others.

Long Term: As with the medium term, there are different affects dependent on the specific measures undertaken. This is important as any affects attributed to redistribution of HGVs can have long term health effects on groups, such as children and lower income groups.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Monitor the number of HGVs, to assess whether they are increasing on the road network. If they are, air and noise pollution should also be monitored to ensure these are not being adversely affected. When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. schools. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

It is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the impact to increase under this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open

spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues). Ensure that enhancements tor rail freight travel do not affect or inhibit the rolling stock, which could have an impact on the public accessing facilities, services and amenities.

HIA-Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the component to impact this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: N/A

HIA-Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective.

Medium Term: There is very little potential for the component to impact this sub objective.

Long Term: There is very little potential for the component to impact this sub objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Ensure that any infrastructure changes being implemented do not adversely impact on the safety of the nearby population. For example, any change to routes which also impact pedestrian or cycle access should be fully considered (i.e. well lit with good visibility).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Reg-Nat	MT-LT	Perm	Low	0	+	+	+

Commentary

Short Term: The strategic component includes increasing the opportunity for water and air freight capacity, which will mean that fewer goods will need to be transported across the UK by road. This should reduce congestion and carbon emissions on north south corridors. Furthermore, reducing the number of HGVs on the road could potentially reduce conflict between HGVs and vulnerable users such as pedestrians and cyclists. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate

for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.

However, there is mention of 'better road connections', this could lead to an increase in HGV on road and consequently lead to an increase in accidents, conversely the policy also mentioned creating suitable roads to better encompass HGVs could make the roads safer for all road users.

Medium Term: Reducing the number of HGVs on the road could improve road safety for users, especially vulnerable users such as pedestrians and cyclists. If the rail freight infrastructure is developed there could be increased safety benefits over the medium term. However, improving road connections may lead to an increase in HGV content on some roads and could in turn lead to an increase in accidents.

Long Term: Long term a continued reduction of HGVs on the road, could lead to greater impacts on safety in the longer term. However, these benefits will be dependent on the road enhancements, the location of these enhancements and the number of HGVs on these roads. An increase in HGV content on roads in urban areas where there are high numbers of pedestrians and cyclists may lead to an increase in accidents.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

Monitor HGV flows and HGV collision involvements on the network, to assess whether they are becoming more common and if they are posing a threat to cyclists and pedestrians. Implement clear directional signage and route information for HGVs, to ensure they follow specified, suitable routes. This should mitigate HGVs using unsuitable local routes, and would divert them from vulnerable areas.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local -Reg	MT-LT	Perm	Low	0	+	+	+

Commentary

Short Term: The strategic component includes increasing the opportunity for water and air freight capacity mean that fewer goods need to be transported across the UK by road and this should reduce traffic on the north and south corridors.

Reducing the number of HGVs on the road network, especially in urban areas could reduce the perception of severance in many of the urban centres.

However, there is also mention of 'better road connections', this could lead to an increase in HGVs on the road. This has the potential to lead to an increase the percentage of HGVs on the road network which could in turn lead to a perceived increase in severance.

Whilst the strategic component does not make specific reference to urban centres, this is where there would be the greatest impact on vulnerable groups. Reducing severance has the potential to contribute towards a greater sense of place and encouraging active travel. This could consequently have a beneficial impact on health.

Medium Term: Reducing the number of HGVs in the long term could have beneficial impacts on perceived severance, if over time a number of HGVs switch from road to rail, especially in urban areas.

Long Term: Redistributing the number of HGVs on specific road corridors could have long term impacts to severance on populations, this is particularly important for those people without a car, such as children and elderly people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

Although this component is focussed on moving goods, any new transport links/options should be fully appraised to ensure physical placement or wider impacts do not have adverse impacts on severance for local communities as this may lead to impacts on health (i.e. through restricting access to employment, health services of facilities). It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible. HGV proportions in particular should be monitored.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: The strategic component includes increasing the opportunity for water and air freight capacity, meaning that fewer goods need to be transported across the UK by road, which should reduce congestion and carbon emissions on north south corridors. A reduction in HGV traffic in dense, urban areas would benefit, especially areas with a high proportion of schools, as children are particularly vulnerable to air and noise pollution.

Medium Term: Reducing the number of goods transported by HGV across the UK will have increased benefits over the medium term compared to the short term. This is because it will take time for the appropriate infrastructure to be implemented and for it to be used to its full capacity. It should also be considered that any road improvements may increase HGV traffic, or redistribute the HGV traffic through different areas. The distribution of HGV vehicles needs to be a key consideration when designing transport schemes as areas with high proportions of some groups can be affected more than others.

Long Term: As with the medium term, there are different affects dependent on the specific measures undertaken. This is important as any affects attributed to redistribution of HGVs can have long term health effects on groups, such as children, people with disabilities and limiting health problems.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity to move goods more efficiently, especially via road, is important to consider urban areas and areas with a high proportion of income deprived people. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution, and can consequently suffer health impacts, therefore, any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds). Furthermore, people with long term conditions, such as asthma will be particularly vulnerable to areas increases in air pollution.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This strategic component includes increasing the opportunity for water and air freight capacity, which would mean that fewer goods need to be transported across the UK by road. Consequently, this should reduce congestion and carbon emissions on north south corridors. Reducing the number of HGVs on the road could also reduce conflict between HGVs and users such as car drivers/passengers, pedestrians and cyclists.

However, there is also mention of 'better road connections', this could lead to an increase in HGV on road and consequently lead to an increase in accidents, conversely the policy also mentioned creating suitable roads to better encompass HGVs could make the roads safer for all road users.

Medium Term: Reducing the number of HGVs on the road could improve road safety for users. If the rail freight infrastructure is developed, there could be increased safety benefits over the medium term. However, improving road connections may lead to an increase in HGV content on some roads. This could in turn increase the number of accidents due to the higher number of HGVs on the network.

Long Term: Long term, a continued reduction of HGVs on the road could lead to greater impacts on safety. However, these benefits will be dependent on the road enhancements, the location of these enhancements and the number of HGVs on these roads.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Ensure that any changes to improving provisions for HGVs do not adversely impact those using the road network, through worsening safety due to an increase in HGVs.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This strategic component would have very little impact on this sub objective. Minor indirect benefits may be felt through reducing freight movements on the road network, reducing traffic and subsequently improving the overall environment for other travellers.

Medium Term: There is very little potential for the impact to increase this sub objective. As short term - minor indirect benefits may be felt through a reduction freight movement on the road.

Long Term: There is very little potential for the impact to increase this sub objective. As short term - minor indirect benefits may be felt through a reduction freight movement on the road.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures. Although the focus for this strategic component is moving goods, individuals may also benefit from the any transport initiatives if they are thoroughly considered.

G.5. Assessment of Strategic Component – Ensuring a Sustainable Investment Programme

Table G-9 Strategic Component: Ensuring a Sustainable Investment Programme – Description and Key Assumptions

Strategy Component: Ensuring a Sustainable Investment Programme
TfN and its Delivery Partners will ensure that strategic transport infrastructure is designed and constructed in a sustainable way. The principles set out below, build on the pan-Northern transport objectives, and will be developed over time to ensure TfN's Investment Programme becomes an exemplar in how it: • Defines a broad set of infrastructure requirements that will seek to deliver high quality travel with associated high quality environmental mitigation, to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North; • Acts as a catalyst for future transport technologies that will enable environmentally and efficient travel, contributing to the Government's target to reduce carbon emissions; • Promotes confidence in businesses to invest in a skilled labour market to deliver the transport infrastructure required, as well as supporting wider opportunities; and • Explores opportunities for 'green' and 'blue' infrastructure to enhance landscapes and habitats, and support a net gain in biodiversity where possible. **TfN's principles for pan-Northern transport investment** In time as the Strategic Transport Plan and long-term Investment Programme develops, TfN will work towards delivering infrastructure that supports these agreed principles for the sustainable delivery of transport in the North. This can be achieved in part through joint infrastructure planning with Delivery Partners, other statutory bodies, and wider stakeholders. TfN endorses the work being undertaken by Highways England and High Speed Two (HS2) Ltd through its Design Panels, as well as similar approaches by other Delivery Partners, to work towards delivering the best sustainable design through infrastructure development. TfN wants to work with its Delivery Partners to ensure projects in the North are designed to the objectives and principles set out in this Plan. New approaches could include encouraging new and/ or upgraded infrastructure to undertake sustainable procurement and be resource efficient, including promoting the circular economy, through exploring opportunities that can reduce the consumption of natural resources, such as soil, materials, energy, and water in construction, operation, and maintenance. Additionally, transport infrastructure should seek to minimise the contamination of land during construction, operation, and maintenance. Additionally, transport infrastructure should seek to minimise the contamination of land during construction, operation, and maintenance. TfN wants to encourage design, construction, repair and maintenance of transport infrastructure that respects and enhances the North's landscape character and townscapes. TfN will seek to ensure that these design principles are implemented in the development process for interventions on the Major Road Network and across the North's rail network. The North collectively, both public and private sector, needs to work towards a transport network that significantly reduces carbon emissions and harmful air pollutants, particularly CO2, NO2, particulates and noise. This will also improve air quality and support the North's contribution towards compliance with the UK's legal limits as soon as possible. This includes supporting and harnessing the uptake of ultra-low and zero emission technologies, as highlighted in the innovation section of the Strategic Transport Plan. This will also be a national priority with the Government's stated intention to ban new diesel and petrol vehicles from 2040. The Government's "Clean Growth Strategy – Leading the Way to a Low Carbon Future" sets out a series of key policies and proposals aimed at driving down carbon emissions over the next decade. The Strategy identifies transport, which accounts for 24% of UK emissions, as a key area for action, setting out a series of policy measures focused on accelerating the shift to low carbon transport. These include actions on introducing new vehicle technologies, on encouraging the shift of freight from road to rail and on working with the private sector to support research and development of connected and autonomous vehicles. TfN will need to work with Partners to ensure that the right infrastructure is in place for new low emission vehicles to be successful in the North, for example there needs to be a sufficient and appropriate charging and refuelling network in place. This also requires working with stakeholders in one of the North's prime capabilities in energy generation and supply to support this innovative change. Working with other statutory bodies, such as the Environment Agency, TfN wants to ensure the strategic transport network is future proofed, adaptive, and resilient. For example, TfN wants to ensure that Sustainable Drainage Systems (SuDS) such as green roofs, rain gardens or swales are incorporated in to the TfN's pipeline of investment to reduce flood risk. Additionally, working with Partners and other statutory bodies, TfN wants to deliver transport investments that protect sites designated for important nature conservation, ensure that due regard is given to the need to undertake archaeological investigations, and protect and enhance the quality and distinctiveness of historic assets. The North of England contains a number of statutory and non-statutory designated sites that are protected for their importance for nature conservation. Prime amongst these sites are Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which form the Natura 2000 European network of core breeding and resting sites for

Strategy Component: Ensuring a Sustainable Investment Programme
rare and threatened species, along with some rare natural habitat types. It is the aim of this network to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under the European Commission's Habitats and Birds Directives. In addition to the Natura 2000 sites, there are also internationally important wetlands designated as Ramsar sites. At a UK level, there are a large number of nationally important Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), and many important Local Nature Reserves (LNRs) and green spaces that support wildlife and enhance the wellbeing of the local population. The Strategic Transport Plan and Investment Programme recognises the importance of all these sites and TfN are committed to work with Partners to avoid and/or minimise any adverse impacts on important nature conservation sites as far as possible. Any potential direct or indirect impacts on these sites that may arise from new and/or upgraded transport interventions will be appropriately assessed, mitigated, and/or compensated for, in-line with existing best practice and relevant legislation across the life span of the Plan. This would include for European designated sites (including Ramsar sites), when necessary, Habitats Regulation Assessment. The North's strategic transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. This can ensure that communities across the North have opportunities to access work and leisure opportunities. These greater choices can also support work being undertaken by other organisations, such as Public Health England, to explore how investment in transport can have positive impacts on people's health. TfN also wants to work with Delivery Partners, the industry, professional institutions, and the Government to ensure that equality barriers are being overcome, and the talent and skills is available to delivery of TfN's long term Investment Programme. A transformation of the economy requires a transformation in the productivity of the workforce. This will also support the recommendations set out in the Government's Transport Infrastructure Skills Strategy. TfN wants to support diversity in transport, through encouraging and promoting the study of STEM subjects by students, so they can become the next generation of transport engineers, planners, and professionals. Additionally, more needs to be done to support and encourage more women, BAME, those with disabilities, and LGBT professionals in to the transport sector.
Key Assumptions *There are a full range of interventions possible under this strategic component. These are:* ***Highways*** • *New highway links* • *Highway Infrastructure improvements* • *Smart highways / Adaptive Network* ***Railways*** • *New rail links* • *Rail Infrastructure Improvements* • *Station upgrades* ***Public transport (excl. rail)*** • *Park & Ride schemes* • *Station and Interchange works* ***Enabling infrastructure*** • *EV Facilitating* • *Smart / Adaptive roads* • *Digital Connectivity* ***Waterways*** • *Inland and coastal port upgrades* • *Use of canals*

Table G-10 Assessment of Strategic Components: Ensuring a Sustainable Investment Programme

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓✓	Reg-Nat	ST-LT	Perm	Med	+++	+++	+++	+++

Commentary

Short Term: This Strategic Component notes the need to work towards a transport network that significantly reduces carbon emissions, and supporting and harnessing the uptake of ultra-low and zero emission technologies. The Strategic Component also notes that this will be a national priority. It is also the aim to ensure that the STP acts as a catalyst for future transport technologies that will enable environmentally sustainable and efficient travel, contributing to government targets to reduce carbon emissions. Specific commitment is stated to work with partners to ensure the right infrastructure is in place for new low emission vehicles to be successful, and note is also made of the need to work with stakeholders in the energy generation and supply sector to support this innovative change. It is anticipated that these measures would result in large beneficial effects.

Medium Term: This Strategic Component should continue to promote carbon reduction across the transport network, as well as playing a role in helping the uptake of low emission vehicles, for example by providing the key infrastructure required. This will help facilitate government predictions of 30% of new car sales being LZEVs by 2030. It is anticipated that these measures would continue to bring large beneficial effects.

Long Term: This Strategic Component should continue to promote carbon reduction across the transport network, as well as playing a role in helping the uptake of low emission vehicles, for example by providing the key infrastructure required. This will help facilitate government ambitions to have zero emissions from nearly every car and van by 2050.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, this Strategic Component sets out a clear commitment to support a net gain in biodiversity when possible and to explore opportunities for green infrastructure to enhance habitats. It is anticipated that effects will be slight beneficial overall.

Medium Term: Slight beneficial effects are anticipated to continue through the clear goal to support a net gain in biodiversity.

Long Term: Slight beneficial effects are anticipated to continue, through the clear goal to support a net gain in biodiversity.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	✓	Reg-Nat	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This Strategic Component clearly recognises the range of International Sites in the north of England and makes specific and clear reference to the need to protect these areas and avoid / minimise any adverse impacts on important nature conservation sites as far as possible. It notes that any potential direct or indirect impacts on these sites that may arise from new and / or upgraded transport interventions will be appropriately assessed, mitigated and or compensated for in-line with existing best practice and relevant legislation across the life span of the Plan. This would include for European designated sites (including Ramsar sites when necessary, Habitats Regulation Assessment. The clear commitment set out in this Strategic Component to protecting international sites is anticipated to result in overall slight benefits to this ISA Objective.

Medium Term: The clear commitment set out in this Strategic Component to protecting international sites is anticipated to result in overall slight benefits to this ISA Objective.

Long Term: The clear commitment set out in this Strategic Component to protecting international sites is anticipated to result in overall slight benefits to this ISA Objective.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3, and also note Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓✓	Local-Reg	ST-LT	Perm	Med	++	+++	+++	+++

Commentary

Short Term: Recognition is made of the need to work towards a transport network that significantly reduces harmful local air pollutants (particularly NO_2 and particulates) and commitment is made to support the North's contribution towards compliance with the UK's legal limits as soon as possible. This includes supporting and harnessing the uptake of ultra-low and zero emission technologies. Commitment is in place to help develop infrastructure for low emission vehicles. It is anticipated that these measures will result in moderate beneficial effects.

Medium Term: This Strategic Component should continue to play a role in helping the uptake of LZEVs, for example by providing the key infrastructure required. This will help facilitate government predictions of 30% of new car sales being LZEVs by 2030. It is anticipated that these measures would result in large beneficial effects.

Long Term: This Strategic Component should continue to play a role in helping the uptake of low emission vehicles, for example by providing the key infrastructure required. This will help facilitate government ambitions to have zero emissions from nearly every car and van by 2050.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓✓	Local-Reg	ST-LT	Perm	Med	+++	+++	+++	+++

Commentary

Short Term: It is known that the transport network is vulnerable to extreme weather events. This Strategic Component notes that TfN wish to ensure the strategic transport network is future proofed, adaptive and resilient, and examples are given of how flood risk reduction will be encouraged, e.g. use of SuDS. As time progresses and more data are collected, the Design Panels noted in the Strategic Component, and other similar mechanisms, should also help in development of better understanding of how climate is changing and ways to deal with this.

Medium Term: It is anticipated that the ongoing introduction of measures outlined such as SuDS would increasingly help protect the network from extreme weather events. Support for better understanding of issues via Design Panels and other similar mechanisms should also bring enhanced approaches to dealing with the issue.

Long Term: Ongoing introduction of measures outlined such as SuDS would increasingly help protect the network from extreme weather events (though it is to be noted these are expected to increase in frequency and intensity). Support for better understanding of issues via Design Panels and other similar mechanisms should also bring new enhanced approaches to dealing with the issue.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local-Reg	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Water quality is often severely impacted by transport activities. This Strategic Component notes the desire to explore opportunities in relation to 'blue' infrastructure, as well as explore opportunities to reduce the consumption of natural resources such as water. There is also a desire to ensure that SuDS are incorporated in the pipeline of investment. In addition to help reduce flood risk, SuDS are beneficial in terms of dealing with pollution and measures introduced as part of this STP would be complementary to measures being undertaken under the Water Framework Directive (WFD).

Medium Term: It is anticipated that ongoing introduction of SuDS would help to address many water quality objectives and is in keeping with measures outlined in the WFD.

Long Term: It is anticipated that ongoing introduction of SuDS would expand their use across the transport network, helping to address many water quality objectives, and is in keeping with measures outlined in the WFD.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: The Strategic Component notes a desire to explore opportunities to reduce the consumption of natural resources such as soil in construction and operation. Contaminated land would be addressed through the Design Panels and work toward delivering the best sustainable design through infrastructure development. It is a stated objective of this Strategic Component that the construction of transport infrastructure should seek to minimise the contamination of land during construction, operation and maintenance. This is expected to result in slight beneficial effects in the short term.

Medium Term: While there still may be some loss of soil to encroachment of transport infrastructure, this Strategic Component will minimise this and will also offer the opportunity for remediation of areas of contamination. Over time, the number of remediated areas will increase and other elements of the STP will help to reduce the potential for further pollution. This is anticipated to result in moderate beneficial effects.

Long Term: While there still may be some loss of soil to encroachment of transport infrastructure, this Strategic Component will minimise this and will also offer the opportunity for remediation of areas of contamination. Within this timeframe, the number of remediated areas will have increased, and this is expected to result in moderate beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: While implementation of the full range of transport interventions could have adverse effects on cultural heritage assets, specific mention is made of cultural heritage in this Strategic Component and of the need to protect and enhance the quality and distinctiveness of historic assets. It is also anticipated that the need to support the conservation and enhancement of cultural heritage assets would be addressed through Design Panels and work toward delivering the best sustainable design through infrastructure development. This would include taking opportunities to enhance features. It is also noted in this Strategic Component that due regard is to be given to the need to undertake archaeological investigations and this would increase understanding of cultural heritage.

Medium Term: Known sites will continue to receive protection and newly discovered assets (archaeology) will be investigated as appropriate. Encroachment / disturbance on assets from new or upgraded transport infrastructure would be addressed through Design Panels and other similar mechanisms. It is anticipated these measures would result in slight beneficial effects.

Long Term: Known sites will continue to receive protection and newly discovered assets (archaeology) will be investigated as appropriate and which will help to increase understanding of cultural heritage. Encroachment / disturbance on assets from new or upgraded transport infrastructure would be addressed through Design Panels and other similar mechanisms. It is anticipated these measures would result in slight beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Areas where landscape character is neglected or degrading are generally close to major centres of population and transport routes. Specific note is made within the Strategic Component to encourage design, construction, repair and maintenance of transport infrastructure that respects and enhances the North's landscape character and townscapes. This will work to protect and enhance the character and quality of landscapes and townscapes from new or upgraded transport infrastructure and opportunities for enhancement can be taken during maintenance, etc. It is anticipated that this would result in slight beneficial effects

Medium Term: This Strategic Component will continue to support to protection and enhancement of the character and quality of landscapes and townscapes from transport infrastructure. Over the medium term, screening will begin to mature and adverse effects reduce. Ongoing maintenance that respects and enhances landscapes and townscapes should ensure slight beneficial effects continue.

Long Term: This Strategic Component will continue to support to protection and enhancement of the character and quality of landscapes and townscapes from transport infrastructure. Screening will have fully developed by this stage and sensitive maintenance will be ongoing.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: The Strategic Component notes a desire to explore opportunities to reduce the consumption of natural resources such as materials and energy. It also notes that new approaches could include sustainable procurement, resource efficiency and promotion of the circular economy. These measures are anticipated to result in moderate beneficial effects.

Medium Term: In addition to continued exploration of opportunities to reduce consumption of materials, a greater understanding of new technologies and new approaches should be developed by Design Panels. This would continue to bring moderate beneficial effects.

Long Term: In addition to continued exploration of opportunities to reduce consumption of materials, a greater understanding of new technologies and new approaches should be developed by Design Panels. This would continue to bring moderate beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓✓	Reg-Nat	ST-LT	Perm	Med	++	+++	+++	+++

Commentary

Short Term: This Strategic Component notes the need to work towards a transport network that significantly reduces carbon emissions, and supporting and harnessing the uptake of ultra-low and zero emission technologies. The Strategic Component also notes that this will be a national priority. It is also the aim to ensure that the STP acts as a catalyst for future transport technologies that will enable environmentally sustainable and efficient travel, contributing to government targets to reduce carbon emissions. Specific commitment is stated to work with partners to ensure the right infrastructure is in place for new low emission vehicles to be successful and note is also made of the need to work with stakeholders in the energy generation and supply sector to support this innovative change. It is also stated that the transport network is to be inclusive and accessible and this is anticipated to include affordable.

Medium Term: This Strategic Component should continue to promote carbon reduction across the transport network, as well as playing a role in helping the uptake of low emission vehicles, for example by providing the key infrastructure required. This would help facilitate government predictions of 30% of new car sales being LZEVs by 2030.

Long Term: This Strategic Component should continue to promote carbon reduction across the transport network, as well as playing a role in helping the uptake of low emission vehicles, for example by providing the key infrastructure required. This would help facilitate government ambitions to have zero emissions from nearly every car and van by 2050.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: This Strategic Component is concerned with ensuring a sustainable investment programme and sets out to act as a catalyst for future transport technologies that will enable efficient travel, thereby aiding the economy through increased productivity. It is also an aim of this Strategic Component to promote confidence in business to invest in a skilled labour market to deliver the transport infrastructure required, as well as support wider opportunities. This will aid economic growth. Promotion of the circular economy under this Strategic Component will also act to help develop and support new economic sectors. It is also noted under this Strategic Component that TfN wants to encourage and promote STEM subjects. It is anticipated that effects will be slight beneficial.

Medium Term: This Strategic Component is anticipated to have moderate beneficial effects through continued encouragement of STEM subjects, further development of the circular economy and increased efficiency in the transport network.

Long Term: This Strategic Component should continue to have moderate beneficial effects through continued encouragement of STEM subjects, further development of the circular economy and increased efficiency in the transport network.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Reg-Nat	ST-LT	Perm	High	++	+++	+++	+++

Commentary

Short Term: Working with other statutory bodies is given considerable emphasis in this Strategic Component. For example, specific note is made of working with stakeholders. This is across the development spectrum and not confined to land use planning only. This is anticipated to result in moderate beneficial effects.

Medium Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely becoming stronger as they develop, along with the knowledge that underpins them.

Long Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely becoming stronger as they develop, along with the knowledge that underpins them.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: The Strategic Component aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. The Strategic Component also states that 'The North's transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services'. These aims should help improve access for all to a range of services such as faith centres, social care services and community centres, and be particularly important for people without a car which will include high proportions of children, older people, and people with disabilities.

Medium Term: Improving the accessibility to a range of services could have medium term beneficial effects as the infrastructure is improved and developed and there is an increase in uptake.

Long Term Improving the accessibility to a range of services could have long term beneficial effects as the infrastructure is improved and developed and uptake is maximised.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: The Strategic Component includes emphasis on creation of a healthier, safer and more inclusive strategic transport network. There is specific note made of promoting confidence in businesses to invest in a skilled labour market. There is also a recognition that the North's transport network needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. These measures should all help to promote greater quality of opportunity. The Strategic Component also recognises the need to reduce air pollutants harmful to health. It also includes commitment to supporting and harnessing the uptake of ultra-low and zero emission technologies. Introducing ultra-low and zero emission vehicle can enhance air quality and reduce noise pollution in the North.

Medium Term: Promoting LZEVs could have medium term beneficial effects, such as reducing air pollution, especially in urban areas, and this can have beneficial effects on health. Furthermore, increasing accessibility to services could enable people to reach a range of health care services more easily.

Long Term: There are likely to be beneficial effects in the long term arising from enhanced uptake of LZEVs and greater accessibility to services.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	++	++	++	++

Commentary

Short Term: Specific note is made of creating a safer and healthier strategic transport network. This will apply across the transport network and as such benefit those areas identified as being more impacted by crime.

Medium Term: Work undertaken by Design Panels should continue to be informed by the latest statistics on crime, new technologies to combat crime and new methods of dealing with crime. This should aid the promotion of community safety and continue to help reduce crime and the fear of crime.

Long Term: Work undertaken by Design Panels should continue to be informed by the latest statistics on crime, new technologies to combat crime and new methods of dealing with crime. This should aid the promotion of community safety and continue to help reduce crime and the fear of crime.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	LT	Temp	Low	++	++	++	++

Commentary

Short Term: The strategic component objective aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. The strategic component also states that 'The North's transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. This can ensure that communities across the North have opportunities to access employment, education, health and leisure opportunities.'

These aims will help improve access for all to essential services for health and wellbeing (employment, healthcare, food, leisure and recreation), and specifically for people without a car which will include high proportions of children, older people, and people with disabilities. This could also be to essential for those needing to reach healthcare services and leisure facilities, for those who previously would have had poor access.

Medium Term: Providing an inclusive and accessible environment is likely to have positive medium-term benefits for a range of people. The infrastructure put in place could increase the number of people who have a range of services easily accessible to them (i.e. healthcare, education, employment, leisure and recreation).

Long Term: These benefits will continue over the longer term, as the services more inclusive and accessible over time with the improved infrastructure. Good accessibility to a range of services will increase the number of opportunities for all user groups, specifically those who currently have limited travel options (low income, disabled, deprived).

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider both urban and rural areas, and specifically income deprived areas. Areas with higher deprivation are more likely to have higher proportions of people who live in no car households and have disabilities or limiting conditions. Therefore, improvements to public transport connectivity would be of particular benefit.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: A more inclusive strategic transport network, in order to maximise the benefits, should be affordable to all users, including those from low income groups. Whilst there is no specific pricing structure in place, there is recognition in the strategic component that the North's transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. Improving the affordability of services could be particularly beneficial to lower income groups which could include older people and people with disabilities, as it may allow a wider range of services to be available to them. This could include social clubs and community centres, as well as faith centres, education, employment and healthcare.

Medium Term: Affordability is not discussed within the component, however, an inclusive network which is accessible to all is assumed to take account of affordability of transport options. However, an inclusive network which is accessible to all is assumed to take account of affordability of transport options. Affordable measures would increase the opportunity and accessibility to a wide range of services and employment, particularly for those on low incomes.

Long Term: Cumulatively in the long term, improving the range of accessible transport options for all may have some affordability benefits. These are most likely to benefit those on low incomes, and those who do not have access to a car.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Benchmarking activities should be undertaken to ensure transport measures are affordable for all. In addition, research with low income groups could identify potential barriers to affordability and allow development of suitable pricing structures for those on low incomes to enhance access of opportunity for all.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	ST-MT	Perm	Med	+	+	+	+

Commentary

Short Term: The strategic component aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. It is expected any new infrastructure that involved investing in a more attractive environment could reduce perceived fear of crime and promote community safety. This could particularly benefit women, older people, LGBT groups, black and minority ethnic groups and people with a disability, as these will be more likely to have a more prevalent perception of safety and can be more susceptible to hate crimes.

Medium Term: Any improvements to infrastructure to create a more attractive, inclusive and accessible environment should promote community safety over the medium term, provided facilities are well maintained and have appropriate safety considerations embedded and maintained.

Long Term: Measures to create a more attractive, inclusive and accessible environment will continue into the long term through a programme of continued improvement. As with the medium term, benefits will only be realised if facilities are well maintained and have appropriate safety measures embedded and maintained.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Initiatives should enhance safety and security at all times and therefore consider lighting, visibility and other safety measures such as CCTV (where appropriate). Consultation with community groups will help to identify safety concerns, and suitable measures to remove these concerns and enhance actual and perceived safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: The strategic component aims to create a safer network. When creating a safer network, it is important to consider vulnerable user classes such as pedestrians, cyclists, older people and children in deprived areas. Any enhancement to public transport which could create a mode shift from car travel could have a beneficial impact on safety, by reducing the number of accidents. However, any improvements attracting vehicles or HGVs to roads, especially through dense areas which high proportions children and older people, could have adverse effects on safety. Road safety improvements would also benefit children, older people and those living in deprived areas, who are all more susceptible to being involved in a road traffic collision.

Medium Term: Creating a safer network may take time as the infrastructure needs to be developed, therefore there could be beneficial impacts in the medium term.

Long Term: The benefits are likely to be long term if there is a mode shift away from car and hence a continued reduction in car kilometres.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Liaising with relevant stakeholders such as the police and road safety officers, would improve knowledge of the types of accidents and provide advice on how to reduce them.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	ST-MT	Perm	Med	+	+	+	+

Commentary

Short Term: This strategic component does not mention anything specific which is likely to have a direct impact on severance. However, an environment which is attractive, inclusive, and accessible environment to live and work should take into account actual and perceived severance issues. Any new infrastructure should reduce traffic, enhance connectivity, create new/alternative transport options, and provide general environmental improvement to positively impact on severance.

Medium Term: Continued investment in an accessible and inclusive environment will continue to impact on actual and perceived severance. Well considered schemes / measures will reduce actual and perceived severance issues, and provide improvements to accessibility / environment which in turn will have positive health and wellbeing outcomes.

Long Term: As with the medium term there will be continued impacts on severance as a result of a programme of sustainable initiatives to enhance an accessible and inclusive environment.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	+++

Commentary

Short Term: The strategic component recognises the need to reduce carbon emissions and harmful pollutants. It also includes supporting and harnessing the uptake of ultra-low and zero emission technologies. Introducing ultra-low and zero emission vehicle can enhance air quality and reduce noise pollution in the North. People in deprived communities tend to experience poorer air quality because of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. It would also be beneficial to children as they a particularly susceptible to increase in noise and air pollution.

Medium Term: The overall aim is to enhance the overall environment and consider sustainable technologies and this will have an overall impact on pollution created through transport. Whilst supporting the uptake of zero emission vehicles will have short term benefits, the benefits are likely to be greater in the medium term. It will take time to phase in zero emission vehicles into the everyday environment.

Long Term: Benefits associated with creating a better environment through sustainable developments/initiatives are likely to be maximised in the long term as the uptake of new technologies and initiatives will take time and then the reduction of harmful air and noise pollutants, especially in deprived areas, will need time to disperse over many areas of the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity is important to consider urban and income deprived areas. Furthermore, children are particularly vulnerable to noise pollution, therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Med	++	++	++	++

Commentary

Short Term: The strategic component objective aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. The strategic component also states that 'The North's transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. This can ensure that communities across the North have opportunities to access work and leisure opportunities.

These aims will help improve access for all to essential services for health and wellbeing (employment, healthcare, food, leisure and recreation), and specifically for people without a car which will include high proportions of children, older people, and people with disabilities. This could also be to essential for those needing to reach healthcare services and leisure facilities, for those who previously would have had poor access.

Medium Term: Providing an inclusive and accessible environment is likely to have positive medium-term benefits for a range of people. The infrastructure put in place could increase the number of people who have a range of health and wellbeing services easily accessible to them (i.e. healthcare, leisure and recreation, open spaces) as well as a range of education and employment possibilities.

Long Term: These benefits will continue over the longer term, as the services become more inclusive and accessible over time with the improved infrastructure. Good accessibility to a range of services will have health benefits as well as increasing the number of opportunities for all user groups.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: A more inclusive strategic transport network, to maximise the benefits, should be affordable to all users, including those from low income groups. Whilst there is no specific pricing structure discussed, there is recognition in the strategic component that the North's transport network also needs to be designed and developed to be accessible and ensure users have an increased opportunity and choice of services. Improving the affordability of services could be particularly beneficial to lower income groups, as it may

allow a wider range of services to be available to them This could include health services and leisure facilities, and provide health benefits through generally increasing access of opportunity.

Medium Term: Affordability is not discussed within the component, however, an inclusive network which is accessible to all is assumed to take account of affordability of transport options. Affordable measures would increase the opportunity and accessibility to a wide range of health and wellbeing services, education and employment, the latter being particularly beneficial to improve the health and wellbeing of low income groups.

Long Term: Cumulatively, improving the range of accessible transport options for all may have some affordability benefits. These are most likely to benefit those on low incomes, and those who do not have access to a car.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: The STP should seek to ensure that new transport initiatives are priced in line with existing transport options, and promote accessibility for all – including those from low incomes – to encourage mode shift away from private vehicles. This will ensure that the services will provide individuals with affordable access to healthcare / wellbeing facilities, education and employment.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	ST-MT	Perm	Med	+	+	+	+

Commentary

Short Term: The strategic component aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. It is expected any new infrastructure that aims to create a more attractive environment will reduce fear of crime and promote community safety through embedded safety measures (i.e. appropriate lighting, visibility, CCTV etc.).

Medium Term: Building on the short term, any improvements to infrastructure and the creation of a more attractive environment are likely to promote community safety. These services should be well maintained and have appropriate safety measures embedded within their design that are fully inclusive (i.e. consider the safety considerations of a range of users, specifically, children, the elderly, BAME groups, those with disabilities, pedestrians and cyclists).

Long Term: Building on the medium term, improvements to infrastructure, to create an attractive, inclusive and accessible environment to live work and invest will have positive impacts on reducing crime and fear of crime. These benefits are likely to continue in the long term as the programme of measures/improvements progress.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: In order to reduce crime and fear of crime, it is important to ensure that environments are well lit, have good visibility and other appropriate safety measures to enhance the feeling of safety and security.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	ST-MT	Perm	Med	+	+	+	+

Commentary

Short Term: The strategic component aims to create a safer network. When creating a safer network, it is important to consider vulnerable user classes such as pedestrians, cyclists, older people and children in deprived areas. Any enhancement to public transport which could create a mode shift from car travel could have a beneficial impact on

safety, by reducing the number of accidents. However, any improvements attracting vehicles or HGVs to roads, especially through dense areas which high proportions children and older people, could have adverse effects on safety.

Medium Term: Creating a safer network, may take time as the infrastructure needs to be developed, therefore there could be beneficial impacts in the medium term.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: New infrastructure should be planned and designed with improving road safety as an overarching aim. This should include eliminating conflicts between traffic and vulnerable road users such as cyclists and pedestrians. A comprehensive communication and engagement strategy will help promote public transport changes and new services, which in turn will encourage mode shift away from cars, reducing the accidents rate per vehicle kilometre.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	ST-MT	Perm	Med	+	+	+	+

Commentary

Short Term: This strategic component does not mention anything specific which is likely to have a direct impact on severance. However, an environment which is attractive, inclusive, and accessible environment to live and work should take into account actual and perceived severance issues, and reduce these. Any new infrastructure should reduce traffic, enhance connectivity, create new/alternative transport options, and provide general environmental improvement to positively impact on severance.

Medium Term: Continued investment in an accessible and inclusive environment will continue to impact on actual and perceived severance. Well considered schemes / measures will reduce actual and perceived severance issues, and provide improvements to accessibility / environment which in turn will have positive health and wellbeing outcomes.

Long Term: As with the medium term there will be continued impacts on severance as a result of a programme of sustainable initiatives to enhance an accessible and inclusive environment.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important to appraise specific schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓✓	Local-Reg	LT	Perm	Med	++	++	+++	+++

Commentary

Short Term: The strategic component recognises the need to reduce carbon emissions and harmful pollutants. It also includes supporting and harnessing the uptake of ultra-low and zero emission technologies. Introducing ultra-low and zero emission vehicle can enhance air quality and reduce noise pollution in the North. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. It would also be beneficial to children and those with limiting health problems.

Medium Term: Whilst supporting the uptake of zero emission vehicles will have short term benefits, the benefits are likely to be greater in the medium term. It will take time to phase in zero emission vehicles into the everyday environment.

Long Term: Benefits are likely to be maximised in the long term as the uptake of new technologies and initiatives will take time and then the reduction of harmful air and noise pollutants, especially in deprived areas, will need time to disperse over many areas of the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity, it is important to consider urban and income deprived areas in particular. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are more likely to suffer the health impacts of it. Therefore, any improvements would benefit them in particular. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds). Furthermore, people with long term health conditions, such as asthma will be particularly vulnerable to areas that have high quantities of air pollution.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: The strategic component aims to create a safer network. When creating a safer network, it is important to consider vulnerable user classes such as pedestrians, cyclists, older people and children in deprived areas. Any enhancement to public transport which could create a mode shift from car travel could have a beneficial impact on safety, by reducing the number of accidents. However, any improvements attracting vehicles or HGV's to roads, especially through dense areas which high proportions children and older people, could have adverse effects on safety. Road safety improvements would also benefit children, older people and those living in deprived areas, who are all more susceptible to being involved in a road traffic collision.

Medium Term: Creating a safer network may take time as the infrastructure needs to be developed, therefore there could be beneficial impacts in the medium term.

Long Term: The benefits are likely to be long term if there is a mode shift away from car and hence a continued reduction in car kilometres.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures. Although the focus for this strategic component is business to business travel, individuals will also benefit from the transport initiatives.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: The strategic component aims to create an attractive, inclusive, and accessible environment to live, work and invest, for a healthier, safer, more inclusive strategic transport network across the North. It is expected any new infrastructure that involved investing in a more attractive environment could reduce perceived fear of crime and

promote community safety. This will be particularly important for those known to experience safety and security issues such as children, older people, disabled, females and BAME groups.

Medium Term: Any improvements to infrastructure, creating a more attractive, inclusive and accessible environment should promote community safety over the medium term, provided facilities are well maintained and have appropriate safety considerations embedded and maintained.

Long Term: Measures to create a more attractive, inclusive and accessible environment will continue into the long term through a programme of continued improvement. As with the medium term, benefits will only be realised if facilities are well maintained and have appropriate safety measures embedded and maintained.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, LGBT, females, BAME groups) would allow suitable safety measures to be implemented within any new services. When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

G.6. Assessment of Strategic Component – Integrated and Smart Travel

Table G-11 Strategic Component: Integrated and Smart Travel – Description and Key Assumptions

Strategy Component: Integrated and Smart Travel
TfN is working in partnership with operators, transport authorities and the Department for Transport to deliver a scheme that will make it easier for passengers to travel seamlessly using their preferred payment method, confident that they have paid the best possible on the day fare for their journey. Customers can already use a smartcard, contactless bank card or their smartphone to pay for travel by public transport in parts of the North of England. The Integrated and Smart Travel programme will build on existing systems to develop smart ticketing, payment and information technologies to transform travel across the whole region. A world class transport system should be supported by a payment and information system that makes it simple and easy to travel around and between city regions for both work and leisure. Passengers will be able to plan journeys, view fare information and know the different options as well as benefiting from a 'fair price promise' when travelling across all operators and modes of travel in the North. To achieve this, the Integrated and Smart Travel programme is working to deliver a programme that will make travel by rail, bus and light rail travel simple, attractive and convenient. • Enabling economic growth in the North – increasing public transport use, freeing capacity on road networks and providing customers with access to a wider jobs market; • Improving customer experience – Allowing seamless multi-modal travel, reducing queuing times, improving journey and pricing information and ensuring value for money; • Increasing efficiency across the transport network – Improving accuracy and timeliness of travel information, reducing operational costs, reducing fraud and easing congestion on roads; and • Providing a consistent and familiar travel experience throughout the North – TfN can work with transport operators and local transport authorities to simplify fare structures and ticket types across the North. The programme will be delivered in three concurrent phases over the next four years. The Integrated and Smart Travel programme is significantly underway, with Strategic Outline, Outline and Full Business Cases having been completed for various phases over the previous year. The programme includes a number of 'quick wins' as well as a series of 'pilot projects' to provide valuable insight for longer term plans.

Table G-12 Assessment of Strategic Components: Integrated and Smart Travel

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓✓	Reg-Nat	ST-LT	Perm	Med	++	++	++	++
Commentary **Short Term:** It is stated that this Strategic Component will help to increase efficiency on the transport network and help to ease congestion on the road network, as well as increase public transport use. This would have the effect of reducing GHG emissions as people are attracted onto public transport through measures such as payment convenience, accurate travel information, fair price promise, etc. and it is anticipated this would have a moderate beneficial effect on GHG emissions. **Medium Term:** Continued role out of the measures under this Strategic Component is anticipated to continue to result in moderate beneficial effects as greater numbers of people would be attracted to use the public transport network and move away from use of private cars. **Long Term:** Uptake of smart mobility technology (passenger and goods use) would likely reduce congestion over the long term as well as overall road travel kilometres, with moderate beneficial effects on GHG emissions. This would be enhanced by expected uptake of LZEV use over this timeframe. Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.									
Mitigation **Mitigation Measures:** See Mitigation Table 1.									

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+
Commentary **Short Term:** While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim that will help to increase efficiency on the transport network and help to ease congestion on the road network, as well as increase public transport use. This could lead to potential slight beneficial effects for this ISA Objective, due to reduced air, water and light pollution, noise and vibration from road transport. **Medium Term:** Continued role out of the measures under this Strategic Component is anticipated to continue to result in slight beneficial effects. **Long Term:** Continued role out of the measures under this Strategic Component is anticipated to continue to result in slight beneficial effects. This would be enhanced by expected uptake of LZEV use over this timeframe. Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.									
Mitigation **Mitigation Measures:** See Mitigation Table 2, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity.									

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	✓	Reg-Nat	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim that will help to increase efficiency on the transport network and help to ease congestion on the roads, as well as increase public transport use. This could lead to potential slight beneficial effects for this ISA Objective, due to reduced air, water and light pollution, noise and vibration from road transport.

Medium Term: Continued role out of the measures under this Strategic Component is anticipated to continue to result in slight beneficial effects.

Long Term: Continued role out of the measures under this Strategic Component is anticipated to continue to result in slight beneficial effects. This would be enhanced by expected uptake of LZEV use over this timeframe.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 3, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to Biodiversity and the need to protect sites designated for nature conservation purposes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: It is stated that this Strategic Component will help to increase efficiency on the transport network and help to ease congestion on the road network, as well as increase public transport use. This would have the effect of reducing air pollutant emissions as people are attracted on to public transport through measures such as payment convenience, accurate travel information, fair price promise, etc. and it is anticipated this would have a moderate beneficial effect on air quality.

Medium Term: Continued role out of the measures under this Strategic Component are anticipated to continue to result in moderate beneficial effects as greater numbers of people would be attracted to use the public transport network and move away from use of private cars.

Long Term: Uptake of smart mobility technology (passenger and goods use) would likely reduce congestion over the long term as well as overall road travel kilometres, with moderate beneficial effects on air quality. This will be enhanced by expected uptake of LZEV use over this timeframe.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓	Local-Reg	ST-LT	Perm	Low	++	++	++	++

Commentary

Short Term: This Strategic Component is concerned with Smart (Digital) travel. This could include measures or initiatives capable of communicating up-to-date travel information to users of the transport network during extreme weather events. This would allow travellers to plan their journey with greater accuracy, e.g. perhaps by utilising a different route or mode during these events, and would represent a moderate beneficial effect.

Medium Term: Moderate beneficial effects are anticipated to continue as the application and accessibility of smart initiatives continues, with a greater number of people being able to utilise this approach.

Long Term: Moderate beneficial effects are anticipated to continue as the application and accessibility of smart initiatives continues, with a greater number of people being able to utilise this approach.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 5, and cross reference to 'Ensuring a Sustainable Investment Programme' which will further address issues relating to a changing climate.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local-Reg	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim to ease congestion on the road and increase public transport use. Therefore, it is anticipated that a greater number of journeys would be made by public transport and this would reduce congestion on the road network. This could reduce the potential for accidental release of hydrocarbons, or reduce the amount of polluted road runoff. As such, it is anticipated that slight beneficial effects would be experienced.

Medium Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles. Note that effects would be enhanced by the anticipated uptake in LZEV.

Long Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles. Note that effects would be enhanced by the anticipated uptake in LZEV.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 6, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to the water environment.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim to ease congestion on the roads and increase public transport use. Therefore, it is anticipated that a greater number of journeys would be made by public transport and this would reduce congestion on the road network, with a potential reduction in contamination occurring through accidental spillages of pollutants. As such, it is anticipated that slight beneficial effects would be experienced.

Medium Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles. Effects would likely be enhanced by the anticipated uptake in LZEV.

Long Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles. Effects would likely be enhanced by the anticipated uptake in LZEV.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to soil and contamination.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim to ease congestion on the road network and increase public transport use. Therefore, it is anticipated that there would likely be less congestion in historic town centres, as well as potentially on roads in proximity to other heritage assets. This would represent a slight beneficial effect.

Medium Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles and less congestion in town centres or in proximity to historic sites.

Long Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles and less congestion in town centres or in proximity historic sites.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to historic and cultural heritage assets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim that will help to increase efficiency on the transport network and help to ease congestion on the road network, as well as increase public transport use. This is anticipated to have a beneficial effect on landscapes and townscapes. However, development of infrastructure to support smart technology may have an adverse effect, though it may be the case that this technology could 'piggy back' on existing infrastructure. It is anticipated that there would be a mix of slight beneficial and slight adverse effects.

Medium Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles and consequent less congestion. Potential slight adverse effects are anticipated through the development of supporting smart technology infrastructure.

Long Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use by private vehicles and consequent less congestion. Potential slight adverse effects are anticipated through the development of supporting smart technology infrastructure.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to landscape and townscape assets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: While this Strategic Component is concerned with Smart (Digital) travel, it is a stated aim that will help to increase efficiency on the transport network and help to ease congestion on the road network, as well as increase public transport use. A reduction in congestion is anticipated to result in a more prudent use of natural resources (hydrocarbons) and would be considered a slight beneficial effect. Effects on waste and opportunities for re-use / recycling would be minimal and mainly confined to the development phase of supporting infrastructure. To the extent that provision of new / expanded road infrastructure is avoided and/or offset by more resource efficient (per travel kilometre) rail or water transport, there would likely be beneficial effects for this ISA objective.

Medium Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use and the easing of congestion, avoidance of road infrastructure and/or offsetting with rail or water transport. This effect may lessen as expected uptake of LZEV continues.

Long Term: Slight beneficial effects are anticipated to continue due to a relative reduction in road use and the easing of congestion, avoidance of road infrastructure and/or offsetting with rail or water transport. This effect may lessen as expected uptake of LZEV continues.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓✓	Reg-Nat	ST-LT	Perm	Med	+++	+++	+++	+++

Commentary

Short Term: A stated aim within this Strategic Component for a 'fair price promise', along with other measures to improve the customer experience and which would ensure value for money, would help to enhance affordable transport choice on public transport. A second stated aim of this Strategic Component is to reduce road congestion and increase the use of public transport. This would constitute enhanced lower carbon transport choice over private cars (assuming fossil fuelled). It is anticipated this would result in large beneficial effects in relation to this ISA Objective. The timeframe in which measures are anticipated to be implemented means benefits will be experienced immediately.

Medium Term: Large beneficial effects will continue to be experienced due to the implementation of this Strategic Component. As technology changes, effects could be even more enhanced, with a greater number of people utilising public transport as a result.

Long Term: Large beneficial effects will continue to be experienced due to the implementation of this Strategic Component. As technology changes, effects could be even more enhanced, with a greater number of people utilising public transport as a result.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: It is a stated aim of this Strategic Component to enable economic growth in the North. This is to be achieved by increasing public transport use, freeing capacity on road networks and providing customers with access to a wider job market. It is anticipated this will have moderate beneficial effects.

Medium Term: Increasing public transport use, freeing capacity on road networks and providing customers with access to a wider job market will continue to result in moderate beneficial effects.

Long Term: Increasing public transport use, freeing capacity on road networks and providing customers with access to a wider job market will continue to result in moderate beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Local-Reg	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: This Strategic Component states that TfN is working in partnership with operators, transport authorities and the Department for Transport to deliver this range of interventions. Although these bodies are not directly involved in land use planning, this does indicate the aim to engage with other bodies for the most effective implementation.

Medium Term: It is anticipated that the ongoing implementation of this Strategic Component would result in ongoing slight beneficial effects through further coordination with other statutory bodies.

Long Term: It is anticipated that the ongoing implementation of this Strategic Component would result on ongoing slight beneficial effects through further coordination with other statutory bodies.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Greater equality of opportunity could be promoted by the 'Fair Price Promise' and the measures taken to enhance value for money. A wider group of people would also benefit from the range of measures designed to make the public transport network more attractive. It is anticipated that this will result in Slight Beneficial effects.

Medium Term: Ongoing implementation of this Strategic Component would result in Slight Beneficial effects due to the promotion of the 'Fair Price Promise' and the measures taken to enhance value for money etc.

Long Term: Ongoing implementation of this Strategic Component would result in Slight Beneficial effects due to the promotion of the 'Fair Price Promise' and the measures taken to enhance value for money etc.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 14 and HIA sub-objectives.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: An increase in public transport as pursued by this Strategic Component would mean that people would be more active in their travel as opposed to using the private car. This would provide the opportunity to improve health and well-being. It is anticipated effects would be slight beneficial.

Medium Term: Ongoing implementation of this Strategic Component would result in slight beneficial effects due to ongoing encouragement of more active travel options.

Long Term: Ongoing implementation of this Strategic Component would result in Slight Beneficial effects due to ongoing encouragement of more active travel options.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15 and EqIA sub-objectives

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: It is the intention that this Strategic Component will attract more people to use public transport, but no note is made of the promotion of safety or the need to reduce crime / the fear of crime, with the exception of aiming to reduce fraud. Promoting seamless multi-modal travel, reducing queuing times and enhancing the overall customer experience on public transport may also have community safety and crime reduction benefits. It is anticipated that implementation of this Strategic Component would likely result in slight beneficial effects.

Medium Term: Ongoing implementation of this Strategic Component would likely continue to result in slight beneficial effects.

Long Term: Ongoing implementation of this Strategic Component would likely continue to result in slight beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation / Recommendations

Mitigation Measures: See CSA sub objectives.

Recommendations: Cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to community safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Med	++	++	++	++

Commentary

Short Term: Integrated and smart travel should make public transport more attractive and easier to use. This could therefore encourage more people to use public to travel to a wider range places across the North. This would therefore potentially increase accessibility to a wider range of employment and services, such as healthcare, recreation and faith and community centres.

Medium Term: The component is planned for delivery within the short term, however continued benefits will be seen in the medium term, as ticket and travel becomes increasingly integrated and accessible.

Long Term: These benefits will continue over the longer term, as the uptake of travel becomes increasingly integrated and the uptake reaches its full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Proposals should ensure a programme of education on the ticketing and how to purchase and use it. This will be particularly important for groups who may not use technology, for example the disabled or older people. Appropriate information and education approaches should be used to maximise potential of the component.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	ST-MT	Perm	Med	++	++	++	++

Commentary

Short Term: A more integrated and inclusive ticket system, to maximise the benefits, should be affordable to all users, including those from low income groups. Whilst there is no specific pricing structure discussed, there is mention of an integrated, seamless and simplified ticket structure. Providing an integrated, seamless and simplified ticketing system, including improved ticketing and information, should enable people to have more choices and better-informed travel choices, therefore making it easier for people to choose the best and cheapest option for them. This improved ticketing may reduce the need for people to buy multiple tickets. Improving the affordability of services could be particularly beneficial to lower income groups, as it may allow a wider range of services to be available to them This could include health services and leisure facilities, and provide health benefits through generally increasing access of opportunity.

Medium Term: The component is planned for delivery within the short term, however continued benefits will be seen in the medium term. Affordable transport would increase the opportunity and accessibility to a wide range of employment opportunities, healthcare, leisure and recreational services and education facilities.

Long Term: The component is planned for delivery within the short term, however continued benefits will be seen in the long term – particularly for those on low incomes, and those who do not have access to a car.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: The STP should seek to ensure that new transport initiatives are priced in line with existing transport options, and promote accessibility for all – including those from low incomes – to encourage mode shift away from private vehicles. This will ensure that the services will provide individuals with affordable access to healthcare / wellbeing facilities, education and employment.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst this sub-objective is not a main aim of the strategic component, introducing smart ticketing and payment, will reduce the time taken at stations/stops purchasing tickets, and real time information on services may reduce times at stops/interchanges. This in turn is likely to provide some safety benefits, particularly in areas of high crime. This could be particularly beneficial for those who are most susceptible to perceived fear of crime and hate crimes, which includes, BAME populations, LGBT groups, women and those with disabilities.

Medium Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the medium term through reduced wait times at interchanges/stops/stations.

Long Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the long term through reduced wait times at interchanges/stops/stations.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: In order to reduce crime and fear of crime, it is important to ensure that public transport services / stations / environments are well lit, have good visibility and other appropriate safety measures to enhance the feeling of safety and security.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: An integrated, smart and simplified ticketing system increases the attractiveness of public transport and therefore, encourage car drivers to switch to public transport. This could reduce the number of cars in local areas, or on certain road corridors, reducing the number of accidents. This is particularly beneficial for vulnerable road users, such as pedestrians and cyclists.

Medium Term: As infrastructure and smart ticketing is embedded in the medium term, there could be a continued mode shift to public transport and therefore, a potential reduction in accidents.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: A comprehensive communication and engagement strategy will help promote public transport changes and new services, which in turn will encourage mode shift away from cars, reducing the accidents rate per vehicle kilometre.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: An integrated, smart and simplified ticketing system should increase the attractiveness of public transport and therefore, encourage car drivers to switch to public transport. This could reduce the number of cars in local areas, or on certain road corridors, rand therefore potentially make improvements to actual or perceived severance in the area. This in turn may provide more access of opportunity, particularly for those groups who are known to be more likely to experience impacts of severance (children, older people and those with mobility impairments or disabilities).

Medium Term: As infrastructure and smart ticketing is embedded further from the short term, there could be a continued mode shift to public transport and therefore, a reduction in congestion resulting in improvements to feelings of severance associated with road traffic.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: It is important to appraise specific schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓✓	Local-Reg	LT	Perm	Med	++	++	++	++

Commentary

Short Term: Making public transport ticketing easier and more attractive could create a mode shift from private vehicle to public transport. This could therefore reduce air and noise pollution in certain areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. It would also be beneficial to children and those with limiting health problems.

Medium Term: As integrated travel measures are further embedded in travel behaviour, a continual mode shift away from private vehicles may continue to provide environmental impacts in the medium term, and hence make improvements to the overall environment and subsequently access of opportunity.

Long Term: Benefits are likely to continue in the long term as the system is further embedded in travel behaviour and there is a continued mode shift to public transport. The reduction of harmful air and noise pollutants from private vehicles, especially in deprived areas, will need time to disperse over many areas of the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban and income deprived areas in particular. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are more likely to suffer the health impacts of it. Therefore, any improvements would benefit them in particular. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds). Furthermore, people with long term health conditions, such as asthma will be particularly vulnerable to areas that have high quantities of air pollution.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Med	++	++	++	++

Commentary

Short Term: Integrated and smart travel should make public transport more attractive and easier to use, this could therefore, encourage more people to use public to travel to a wider range places across the North. This would therefore, open up a wider range of employment and services (such as healthcare, wellbeing services) to a larger range of people.

Medium Term: The component is planned for implementation over the next 4 years. Over the medium term, as ticket and travel becomes increasingly integrated and accessible, this should have continued beneficial effects.

Long Term: These benefits will continue over the longer term, as the uptake of travel becomes increasingly integrated and the uptake reaches its full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Proposals should ensure a programme of education on the ticketing and how to purchase and use it. This will be particularly important for groups who may not use technology, for example the disabled or older people. Appropriate information and education approaches should be used to maximise potential of the component.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	ST-MT	Perm	Med	++	++	++	++

Commentary

Short Term: A more integrated and inclusive ticket system, to maximise the benefits, should be affordable to all users, including those from low income groups. Whilst there is no specific pricing structure discussed, there is mention of an integrated, seamless and simplified ticket structure. Providing an integrated, seamless and simplified ticketing system, including improved ticketing and improved information, should enable people to have more choices and better-informed travel choices, therefore making it easier for people to choose the best and cheapest option for them. This improved ticketing may reduce the need for people to buy multiple tickets. Improving the affordability of services could be particularly beneficial to lower income groups, as it may allow a wider range of services to be available to them This could include health services and leisure facilities, and provide health benefits through generally increasing access of opportunity.

Medium Term: The component is planned for delivery within the short term. However, continued benefits will be seen in the medium term. Affordable transport would increase the opportunity and accessibility to a wide range of health and wellbeing services, education and employment, the latter being particularly beneficial to improve the health and wellbeing of low income groups.

Long Term: The component is planned for delivery within the short term, however continued benefits will be seen in the long term – particularly for those on low incomes, and those who do not have access to a car.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: The STP should seek to ensure that new transport initiatives are priced in line with existing transport options, and promote accessibility for all – including those from low incomes – to encourage mode shift away from private vehicles. This will ensure that the services will provide individuals with affordable access to healthcare / wellbeing facilities, education and employment.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst safety this sub-objective is not a main aim of the strategic component, introducing smart ticketing and payment will reduce the time taken at stations/stops purchasing tickets, and real time information on services may reduce times at stops/interchanges. This in turn is likely to provide some safety benefits, particularly in areas of high crime.

Medium Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the medium term through reduced wait times at interchanges/stops/stations.

Long Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the long term through reduced wait times at interchanges/stops/stations.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: In order to reduce crime and fear of crime, it is important to ensure that public transport services / stations / environments are well lit, have good visibility and other appropriate safety measures to enhance the feeling of safety and security.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: An integrated, smart and simplified ticketing system increases the attractiveness of public transport and therefore may encourage car drivers to switch to public transport. This could reduce the number of cars in local areas, or on certain road corridors, reducing the number of accidents.

Medium Term: As infrastructure and smart ticketing is embedded in the medium term, there could be a continued mode shift to public transport and therefore, a potential reduction in accidents.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: A comprehensive communication and engagement strategy will help promote public transport changes and new services, which in turn will encourage mode shift away from cars, reducing the accidents rate per vehicle kilometre.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: An integrated, smart and simplified ticketing system should increase the attractiveness of public transport and therefore, encourage car drivers to switch to public transport. This could reduce the number of cars in local areas, or on certain road corridors, and therefore potentially improve actual or perceived severance for some groups. This in turn may provide more opportunities to access health and wellbeing services as well as employment, education and other vital services.

Medium Term: As infrastructure and smart ticketing is embedded further from the short term, there could be a continued mode shift to public transport and therefore, a reduction in congestion resulting in potentially improvements to feelings of severance associated with road traffic.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important to appraise specific schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	LT	Perm	Med	+	+	+	+

Commentary

Short Term: This component has the potential to create a mode shift from road to public transport. This could therefore reduce air and noise pollution in certain areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. It would also be beneficial to children and those with limiting health problems.

Medium Term: As integrated travel measures are further embedded in travel behaviour, a continual mode shift away from private vehicles may continue to provide environmental impacts in the medium term, and hence make improvements to the overall environment and subsequently health.

Long Term: Benefits are likely to continue in the long term as the system is further embedded in travel behaviour and there is a continued mode shift to public transport. The reduction of harmful air and noise pollutants from private vehicles, especially in deprived areas, will need time to disperse over many areas of the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity, it is important to consider both urban and income deprived areas in particular. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are more likely to suffer the health impacts of it. Therefore, any improvements would benefit them in particular. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children (such as schools, nurseries or playgrounds). Furthermore, people with long term health conditions, such as asthma will be particularly vulnerable to areas that have high quantities of air pollution.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: An integrated, smart and simplified ticketing system will increase the attractiveness of public transport and therefore potentially encourage car drivers to switch to public transport. This could reduce the number of cars in local areas, or on certain road corridors, reducing the number of accidents. This is particularly beneficial for vulnerable road users, such as pedestrians and cyclists.

Medium Term: As infrastructure and smart ticketing is embedded further in the medium term, there could be a continued mode shift to public transport and therefore, a reduction in accidents.

Long Term: The benefits are likely to continue into the long term if there is a continued reduction in car kilometres through a mode shift to alternative travel modes.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst this sub-objective is not a main aim of the strategic component, introducing smart ticketing and payment, will reduce the time taken at stations/stops purchasing tickets, and real time information on services may reduce times at stops/interchanges. This in turn is likely to provide some safety benefits, particularly in areas of high crime. This could be particularly beneficial for those who are most susceptible to perceived fear of crime and hate crimes, which includes, BAME populations, LGBT groups, women and those with disabilities.

Medium Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the medium term through reduced wait times at interchanges/stops/stations.

Long Term: Continuing from its introduction in the short term, some safety benefits are likely to continue into the medium term through reduced wait times at interchanges/stops/stations.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

G.7. Assessment of Strategic Component – Northern Powerhouse Rail

Table G-13 Strategic Component: Northern Powerhouse Rail – Description and Key Assumptions

Strategy Component: Northern Powerhouse Rail (NPR)
Significantly improving capacity, frequency and services between the North's main economic centres Northern Powerhouse Rail aims to support economic transformation in the North by delivering faster and more frequent rail journeys linking the North's six main cities with each other and Manchester Airport. It also has potential to provide much improved connectivity for other significant economic centres, and the potential to release capacity on the existing rail network for freight and other pan-Northern and local services. This was a vision that was set out in the Northern Transport Strategy with journey time and frequency aspirations. Working collaboratively with Partners, TfN and the Department for Transport have been developing what the Northern Powerhouse Rail network could look like. Analysis shows that Northern Powerhouse Rail would: • Change the way labour markets work, where people live and work and how businesses collaborate and will enable the North to attract and retain the people and skills it needs. Once the network is delivered, 40% of businesses identified as in the Northern Powerhouse Independent Economic Review prime capabilities (advanced manufacturing, digital, energy, and health innovation) would be within 90 minutes rail travel of four or more of the North's largest cities, compared to only 12% today. • Increase the population within 1 hour of 4 of the largest cities from 10,000 today to 1.3 million. • Be integrated with HS2 to maximise connectivity and demand on the planned new fast north south connections, and improving the business case for HS2 through greater use of infrastructure. Northern Powerhouse Rail and HS2 will together deliver the North's vision of city to city links, both east-west and north-south. Northern Powerhouse Rail will also be integrated with other rail services. Northern Powerhouse Rail stations will be planned as integrated hubs with HS2 and other rail services and be fitting gateways for the cities and towns that they serve, with integrated masterplans to support complementary development around the station. • Improve access to Manchester Airport from across the North to enable it to act as a global gateway for whole of the North of England. Journey times will be significantly reduced and services will be more frequent than now. As part of the collaboration TfN has carried out significant work to develop the Northern Powerhouse Rail network. This includes engineering feasibility work to identify feasible engineering options that will either deliver, or move substantially towards meeting the Northern Powerhouse Rail targets. TfN will continue to drive the case for investment in the North's rail network to deliver a transformed network, that meets the needs of residents, visitors and businesses and enables transformational economic growth, as much of the committed investment is required for Northern Powerhouse Rail to build upon. The next stage of development of the Northern Powerhouse Rail programme aims to identify preferred options for different components of the network, including: • Commencing preparation of a Business Case setting out the scheme development across the Northern Powerhouse Rail network; • Determining the train services that will operate on Northern Powerhouse Rail and how they interface with other rail services; • Exploring prioritised options to the next level of detailed feasibility, in order to select optimum solutions for each corridor, based on outputs, benefits and costs and also to develop Northern Powerhouse Rail at a network solution level, ready for detailed design at the next stage; • Ensuring that parts of the Northern Powerhouse Rail network which will utilise or interact with HS2 infrastructure are sufficiently understood, with proposals outlined and agreed with the Department for Transport for inclusion in the HS2 Phase 2B Hybrid Bill, due for submission in draft later this year; and • Working with Partners to develop plans for Northern Powerhouse Rail stations including supporting development of wider masterplans to develop integrated gateways.
Key Assumptions *The range of interventions possible under this strategic component are:* ***Railways*** • *New rail links* • *Rail infrastructure improvements* • *Station upgrades*

Table G-14 Assessment of Strategic Components: Northern Powerhouse Rail

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg-Nat	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services etc. It would also increase from 10,000 today to 1.3million the number of people who would be within one hour of four of the largest cities. These elements will all combine to make rail a much more attractive mode of travel and could significantly reduce road travel (for people and freight). Although GHG emissions from rail travel may rise, there would likely be a significant reduction in road transport GHG emissions associated with modal shift.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by the opening of major infrastructure projects such as HS2.

Long Term: It is anticipated that rail journeys would increase significantly due to this Strategic Component, with continued moderate beneficial effects. Integration with HS2 would enhance effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: No note is made of the need to protect and enhance biodiversity, geodiversity and green infrastructure, though there is the potential for effects (positive or negative) on these features from the expanded rail network depending upon the nature and location of interventions. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2, and cross reference to ‘Ensuring a Sustainable Investment Programme’ which addresses issues relating to biodiversity.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: No note is made of the need to conserve and enhance the international sites, though there is the potential for effects (positive or negative) on these from on the expanded rail network depending upon the nature and location of interventions. Effects from the implementation of NPR are anticipated as uncertain.

Medium Term: Effects, positive or negative, would be dependent upon the nature and location of interventions.

Long Term: Effects, positive or negative, would be dependent upon the nature and location of interventions.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **uncertain** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to biodiversity and the need to protect sites designated for nature conservation purposes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services, etc. It would also increase from 10,000 today to 1.3 million the number of people who would be within one hour of four of the largest cities. These elements will all combine to make rail a much more attractive mode of travel and could significantly reduce road travel (for people and freight), thereby likely reducing overall air pollutant emissions (relative to total travel kilometres), although total emissions from rail may rise.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by the opening of major infrastructure projects such as HS2.

Long Term: It is anticipated that rail journeys, and associated modal shift from road, would increase significantly due to this Strategic Component, with continued moderate beneficial effects. Integration with HS2 should enhance effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local	ST-LT	Perm	High	-	--	--	--

Commentary

Short Term: Rail infrastructure may be more vulnerable, compared to road infrastructure, to disruptive effects of extreme weather due to the variety of key assets which may be affected (track, bridges, signalling, switches, trackside equipment, overhead lines etc.). Effects are anticipated to be slight adverse.

Medium Term: Resilience of the transport network to extreme weather events and a changing climate is forecast to decline in the medium term, with the rail network expected to be relatively more vulnerable. As a result, effects are anticipated as moderate adverse.

Long Term: Resilience of the transport network to extreme weather events and a changing climate is forecast to decline over the long term. As a result, effects are anticipated as slight adverse.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be moderate adverse effects.

Mitigation

Mitigation Measures: See Mitigation Table 5, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to a changing climate and extreme weather events.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: New rail links may lead to additional polluted runoff, though areas of impermeable surfacing are likely to be small relative to roads. There is also the potential for pollution events during construction. There may be opportunities for the installation of SuDS, e.g. at new / upgraded stations. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 6, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to the water environment.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Development of new rail infrastructure in built up areas may provide opportunities to remediate contaminated sites (including removal of invasive species); however, this will depend on the location of developments. New rail links between cities will almost certainly result in the loss of agricultural land; however, the significance of the effect will depend on the quantity and quality of the soil affected. To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to soil and contamination.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Rail interventions anticipated under this Strategic Component could lead to a mix of beneficial or adverse effects on the setting of historic assets. For example, interventions could be developed adjacent to a historic site or these could relieve congestion in historic town centres. Development of interventions in greenfield areas is more likely to encounter archaeological features that have not previously been disturbed by urban development and would have an adverse effect. In contrast, upgrades to existing infrastructure could provide an opportunity to refurbish or enhance features of industrial heritage, e.g. bridges, railway stations, etc. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: It is anticipated that continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas, etc., but also through opportunities to enhance existing historic features. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: Continued development of interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas, etc., but also through opportunities to enhance existing historic features. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 8, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to historic and cultural heritage assets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Rail interventions could have potential adverse effects, particularly if located in or near areas of higher landscape or townscape character. Effects would be most pronounced for new rail routes which would most likely result in encroachment to greenfield areas, with semi-natural screening through vegetation requiring some time to be effective. Effects may be reduced in existing urban areas, but here infrastructure can still encroach on areas of open space or recreation. In contrast, in some areas interventions may provide opportunities for enhancement, e.g. new or upgraded stations as part of well planned urban regeneration, or by reducing congestion in urban areas. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: Screening would not be fully mature and any new rail intervention would still represent a new feature in the landscape / townscape. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: Screening would have had time to mature for the majority of rail interventions, reducing adverse effects. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to landscapes and townscapes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Greater efficiency across the rail network would help ensure a more prudent use of natural resources, e.g. through a reduction in hydrocarbon use. Better use of the existing rail network would also reduce the need for new infrastructure and would therefore help to reduce waste and resource use. Many of the interventions under this Strategic Component comprise the provision of new rail infrastructure or improvements and expansions to existing infrastructure. This would likely require additional resources and could increase waste production. However, to the extent NPR would result in mode shift from road to rail, road construction, which is relatively more resource intensive per travel kilometre, would be avoided. It is anticipated that effects would be slight beneficial.

Medium Term: Interventions would bring about better use of the rail network, with associated modal shift from road to rail. Slight beneficial effects are anticipated.

Long Term: Interventions would bring about better use of the rail network, with associated modal shift from road to rail. Slight beneficial effects are anticipated.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓	Reg-Nat	LT	Perm	Med	+	+	+	+

Commentary

Short Term: A key element of NPR is to make rail a more viable option to a greater number of people: from 10,000 within one hour of the four major cities to 1.3 million. NPR will also result in better capacity on the network for local services. These measures would provide a lower carbon choice for more people. In terms of rail user affordability, it is a noted aspiration that the network would meet the needs of residents, visitors and businesses; affordability may be considered within this. It is anticipated that the increase in numbers able to access a low carbon transport choice would result in moderate beneficial effects. However, the lack of clarity on affordability means that overall slight beneficial effects are anticipated.

Medium Term: Rail travel should continue to become more viable for a greater number of people, and local services capacity should improve, thereby enhancing lower carbon transport choice.

Long Term: Rail travel should continue to become more viable for a greater number of people, and local services capacity should improve, thereby enhancing lower carbon transport choice.

Overall, it is anticipated that in relation to this ISA Objective there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: It is a clear intention that NPR will support economic transformation by delivering faster and more frequent rail journeys linking the North's six main cities with each other and Manchester Airport. It would also release capacity on the network for more freight movements and result in 40% of the businesses identified as prime capabilities being within 90 minutes rail travel of four or more of the North's largest cities.

Medium Term: Faster and more frequent rail journeys linking the North's six main cities with each other and Manchester Airport will continue to play a vital role in the economic transformation of the area.

Long Term: Faster and more frequent rail journeys linking the North's six main cities with each other and Manchester Airport will continue to play a vital role in the economic transformation of the area.

Overall, it is anticipated that in relation to this ISA Objective there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: NPR will work collaboratively with a range of Partners to deliver a transformed network. This will include collaboration regarding stations becoming integrated hubs and will require master planning to support complementary developments. This will require a large degree of coordination between land use and strategic transport planning. Slight beneficial effects are anticipated.

Medium Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely becoming stronger as they develop along with the knowledge that underpins them. Moderate beneficial effects are anticipated.

Long Term: It is anticipated that the coordination developed through implementation of this Strategic Component would continue, with linkages likely becoming stronger as they develop along with the knowledge that underpins them. Moderate beneficial effects are anticipated.

Overall, it is anticipated that this Strategic Component would result in **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓✓	Local	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: NPR will act to increase access to a faster, more effective and enhanced rail service to a greater number of people. This would include providing more capacity for other Pan-Northern and local services. However, there is a clear focus on the major cities and full benefits may not be experienced across the network as a whole. Moderate beneficial effects are anticipated.

Medium Term: Continued implementation of this Strategic Component would continue to offer greater service to more people, but full benefits would still not be experienced across the network as a whole. Moderate beneficial effects are anticipated.

Long Term: Continued implementation of this Strategic Component would continue to offer greater service to more people, but full benefits would still not be experienced across the network as a whole. Moderate beneficial effects are anticipated.

Overall, it is anticipated that in relation to this ISA Objective there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: Significant reductions in journey times and enhanced services may help to act to reduce traveller stress which would act to improve well-being. It is noted that improvements are aimed at residents, visitors and businesses. Slight beneficial effects are anticipated

Medium Term: Continued implementation of this Strategic Component would act to reduce traveller stress and thereby potentially improve well-being. Moderate beneficial effects are anticipated.

Long Term: Continued implementation of this Strategic Component would act to reduce traveller stress and thereby potentially improve well-being. Moderate beneficial effects are anticipated.

Overall, it is anticipated that in relation to this ISA Objective there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: NPR would result in better and more integrated stations and would be complementary with surrounding developments. It is anticipated that these would result in a modern and safe travelling environment that would help reduce crime and the fear of crime. Slight beneficial effects are anticipated.

Medium Term: Continued implementation of this Strategic Component would help ensure the ongoing reduction in crime and fear of crime, with slight beneficial effects anticipated.

Long Term: Continued implementation of this Strategic Component would help ensure the ongoing reduction in crime and fear of crime, with slight beneficial effects anticipated.

Overall, it is anticipated that in relation to this ISA Objective there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: The NPR states the increase the population within 1 hour of 4 of the largest cities from 10,000 today to 1.3million. This enables a wider range of people to access services and jobs. This could also improve access to those services, such as health care for people without a car This may include high proportions of elderly people and people with a disability.

Medium Term: The benefits could be increased over the medium term and grow as more people are able to access some off the large cities, therefore, increasing the number of jobs people have access to as well as the services. It will be important that when increasing the population that can access the four major cities within an hour that all communities and groups are being considered. It is important for people with disabilities and of all faiths to have access to a range of community centres, faith centres and social clubs in major cities as well as it is important for lower income people to have access to a range of jobs.

Long Term: Benefits could be maximised over the long term as the infrastructure is developed to make sure a range of communities and areas can reach the jobs and services the cities have to offer within an hour.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There is no specific information or mention on ticketing and the fare structure. Improving ease of access and speed to multiple destinations may enable cheaper travel to and from these destinations.

Medium Term: If travel to multiple destinations becomes easier and more affordable it is likely to allow more people to access a number of services and jobs. This is especially important for those in low income groups, which could include elderly people and children.

Long Term: If a number of communities have affordable access to a number of services and jobs this will benefit a wide range of people in the long term. Especially those lower income groups who may have limited access to a range of faith and community centres.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Any pricing schedules developed for new transport initiatives should be in line with existing pricing schedules in order to maximise accessibility for individuals (for access to employment and other services).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There are no specific measures mentioned that are aimed at reducing crime and promoting community safety. However, it is expected any new infrastructure will have the appropriate safety measures in place and will be in line with current standards. This will be particularly important for those groups who are known to experience disproportionate impacts of crime / fear of crime, including children, the elderly, females and BAME groups[39].

Medium Term: There are unlikely to be any changes in perception of security and community safety as a result of this strategic component.

Long Term: There are unlikely to be any changes in perception of security and community safety as a result of this strategic component.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: Increasing the attractiveness of the rail as an option may create a mode shift from cars to rail. This could reduce the number of cars on the road and therefore reduce the likeliness of a collision. This could consequently improve road safety, which is especially important for vulnerable users such as pedestrians and cyclists, which may be a high proportion of people who do not have access to a car such as children and elderly people.

Medium Term: Increasing the attractiveness of rail, through different measures, may encourage more car drivers to travel by rail. This could create a mode shift from car to train which will gradually increase as the infrastructure develops. Therefore, there is likely to be a greater safety benefit over the medium term. Reducing the number of cars, especially in dense urban areas, where there might be a large number of pedestrians and cyclists. This could be in areas with a high proportion of people who do not own a car, or areas with high numbers of children or elderly people.

Long Term: As with the medium term, as the infrastructure develops and makes rail a more attractive mode of travel, it is likely to reduce the number of cars over the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	LT	Perm	Med	+	++	++	++

[39] http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/inclusion/mef/publictransportneedsofminori3259

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services etc. It will also increase from 10,000 today to 1.3million the number of people who would be within 1 hour of 4 of the largest cities. These elements will all combine to make rail a much more attractive mode of travel and could therefore create a mode shift from car to rail. There could also be a similar shift from HGV to freight rail if that became a more attractive way of moving goods. Reducing the number of HGVs and cars on the road has the potential to have a perceived reduction in severance. Any new interchanges could attract a high level of cars in the local area surrounding the station and therefore, may increase severance.

Medium Term: Mode shifts from car to rail are likely to be medium to long term as the infrastructure is implemented over time. Therefore, benefits from a mode shift and consequently a reduction in severance are more likely to be felt over the medium to long term. Reduction in perceived severance is more likely to be noticed in areas where there are a high number of pedestrians and schools as they may contain a high proportion of children.

Long Term: As with the medium term, benefits of a perceived reduction in severance take a while reach their full affect. Therefore, benefits will be felt in the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When designing interchanges, it is important to make sure there is good access for those not using a car. Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance – particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓	Local-Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services etc. It will also increase from 10,000 today to 1.3million the number of people who would be within 1 hour of 4 of the largest cities. These elements will all combine to make rail a much more attractive mode of travel and could therefore create a mode shift from car to rail. There could also be a similar shift from HGV to freight rail.

Reducing the number of cars and HGVs on the road could consequently reduce noise and air pollution on some road corridors. This is especially important in dense urban areas with facilities that may contain a high proportion of children. Any additional interchanges could increase traffic in close vicinity to it, therefore, this could have an impact on air and noise pollution in the local area.

Medium Term: A reduction in the volume of road traffic because of the attractiveness of rail as a mode of transport will have increased benefits over the medium term. Therefore, benefits in vibration and air, noise and light pollution are likely to be increased in medium term

Long Term: The benefits in air, noise and light pollution are likely to be maximised over the medium to long term after the new infrastructure has been developed and utilised to the full affect.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. schools. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

It is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local -Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: The NPR states it will increase the population within 1 hour by rail of 4 of the largest cities from 10,000 today to 1.3million. This enables a wider range of people to access services and jobs in the cities. This could also improve access to other services, such as health care and leisure and recreation facilities – particularly for people without a car. This may particularly benefit elderly people, people with a disability or those with limiting illnesses who are most likely to require frequent access to healthcare facilities. As this component aims to increase accessibility to/from the 4 largest cities, it may also improve accessibility to areas where there are high levels of employment for deprived communities. The impact in the short term is however considered to be slight due to the time taken to implement such improvements.

Medium Term: The impacts of the component are likely to increase over the medium term and grow as more people are able to access the large cities by public transport, and the associated facilities these provide (employment, healthcare leisure facilities). The placement

Long Term: Benefits could be maximised over the long term as the infrastructure is developed to make sure a range of communities and areas can reach the jobs and services the cities have to offer within an hour.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues). It is also important for people with disabilities and limiting health conditions that they have easy access to health care in the major cities, as well as for lower income people to have access to a range of jobs.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There is no specific information or mention of ticketing and the fare structure. Improving accessibility by rail may provide more feasible affordable transport options for communities to access vital services for health (healthcare, leisure and recreation facilities) provided they are an affordable transport option (i.e. at most in line with current transport options).

Medium Term: If travel to multiple destinations becomes easier and more affordable it is likely to allow more people to access a number of services and jobs. This is especially important for those in low income groups, which could include elderly people and those with disabilities and limiting conditions.

Long Term: If a number of communities have affordable access to a number of services and jobs this will benefit a wide range of people in the long term. Especially those lower income groups who may need access to healthcare more frequently.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: The STP should seek to ensure that new transport initiatives to improve rail connectivity are priced in line with existing transport options. This will ensure that the services not only provide benefits to businesses, but also to individuals who can use the initiatives to access employment, and also a range of facilities that will impact on health and wellbeing (i.e. health care services, open spaces, leisure and recreational facilities).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There are no specific measures mentioned that are aimed at reducing crime and promoting community safety. However, it is expected any new infrastructure will have the appropriate safety measures in place and will be in line with current standards.

Medium Term: There are unlikely to be any changes in perception of security and community safety as a result of this strategic component.

Long Term: There are unlikely to be any changes in perception of security and community safety as a result of this strategic component.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with communities such as hospital groups, the elderly, or disability groups would assist in identifying any existing safety and security concerns on current transport services/routes – this would then allow inclusion of suitable safety measures within new transport interventions, maximising benefits to individuals (for employment or other health and wellbeing access) as well as business connectivity.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	LT	Perm	Med	+	++	++	++

Commentary

Short Term: Increasing the attractiveness of the rail as an option may create a mode shift from cars to rail. This could reduce the number of cars on the road and therefore reduce the likeliness of a collision. This could consequently improve road safety, which is especially important for vulnerable users such as pedestrians and cyclists. However, it is important to consider that increased traffic around new/improved interchanges may increase accidents.

Medium Term: Increasing the attractiveness of rail, through different measures, may encourage more car drivers to travel by rail. This could create a mode shift from car to train which will gradually increase as the infrastructure develops. Therefore, there is likely to be a greater safety benefit over the medium term. Reducing the number of cars, especially in dense urban areas, where there might be a large number of pedestrians and cyclists. This could be in areas with a high proportion of people who do not own a car, or areas with high amounts of children or elderly people.

Long Term: As with the medium term, as the infrastructure develops and makes rail a more attractive mode of travel, it is likely to reduce the number of cars over the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When designing interchanges, it is important to make sure there is good access for those not using a car.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	LT	Perm	Low	+	++	++	++

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services etc. It will also increase the number of people who would be within 1 hour of 4 of the largest cities from 10,000 today to 1.3million. These elements will all combine to make rail a much more attractive mode of travel and could therefore create a mode shift from car to rail. There could also be a similar shift from HGV to freight rail if that became a more attractive way of moving goods. Reducing the number of HGVs and cars on the road has the potential to have a perceived reduction in severance. Any new interchanges could attract a high level of cars in the local area surrounding the station and therefore, may increase severance.

Medium Term: Mode shifts from car to rail are likely to be medium to long term as the infrastructure is implemented over time. Therefore, benefits from a mode shift and consequently a reduction in severance are more likely to be felt over the medium to long term. Reduction in perceived severance is more likely to be noticed in areas where there are a high number of pedestrians and schools as they may contain a high proportion of children.

Long Term: As with the medium term, benefits of a perceived reduction in severance take a while reach their full affect. Therefore, benefits will be felt in the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: If adding any new rail corridors, that could potentially cause an increase in perceived severance, it is important to consider any local mitigations or barriers to avoid or reduce severance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Ref	LT	Perm	Med	+	++	++	++

Commentary

Short Term: It is the intention that NPR will deliver faster and more frequent rail journeys, release capacity on the existing network for freight and other Pan-Northern local services etc. It will also increase the number of people who would be within 1 hour of 4 of the largest cities from 10,000 today to 1.3million. These elements will all combine to make rail a much more attractive mode of travel and could therefore create a mode shift from car to rail. There could also be a similar shift from HGV to freight rail.

Reducing the number of cars and HGVs on the road could consequently reduce noise and air pollution on some road corridors. This is especially important in dense urban areas with facilities that may contain a high proportion of children, or health problems. People in deprived communities also tend to experience poorer air quality as a result of transport related air pollution, so any improvements that benefit them particularly would be particularly beneficial.

Medium Term: A reduction in the volume of road traffic because of the attractiveness of rail as a mode of transport will have increased benefits over the medium term. Therefore, benefits in vibration and air, noise and light pollution are likely to be increased in medium term

Long Term: The benefits in air, noise and light pollution are likely to be maximised over the medium to long term after the new infrastructure has been developed and utilised to the full affect. Any new rail lines should have mitigations for the local area, such as noise barriers.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore, people which long term conditions, such as Asthma will be particularly vulnerable to areas increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of the rail as a travel option may create a mode shift from cars to rail. This could reduce the number of cars on the road and therefore reduce the likeliness of collisions. This could consequently improve road safety, which is especially important for vulnerable users such as pedestrians and cyclists, which may be a high proportion of people who do not have access to a car such as children and elderly people.

Medium Term: Increasing the attractiveness of rail, through different measures, may encourage more car drivers to travel by rail. This could create a mode shift from car to train which will gradually increase as the infrastructure develops. Therefore, there is likely to be a greater safety benefit over the medium term. Reducing the number of cars, especially in dense urban areas, where there might be a large number of pedestrians and cyclists. This could be in areas with a high proportion of people who do not own a car, or areas with high numbers of children or elderly people.

Long Term: As with the medium term, as the infrastructure develops and makes rail a more attractive mode of travel, it is likely to reduce the number of cars over the longer term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Rail design (stations, routes, timings etc.) sure ensure complete inclusivity to maximise the potential mode shift. This in turn will maximise the impacts on safety on both rail and road.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There are no specific measures mentioned that are aimed at reducing crime and promoting community safety. However, it is expected any new infrastructure will have the appropriate safety measures in place and will be in line with current standards.

Medium Term: As with short term, it is assumed that the component will ensure the appropriate safety measures to maximise the impact on actual and perceived safety issues.

Long Term: As with short term, it is assumed that the component will ensure the appropriate safety measures to maximise the impact on actual and perceived safety issues.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services/measures.

G.8. Assessment of Strategic Component – Rail North Long Term Rail Strategy

Table G-15 Strategic Component: Rail North Long Term Rail Strategy – Description and Key Assumptions

Strategy Component: Rail North Long Term Rail Strategy
Investment sponsored by local transport authorities and others has supported a rail renaissance in many areas with annual growth rates outstripping growth in London and the South East. Despite this growth, rail in the North is under-performing compared with networks elsewhere and therefore not realising its full potential. Subsidy requirements have been higher in the North than other parts of the country (although this is due to reduce significantly in the new Northern and Trans Pennine franchises and become a net financial return). In part, this has been a legacy of under investment, for example in route upgrades and modern rolling stock. Rail in the North can and should deliver greater benefits and efficiencies. Committed investment in the Great North Rail project (including the Northern Hub and electrification) is a welcome start in reversing the legacy, but TfN and Rail North will be making the case for an ongoing programme of investment. Rail connectivity is key to accommodating large volumes of commuters across the North. Improving rail connectivity would boost inter-city connectivity, such as through Northern Powerhouse Rail, which can enable businesses in Northern economic centres to develop stronger economic links with other major global economic regions. This will grow labour markets and create more links between businesses. Rail connectivity for freight is also crucial, with the need to release capacity for more freight services and allow a greater use of the North's ports and airports to deliver UK net benefits. Evidence produced by TfN has demonstrated that East- West connectivity is critical to delivering growth in the North. Rail North, through a Long Term Rail Strategy, has been working with Partners to deliver improved services with the following themes: • Connectivity - Better connectivity, with targeted improvements to journey times, service frequencies and improved connections to make end-to end journey times quicker. • Coherence - A more coherent and user-friendly network: a network with the visible coherence of the London Underground delivered over the North's wide geography. This needs defined categories of train services as well as planning the North's many routes to operate together as a single whole with a single simplified fares structure. • Capacity - Increased capacity, both on train so that passengers do not experience excessive overcrowding and on track so additional demand for economically worthwhile passenger and freight movements can be accommodated. • Cost effective - As use of the North's rail service grows, running costs per passenger and tonne of freight carried need to fall. The key to achieving this is investment. Rail North's existing Long Term Rail Strategy highlights that investment in the rail network could contribute towards £50 billion increase in GVA over a 60 year period, equating to £0.9bn per year. Making the railway network more efficient, backed by the statutory role of TfN, will ensure that rail and other services, through smart ticketing, providing longer and/or more frequent trains, a train procurement strategy and changes to operating practices will provide a service that caters for the needs of the North. Rail North through its Long Term Rail Strategy will identify the conditional outputs, that TfN through its programme of Strategic Development Corridors will determine the interventions needed to deliver sustainable economic growth to the North, as well as improvements required across the rest of the rail network in order to drive the long term Investment Programme. Rail can move large numbers of people and goods and can bring benefits through improved connectivity across the North, and better access to services and facilities will encourage more people to use the rail network for commuting, business and tourism. Ensuring that the right infrastructure is in place is key to achieving this growth. The Long Term Rail Strategy is currently being updated and will be key evidence to inform the Strategic Transport Plan and long term Investment Programme. As set out in the existing Rail North's Long Term Rail Strategy, the delivery of an improved, integrated rail network can be achieved through eight key principles. 1. Harmonised and simplified fares system (including smarter ticketing technology). 2. The adoption of a categorised service specification (e.g. high speed, inter-regional express, urban commuter, community railways etc.) each with specific service and rolling stock standards. 3. Timetables designed to provide good connections between connecting rail services. 4. Information provided in a user-friendly manner before and throughout the journey across the network including on connecting modes using the latest ever-evolving systems and databases. 5. Stations designed and operated to facilitate transfers for all users between rail services and onward connections by bus, tram, cycle, car and walking routes. 6. Operational practices designed to facilitate through journeys including those involving interchange and including between different operators.

Strategy Component: Rail North Long Term Rail Strategy
6. Investment in infrastructure and rolling stock designed to create a pleasant and safe travelling environment that is accessible for all to avoid overcrowding and to improve timetables. A progressive introduction of these principles achieved through franchise specifications and input to on-going railway planning processes and through supporting activities of local planning authorities.
Key Assumptions *The range of interventions possible under this strategic component are:* ***Railways*** • *New rail links* • *Rail infrastructure improvements* • *Station upgrades*

Table G-16 Assessment of Strategic Components: Rail North Long Term Strategy

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓	Reg-Nat	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: The goal of the LTS is encapsulated in the themes of connectivity, coherence, capacity and cost effectiveness. These themes should make rail travel more efficient, user friendly and cost effective, would encourage greater rail movement and reduce the need to travel by road, thereby likely reducing overall GHG emissions (relative to total travel kilometres), although total emissions from rail may rise. This effect would be enhanced by the further implementation of electrification of the network.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by committed investment such as that in the Great North Rail project.

Long Term: It is anticipated that rail journeys overall, and the proportion of journeys by rail, would have increased significantly due to this Strategic Component and ongoing investment, with continued moderate beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: No note is made of the need to protect and enhance biodiversity, geodiversity and green infrastructure, though there is the potential for effects (positive or negative) on these features from the expanded rail network depending upon the nature and location of interventions. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, effects would be **slight beneficial**.

Mitigation

Mitigation Measures: See Mitigation Table 2, and cross reference to ‘Ensuring a Sustainable Investment Programme’ which addresses issues relating to biodiversity.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: No note is made of the need to conserve and enhance international sites, though there is the potential for effects (positive or negative) on these from the expanded rail network depending upon the nature and location of interventions. Effects from the implementation of NR LTS are anticipated as uncertain.

Medium Term: Effects, positive or negative, would be dependent upon the nature and location of interventions.

Long Term: Effects, positive or negative, would be dependent upon the nature and location of interventions.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **uncertain** effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 2 and 3, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to biodiversity and the need to protect sites designated for nature conservation purposes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local-Reg	ST-LT	Perm	Med	++	++	++	++

Commentary

Short Term: The goal of the LTS is encapsulated in the themes of connectivity, coherence, capacity and cost effectiveness. These themes should make rail travel more efficient, user friendly and cost effective, would encourage greater rail movement and reduce the need to travel by road, thereby likely reducing overall air pollutant emissions (relative to total travel kilometres), although total emissions from rail may rise. This effect would be enhanced by the further implementation of electrification of the network.

Medium Term: It is anticipated that a shift in travel mode would continue due to this Strategic Component, with continued moderate beneficial effects. This would be enhanced by committed investment such as that in the Great North Rail project.

Long Term: It is anticipated that rail journeys, and associated modal shift from road, would increase significantly due to this Strategic Component and ongoing investment, with continued moderate beneficial effects.

Overall, it is anticipated that in relation to this ISA Objective, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local	ST-LT	Perm	High	-	--	--	--

Commentary

Short Term: Rail infrastructure may be more vulnerable, compared to road infrastructure, to disruptive effects of extreme weather due to the variety of key assets which may be affected (track, bridges, signalling, switches, trackside equipment, overhead lines, etc.). Effects are anticipated to be slight adverse.

Medium Term: Resilience of the transport network to extreme weather events and a changing climate is forecast to decline in the medium term, with the rail network expected to be relatively more vulnerable. As a result, effects are anticipated as moderate adverse.

Long Term: Resilience of the transport network to extreme weather events and a changing climate is forecast to decline over the long term, with the rail network expected to be relatively more vulnerable. As a result, effects are anticipated as moderate adverse.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **moderate adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 5, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to a changing climate and extreme weather events.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: New rail links may lead to additional polluted runoff, though areas of impermeable surfacing are likely to be small relative to roads. There is also the potential for pollution events during construction. There may be opportunities for the installation of SuDS, e.g. at new / upgraded stations. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 6, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to the water environment.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Development of new rail infrastructure in built up areas may provide opportunities to remediate contaminated sites (including removal of invasive species); however, this will depend on the location of developments. New rail links between cities will almost certainly result in the loss of agricultural land; however, the significance of the

effect will depend on the quantity and quality of the soil affected. To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: To the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 7, and cross reference to 'Ensuring a Sustainable Investment Programme' which will address issues relating to soil and contamination.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Rail interventions anticipated under this Strategic Component could lead to a mix of beneficial or adverse effects on the setting of historic assets. For example, interventions could be developed adjacent to a historic site or these could relieve congestion in historic town centres. Development of interventions in greenfield areas is more likely to encounter archaeological features that have not previously been disturbed by urban development and would have an adverse effect. In contrast, upgrades to existing infrastructure could provide an opportunity to refurbish or enhance features of industrial heritage, e.g. bridges, railway stations, etc. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: It is anticipated that continued development of rail interventions would result in a mix of slight beneficial and slight adverse effects due to the continued development in greenfield areas, etc., but also through opportunities to enhance existing historic features. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: Continued development of rail interventions would result in a mix of slight beneficial and slight adverse effects due to continued development in greenfield areas etc., but also through opportunities to enhance existing historic features. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 8, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to historic and cultural heritage assets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓	Local-Reg	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Rail interventions could have potential adverse effects, particularly if located in or near areas of higher landscape or townscape character. Effects would be most pronounced for new rail routes which would most likely result in encroachment to greenfield areas, with semi-natural screening through vegetation requiring some time to be effective. Effects may be reduced in existing urban areas, but here infrastructure can still encroach on areas of open space or recreation. In contrast, in some areas interventions may provide opportunities for enhancement, e.g. new or upgraded stations as part of well planned urban regeneration, or by reducing congestion in urban areas. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Medium Term: Screening would not be fully mature and any new rail intervention would still represent a new feature in the landscape / townscape. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Long Term: Screening would have had time to mature for the majority of rail interventions, reducing adverse effects. However, to the extent that road construction is avoided and road use reduced, due to modal shift, effects are anticipated as overall slight beneficial.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 9, and cross reference to 'Ensuring a Sustainable Investment Programme' which addresses issues relating to landscapes and townscapes.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local	ST-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Many of the interventions associated with Rail North's Long Term Rail Strategy are anticipated to be improvements to existing services and infrastructure, which would help ensure a more prudent use of natural resources. Better use of the existing rail network would also reduce the need for new infrastructure and would therefore help to reduce waste. No note is made of recycling. To the extent the LTS would result in mode shift from road to rail, road construction, which is relatively more resource intensive per travel kilometre, would be avoided. It is anticipated that effects would be slight beneficial.

Medium Term: Slight beneficial effects are anticipated to continue with the implementation of NR LTS.

Long Term: Slight beneficial effects are anticipated to continue with the implementation of NR LTS.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓✓	Reg-Nat	LT	Perm	Med	++	++	++	++

Commentary

Short Term: The goal of the LTS is encapsulated in the themes of connectivity, coherence, capacity and cost effectiveness. These themes should make rail travel more efficient, user friendly and cost effective, would encourage greater rail movement and reduce the need to travel by road, thereby likely reducing overall GHG emissions (relative to total travel kilometres), although total emissions from rail may rise. This effect would be enhanced by the further implementation of electrification of the network. The cost effectiveness element of the LTS is also key, with this likely to make it more affordable for operators and users. It is anticipated that effects would be moderate beneficial.

Medium Term: Rail should continue to be efficient, user friendly and cost effective, enhancing affordable low carbon transport choice. Effects are anticipated to be moderate beneficial.

Long Term: Rail should continue to be efficient, user friendly and cost effective, enhancing affordable low carbon transport choice. Effects are anticipated to be moderate beneficial.

Overall, it is anticipated that in relation to this ISA Objective there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: The LTS themes of connectivity, coherence, capacity and cost effectiveness should all help to ensure that rail plays a key role in economic growth, for example by reducing delays to the movement of goods, releasing capacity on the network for more freight services, and enhancing connectivity for commuter and business travel. It is recognised by this Strategic Component that this should grow labour markets and create more links between businesses. Investment in the rail network could contribute towards a £50 billion increase in GVA over 60 years. Large beneficial effects are anticipated.

Medium Term: Increased rail connectivity, coherence and capacity would continue to play a vital role in the economic transformation of the area, with large beneficial effects.

Long Term: Increased rail connectivity, coherence and capacity would continue to play a vital role in the economic transformation of the area, with large beneficial effects.

Overall, it is anticipated that in relation to this ISA Objective there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	+++	+++	+++	+++

Commentary

Short Term: It is one of the eight key principles of the LTS to input to the on-going railway planning process and support the activities of Local Planning Authorities. This is anticipated to have large beneficial effects.

Medium Term: It is anticipated that the ongoing implementation of this Strategic Component would result in further input to the railway planning process and provide support to the activities of Local Planning Authorities, with ongoing large beneficial effects.

Long Term: It is anticipated that the ongoing implementation of this Strategic Component would result in further input to the railway planning process and provide support to the activities of Local Planning Authorities, with ongoing large beneficial effects.

Overall, it is anticipated that, in relation to this ISA Objective, there would be **large beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓✓	Local	ST-LT	Perm	High	++	++	++	++

Commentary

Short Term: It is noted among the eight key principles of the LTS that there is a desire for rail to be accessible for all. This, along with better connections, improved affordability, easier use of the network, and better and easier to understand and access information, would all contribute towards opening up the rail network to a greater number of people, which should help to achieve a fairer society. Moderate beneficial effects are anticipated.

Medium Term: It is considered that ongoing implementation of this Strategic Component will result in further enhancement of connections, affordability, access and opening up of the rail network to a greater number of people, which should result in continuing beneficial effects.

Long Term: It is considered that ongoing implementation of this Strategic Component will result in further enhancement of connections, affordability, access and opening up of the rail network to a greater number of people, which should result in continuing beneficial effects.

Overall, it is anticipated that in relation to this ISA Objective, there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 14.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local	ST-LT	Perm	High	++	++	+++	++

Commentary

Short Term: Among the eight key principles of the LTS is that stations will be designed and operated to facilitate transfers for all users between rail services and onward connections by bus, tram, cycle, car and walking routes. This would encourage more travel by healthier, less stressful modes and therefore potentially improve health and well-being. There could also be a reduction in stress levels for people using the rail network through a reduction in overcrowding and an improvement in the ease of using the network through initiatives such as a harmonised and simplified fares system and better journey information delivery. Better connections, etc. could also make accessing services for leisure and health easier for more people. Moderate beneficial effects are anticipated.

Medium Term: Ongoing implementation of this Strategic Component would potentially further health and well-being through the mechanisms noted above, with continued moderate beneficial effects anticipated.

Long Term: Ongoing implementation of this Strategic Component would potentially further health and well-being through the mechanisms noted above, with large beneficial effects anticipated.

Overall, it is anticipated that in relation to this ISA Objective there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: It is one of the key eight principles of the LTS to create a pleasant and safe travelling environment that is accessible for all to avoid overcrowding. Effects are anticipated to be slight beneficial.

Medium Term: Ongoing implementation of this Strategic Component would continue to enhance the attractiveness and safety of the rail travelling environment, with moderate beneficial effects anticipated as interventions spread across the network.

Long Term: Ongoing implementation of this Strategic Component would continue to enhance the attractiveness and safety of the rail travelling environment, with moderate beneficial effects anticipated as interventions spread across the network.

Overall, it is anticipated that in relation to this ISA Objective there would be **moderate beneficial** effects.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Three of the eight key principles make improvements to accessing a number of services:

- Stations to be designed and operate to facilitate transfers for all users, between rail services and onward connections by bus, tram, cycle, car and walking routes.
- Operational practices designed to facilitate through journeys, including those involving interchanges and those between different operators.
- Investment in infrastructure and rolling stock designed to create a pleasant and safe travelling environment, which is accessible for all, will avoid overcrowding and will improve timetabling.

The above principles are designed to help improve access, this is particularly important for people who do not have access to a car. This will include a high proportion of children, older people and people with disabilities. These principles could also be beneficial for people accessing health services and leisure facilities, and could provide new or improved links to employment and education, which will be beneficial for unemployed people and young people.

Medium Term: Stations that are designed to improve accessibility as well as avoid overcrowding, are likely to make it easier for people to travel and in the medium term help those who had poor access to services and facilities. This is particularly important for people without access to a car.

Long Term: Similarly to medium term, stations that are designed to improve accessibility as well as avoid overcrowding, are likely to make it easier for people to access to services and facilities. This is particularly important for groups without a car, older people and disabled people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport options that incorporate new transport links, are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services, open spaces or schools.

It is also important to consider safety measures when designing new service links, such as ensuring that appropriate lighting and CCTV is being used where appropriate.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: One of the principle aims is to produce a harmonised and simplified fare system (including smarter ticketing technology). Affordability is dependent on the exact pricing structure, however, simplifying the ticket process may allow people to identify and choose the cheapest ticket option available to them. This structure may also reduce the need to buy multiple tickets, and this is likely to improve affordability. This would be beneficial for those in lower income groups.

Medium Term: The structure of a harmonised and simplified ticketing has the potential to improve affordability of rail for all, this could make rail travel a more viable option for all groups, especially low-income groups.

Long Term: This could potentially create a more inclusive rail network. Rail could become a viable and affordable option for all groups.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

Ensure information is disseminated effectively to the public, making a particular effort to ensure timetabling and ticket price information is available to lower income groups, older people and disabled people. Promotional materials need to use uncomplicated language and information, in order to ensure the information is understandable for all.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: The objective aims to improve station design and invest in infrastructure and rolling stock to create a pleasant and safe travelling environment, which is accessible for all, will avoid overcrowding and will improve timetabling. Therefore, this is likely to increase user perceptions of security and safety over the short term.

Medium Term: Improving the station design could allow people to feel safer and therefore, have a perceived increase in security and community safety.

Long Term: A perceived safer environment could attract more people to the stations, this may also have positive impacts in increasing perception of user security and safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When improving interchanges and cycling provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. Cycle infrastructure should be designed to enhance cyclist safety, and reduce potential conflicts with traffic and pedestrians. It should also be well maintained and well-lit and signed.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Whilst there is no specific mention of any safety measures or a reduction in cars on the road, there is mention of an improved, integrated rail network. The rail network should provide a viable alternative to car transport, which could create a mode shift from car to rail. Furthermore, the stations facilitating greater connections to bus, tram, cycle, car and walking routes could also make the journeys to/from the station shift from car to public transport/active travel. These mode shifts could ultimately reduce the number of accidents and other incidents by reducing the number of km travelled by cars.

Medium Term: The short-term benefits are likely to be increased over the medium term, due to the time taken improving and integrating the rail network and then facilitating the connections to onward travel. However, making these modes viable and attractive transport options could create a mode shift to public transport and hence reduce accidents. This will be particularly beneficial for vulnerable users including pedestrians and cyclists, which may include a high proportion of children and elderly people.

Long Term: It is likely benefits will be increased as the long-term strategy is developed further and the infrastructure is developed to further improve and integrate the rail network.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

Liaising with relevant stakeholders such as the police and road safety officers, would improve knowledge of the types of accidents and be able to provide advice on how to reduce them.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Any reduction in car trips by promoting a mode shift from car to public transport/active travel can have a positive impact on severance. Encouraging active travel at interchanges, by reducing the perception of severance, could help people increase their activity levels and consequently have positive impacts on their health. A reduction in severance is likely to be beneficial for children, older people, pregnant women or those with small children and those with disabilities.

Medium Term: Interchanges focussed on active travel have the potential to reduce the perception of severance. This is particularly beneficial for areas with a number of schools and households without a car. Furthermore, any reduction in car trips as a result of making rail or active travel a more attractive option, could reduce traffic in the area and therefore have a positive impact on perceived severance.

Long Term: As this is a long-term strategy, measures and infrastructure likely to facilitate mode shift and active travel could take time. Therefore, it is likely these benefits will be increased in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible – particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce air, noise and light pollution from transport	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Making travel by rail a more attractive and viable option, in addition to improving interchanges with other public transport modes and active travel, could encourage more people to travel by other means than by car. This is important for urban areas and areas with a high proportion of children, or services that are likely to attract a high proportion children (such as schools, nurseries and playgrounds), as they are more likely to be susceptible to the negative effects of noise pollution. Furthermore, mode shift from car to rail may reduce emissions being produced by cars, consequently improving air quality. This would be beneficial on public health, particularly for children, older people, people with disabilities and those with respiratory illnesses.

Medium Term: The infrastructure used to increase the attractiveness of rail and active travel may take some time to implement. Therefore, benefits in vibration, air, noise and light pollution could increase throughout the medium term.

Long Term: As this is a long-term strategy, measures and infrastructure likely to facilitate mode shift and active travel could take time. Also, the uptake in people choosing the modes may not be immediate. Therefore, it is likely these benefits to vibration and air, noise and light pollution will continue to increase in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations:

When enhancing connectivity, is important to consider urban areas and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are also more likely to suffer health problems, consequently, any improvements would benefit them. Furthermore, children are particularly vulnerable to noise pollution, therefore it is important to consider the number of children and facilities such as schools in development areas. Furthermore, people with long term health conditions, such as Asthma will be particularly vulnerable to areas experiencing increases in air pollution.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	+++

Commentary

Short Term: Three of the eight key principles make improvements to accessing a number of services:

- Stations to be designed and operate to facilitate transfers for all users, between rail services and onward connections by bus, tram, cycle, car and walking routes.
- Operational practices designed to facilitate through journeys, including those involving interchanges and those between different operators.
- Investment in infrastructure and rolling stock designed to create a pleasant and safe travelling environment, which is accessible for all, will avoid overcrowding and will improve timetabling.

The above principles are designed to help improve access, this is particularly important for people who do not have access to a car. This will include a high proportion of children, older people as well as people with disabilities. These principles could also be beneficial for people accessing health services and leisure facilities.

Medium Term: Stations that are designed to improve accessibility as well as avoid overcrowding, are likely to make it easier for people to travel and in the medium term help those who had poor access to services and facilities. Having better rail connectivity will encourage more people to travel by rail, which may reduce the number of cars being used. This in turn could have a beneficial impact on air quality, which would have health benefits, particularly for children, the elderly, and disabled people, especially those with respiratory illnesses.

Long Term: As with the medium-term benefits, stations that are designed to improve accessibility as well as avoid overcrowding, are likely to make it easier for people to travel and in the long term help those who had poor access to services and facilities. Having better rail connectivity will encourage more people to travel by rail, which may reduce the number of cars being used. This in turn could have a beneficial impact on air quality, which would have health benefits, particularly for children, the elderly, and disabled people, especially those with respiratory illnesses.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport options resulting in new links are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services and that they do not negatively impact on communities.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	+++

Commentary

Short Term: One part of this strategic component aims to produce a harmonised and simplified fare system (including smarter ticketing technology). Affordability is dependent on the exact pricing structure, however, simplifying the ticket process may enable people to have more visibility of the cheapest ticket options available to them. This structure may also reduce the need to buy multiple tickets and this is likely that will improve affordability. This could be particularly beneficial for lower income groups, elderly people and those with disabilities/limiting health conditions.

Medium Term: The structure of a harmonised and simplified ticket has the potential to improve affordability of rail for all, this could open this method of transport as a viable option for all groups, especially low-income groups.

Long Term: This could potentially create a more inclusive rail network. Rail can be potentially become a viable and affordable option for all groups.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

Ensure that transport options priced in line with existing services, and are competitive with other modes and travelling by car.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: The objective aims to improve station design and investment in infrastructure and rolling stock to create a pleasant and safe travelling environment, which is accessible for all, will avoid overcrowding and improve timetabling. These outcomes are likely to increase user perceptions of security. This may have perceived increases in user security and safety over the short term.

Medium Term: Improving station design and service provision, through providing lighting and CCTV where appropriate, should allow people to feel safer and consequently, encourage a perceived increase in security and community safety over the medium term.

Long Term: A perceived safer environment, with less crowding could attract more people to the stations over the long term, this may also have positive impacts in increasing perception of user security and safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

Ensure scheme design considers the requirement to implement safety measures, such as lighting and CCTV.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Whilst there is no specific mention to any safety measures or a reduction in cars on the road. There is mention of an improved, integrated rail network. The rail network should provide a viable alternative to car transport, which could create a mode shift from car to rail. Furthermore, the stations facilitating greater connections to bus, tram, cycle, car and walking routes could also make the journeys to/from the station shift from car to public transport/active travel. These mode shifts could ultimately reduce the number of accidents and other incidents by reducing the number of road km travelled by car.

Medium Term: These short-term benefits are likely to increase over the medium term, due to the time taken improving and integrating the rail network and then facilitating the connections to onward travel. However, making these modes viable and attractive transport options could create a mode shift to public transport and hence reduce accidents. This will be particularly beneficial for vulnerable road users, such as pedestrians and cyclists.

Long Term: As with medium term, it is likely that benefits will increase as the long-term strategy and infrastructure is developed further, to further improve and integrate the rail network.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Safety measures should take into account the needs of all transport users on the network, including pedestrians and cyclists as well as car drivers/passengers. Any new interchanges that could bring about high levels of traffic in the local area should have safe pedestrian access.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Any reduction in car trips by promoting a mode shift from car to public transport/active travel can have a positive impact on severance. Encouraging active travel at interchanges, by reducing the perception of severance, could help people increase their activity levels and consequently have positive impacts on their health.

Medium Term: Interchanges which enable more active travel have the potential to reduce the perception of severance. This is particularly beneficial for areas with high proportions of children and schools and no-car households. Furthermore, any reduction in car trips as a result of making rail or active travel a more attractive option, could reduce traffic in the area and therefore have a positive impact on perceived severance.

Long Term: As this is a long-term strategy, measures and infrastructure likely to facilitate mode shift and active travel could take time. Therefore, it is likely these benefits will be increased in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

It is important to appraise schemes to ensure they do not negatively impact on severance, and design schemes to reduce severance where possible. Liaise with relevant groups in order to ensure scheme design will lessen the impact of traffic most susceptible to severance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓✓	Local-Reg	MT-LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Making travel by rail a more attractive and viable option, as well as public transport/active travel to and from a train station, could encourage more people to travel by other means than by car. This is important for urban areas with high proportions of children or services that are likely to attract a high proportion children e.g. schools, nurseries and playgrounds, as they are more likely to be susceptible to negative effects of noise pollution. Furthermore, mode shift from car to rail may reduce emissions being produced by cars, consequently improving air quality. This would be beneficial on public health, particularly for children, older people, people with disabilities and those with respiratory illnesses.

Medium Term: The infrastructure used to increase the attractiveness of rail and active travel over car may take some time to implement, therefore, benefits in vibration, air, noise and light pollution could be increased over the medium term.

Long Term: As this is a long-term strategy, measures and infrastructure likely to facilitate mode shift and active travel could take time. Also, the uptake in people choosing the modes may not be immediate. Therefore, it is likely these benefits to vibration and air, noise and light pollution will be increased in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity, is important to consider urban areas and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and are also more likely to suffer health problems, consequently, any improvements would benefit them. Furthermore, children are particularly vulnerable to noise pollution, therefore it is important to consider the number of children and facilities such as schools in development areas. Furthermore, people with long term health conditions, such as Asthma will be particularly vulnerable to areas experiencing increases in air pollution.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Whilst there is no specific mention of any safety measures or a reduction in cars on the road, there is mention of an improved, integrated rail network. The rail network should provide a viable alternative to car transport, which could create a mode shift from car to rail. Furthermore, the stations facilitating greater connections to bus, tram, cycle, car and walking routes could also make the journeys to/from the station shift from car to public transport/active travel. These mode shifts could ultimately reduce the number of accidents and other incidents by reducing the number of km travelled by cars. Any new or improved stations could attract an increasing number of vehicles to the local area and therefore, could increase accidents in the vicinity near the new station.

Medium Term: The short-term benefits are likely to be increased over the medium term, due to the time taken improving and integrating the rail network and then facilitating the connections to onward travel. However, making these modes viable and attractive transport options could create a mode shift to public transport and hence reduce accidents. This will be particularly beneficial for vulnerable users including pedestrians and cyclists, which may include a high proportion of children and elderly people.

Long Term: It is likely benefits will be increased as the long-term strategy is developed further and the infrastructure is developed to further improve and integrate the rail network.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important that any new interchanges are fully accessible for all. It is also important to consider any local barriers/mitigations that improve safety for those wanting to use the station.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: The objective aims to improve station design and invest in infrastructure and rolling stock to create a pleasant and safe travelling environment, which is accessible for all, will avoid overcrowding and will improve timetabling. Therefore, any new and modernised infrastructure is likely to increase user perceptions of security and safety over the short term.

Medium Term: Improving the station design and incorporating suitable safety measures, could allow people to feel safer and therefore create improvements in perceived security and community safety. Benefits are considered to continue in the medium term.

Long Term: Embedded safety measures within the stations and on services will enhance the overall feeling of safety and security. A perceived safer environment could attract more people to the stations/services, this may also have positive impacts in increasing perception of user security and safety. Benefits are considered to continue in the long term.
Mitigation / Recommendations **Mitigation Measures:** See Mitigation Table 15. **Recommendations:** Consultation and research with key groups known to experience safety and security issues when travelling (children, elderly, females, BAME groups) would allow suitable safety measures to be implemented within any new services. When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

Appendix H. Assessment of Strategic Development Corridors

Table H-1 Assessment Tables Key

Terms		Effects					Assessment	
		Mag	Scale	Dur	T/P	Cert	Scale	Category
Mag	Magnitude	✓✓	Local	ST-MT	Temp	Low	**+++**	Large beneficial
Scale	Geographic Extent	✓	Local-Reg	ST-LT	Perm	Med	**++**	Moderate beneficial
Dur	Duration	-	Reg-Nat	MT-LT		High	**+**	Slight beneficial
T/P	Temporary / Permanent	?		ST			**0**	Neutral
Cert	Certainty	✗		MT			**-**	Slight adverse
ST	Short Term	✗✗		LT			**--**	Moderate adverse
MT	Medium Term						**---**	Strong adverse
LT	Long Term						**?**	Uncertain
Sm	Summary assessment						**+/-**	Combination of beneficial and adverse

H.1. SDC Summary Datasheet

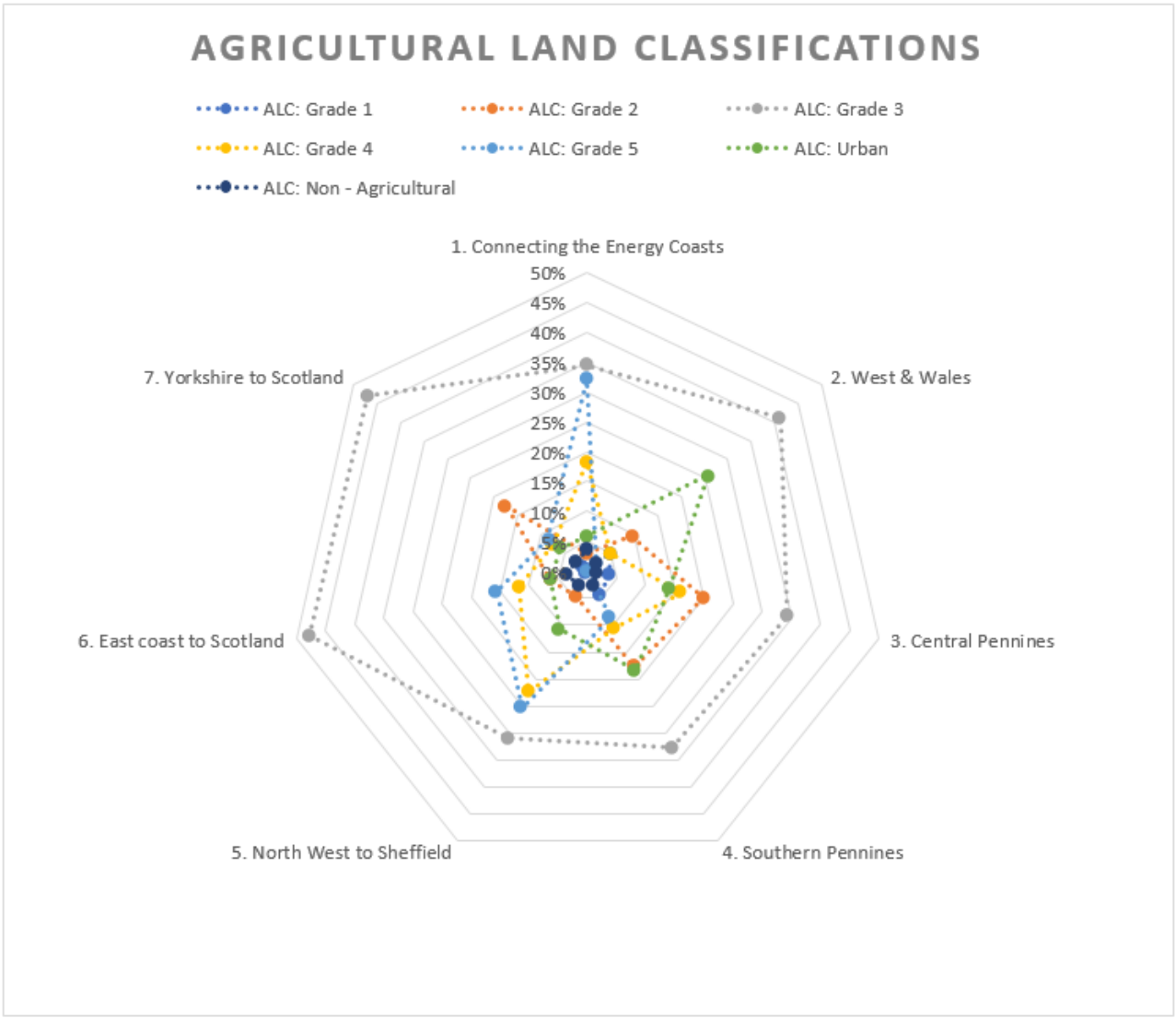
Table H-2 SDC Summary Datasheet

SDC Name / Feature	Strategic Development Corridors (SDC)																											
	1 Connecting the Energy Coasts				2 West and Wales				3 Central Pennines				4 Southern Pennines				5 North West to Sheffield City Region				6 East Coast to Scotland				7 Yorkshire to Scotland			
	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²	Count	Area (km²)	% Coverage	Number per km²
Whole SDC		14,937				3817				11479				9094				10545				10971				16708		
Total Population	3860273				2501718				8032860				7819344				5948520				2803810				4403945			
ISA Objective 4: Protect and enhance air quality																												
AQMA	11	4.21	0.03%	0.00	25	152.11	3.99%	0.01	64	203.52	1.77%	0.01	57	400.68	4.41%	0.01	48	282.77	2.68%	0.00	13	3.93	0.04%	0.00	32	66.03	0.40%	0.00
			Per Person >>	0.00000			Per Person >>	0.00006			Per Person >>	0.00003			Per Person >>	0.00005			Per Person >>	0.00005			Per Person >>	0.00000			Per Person >>	0.00001
ISA Objective 2: Protect and enhance biodiversity, geodiversity and the green infrastructure network																												
ISA Objective 3: Conserve and enhance the international sites (HRA specific objective)																												
ISA Objective 6: Protect and enhance the inland and coastal water environment																												
SAC	38	2014.03	13.48%	-	9	40.33	1.06%	-	19	470.69	4.10%	-	12	811.29	8.92%	-	31	1008.69	9.57%	-	26	630.51	5.75%	-	28	752.78	4.51%	-
SPA	7	1713	11.47%	-	3	53.45	1.40%	-	15	640.48	5.58%	-	10	817.57	8.99%	-	11	886.52	8.41%	-	9	543.46	4.95%	-	13	632.12	3.78%	-
SSSI	523	2489.21	16.66%	-	87	73.18	1.92%	-	208	713.58	6.22%	-	174	896.30	9.86%	-	331	1355.83	12.86%	-	260	768.6718	7.01%	-	394	914.89	5.48%	-
Ramsar	9	398.73	2.67%	-	8	64.43	1.69%	-	7	218.93	1.91%	-	8	390.96	4.30%	-	7	285.34	2.71%	-	7	52.09	0.47%	-	6	245.72	1.47%	-
NNR	38	166.93	1.12%	-	2	1.8	0.05%	-	9	45.12	0.39%	-	7	44.65	0.49%	-	24	60.22	0.57%	-	11	44.63	0.41%	-	15	78.85	0.47%	-
LNR	148	31.03	0.21%	-	90	25.4	0.67%	-	171	48	0.42%	-	197	60.735	0.67%	-	152	41.39	0.39%	-	133	25.47	0.23%	-	179	37.05	0.22%	-
pRamsar	0	N/A	N/A	-	0	N/A	N/A	-	0	0	0.00%	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-
pSPA	0	N/A	N/A	-	0	N/A	N/A	-	1	4.8	0.04%	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-
pSAC	0	N/A	N/A	-	0	N/A	N/A	-	1	2.71	0.02%	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-	0	N/A	N/A	-
Total Area Designated		6812.93	Per Person >>	0.00176		258.59	Per Person >>	0.00010		2144.31	Per Person >>	0.00027		3021.504	Per Person >>	0.00039		3637.99	Per Person >>	0.00061		2064.8318	Per Person >>	0.00074		2661.41	Per Person >>	0.00060
ISA Objective 5: Increase resilience of the transport network to extreme weather events and a changing climate																												
ISA Objective 6: Protect and enhance the inland and coastal water environment																												
Flood Zone 3	N/A	1120.12	7.50%	N/A	N/A	261.4	6.85%	N/A	N/A	1620.93	14.12%	N/A	N/A	1527.7	16.80%	N/A	N/A	901.54	8.55%	N/A	N/A	580.45	5.29%	N/A	N/A	2163.66	12.95%	N/A
			Per person >>	0.00029			Per Person >>	0.00010			Per Person >>	0.00020			Per Person >>	0.00020			Per Person >>	0.00015			Per Person >>	0.00021			Per Person >>	0.00049
Flood Risk Areas	-	0	N/A	-	-	510.01	13.36%	-	-	527.12	4.59%	-	-	750.59	8.25%	-	-	459.5	4.36%	-	-	0	N/A	-	-	131.4	0.79%	-
			Per Person >>	N/A			Per Person >>	0.00020			Per Person >>	0.00007			Per Person >>	0.00010			Per Person >>	0.00008			Per Person >>	N/A			Per Person >>	0.00003
Major River Basin Districts Intersections	North West (40.74%), Solway Tweed (19.75%) + Northumbria (39.51%)				North West (83.98%) + Dee (16.02%)				North West (38.74%) + Humber (61.26%)				North West (39.07%), Humber 60.10%) + Dee (0.84%)				North West (59.98%), Humber (19.03%) and Solway Tweed (20.99%)				Northumbria (56.94%), Solway Tweed (14.12%) + Humber (28.94%)				Humber 55.08%) Northumbria (33.38%) + Solway Tweed (11.54%)			
ISA Objective 7: Protect and conserve soil and remediate / avoid land contamination																												
Authorised Landfill Sites	168	23.059	0.15%	0.011	82.000	17.144	0.45%	0.021	293.000	45.698	0.40%	0.026	256.000	43.171	0.47%	0.028	206.000	24.368	0.23%	0.020	130.000	18.634	0.17%	0.012	251.000	43.744	0.26%	0.015
Historic Landfill Sites	1688	74.37	0.50%	0.11	1458	74.706	1.96%	0.38	3868	118.14	1.03%	0.34	3216	119.29	1.31%	0.35	946	87.95	0.83%	0.09	1297	59.03	0.54%	0.12	2030	89.14	0.53%	0.12
Total Area Designated		97.429	Per Person >>	0.00003		91.8499	Per Person >>	0.00367		163.8377	Per Person >>	0.00002		162.46	Per Person >>	0.00002		112.3178	Per Person >>	0.00002		77.6641	Per Person >>	0.00003		132.88	Per Person >>	0.00003
ALC: Exclusion	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A	N/A	0.00	0.00%	N/A
ALC: Grade 1	N/A	42.91	0.29%	N/A	N/A	185.05	4.85%	N/A	N/A	412.09	3.59%	N/A	N/A	412.67	4.54%	N/A	N/A	44.20	0.42%	N/A	N/A	9.60	0.09%	N/A	N/A	207.76	1.24%	N/A
ALC: Grade 2	N/A	455.68	3.05%	N/A	N/A	361.26	9.46%	N/A	N/A	2282.94	19.89%	N/A	N/A	1625.40	17.87%	N/A	N/A	486.53	4.61%	N/A	N/A	684.21	6.24%	N/A	N/A	2896.52	17.34%	N/A
ALC: Grade 3	N/A	5134.62	34.38%	N/A	N/A	1578.64	41.36%	N/A	N/A	3928.47	34.22%	N/A	N/A	2976.99	32.74%	N/A	N/A	3259.83	30.91%	N/A	N/A	5233.00	47.70%	N/A	N/A	7862.89	47.06%	N/A
ALC: Grade 4	N/A	2730.87	18.28%	N/A	N/A	185.68	4.86%	N/A	N/A	1843.71	16.06%	N/A	N/A	953.29	10.48%	N/A	N/A	2372.55	22.50%	N/A	N/A	1283.13	11.70%	N/A	N/A	1229.48	7.36%	N/A
ALC: Grade 5	N/A	4791.44	32.08%	N/A	N/A	74.76	1.96%	N/A	N/A	10.37	0.09%	N/A	N/A	782.49	8.60%	N/A	N/A	2665.37	25.28%	N/A	N/A	1707.34	15.56%	N/A	N/A	1417.88	8.49%	N/A
ALC: Urban	N/A	883.72	5.92%	N/A	N/A	982.91	25.75%	N/A	N/A	1604.38	13.98%	N/A	N/A	1669.62	18.36%	N/A	N/A	1146.55	10.87%	N/A	N/A	685.56	6.25%	N/A	N/A	996.39	5.96%	N/A
ALC: Non - Agricultural	N/A	544.35	3.64%	N/A	N/A	73.91	1.94%	N/A	N/A	182.70	1.59%	N/A	N/A	219.98	2.42%	N/A	N/A	274.93	2.61%	N/A	N/A	396.16	3.61%	N/A	N/A	440.42	2.64%	N/A
EA Special Sites	3	N/A	N/A	0.00020	7	N/A	N/A	0.00183	6	N/A	N/A	0.00052	12	N/A	N/A	0.00132	3	N/A	N/A	0.00028	2	N/A	N/A	0.00018	6	N/A	N/A	0.00036
ISA Objective 8: Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage																												
ISA Objective 9: Protect and enhance the character and quality of landscapes and townscapes																												
Battlefields	3	7.24	0.05%	0.00020	2	2.35	0.06%	0.00	4	12.35	0.11%	0.00	0	0	0%	0.00	1	3.44	0.03%	0.00	10	19.56	0.18%	0.00	12	30.16	0.18%	0.00
Scheduled Monuments	1717	64.57	0.43%	0.11	344	3.51	0.09%	0.09	1265	20.19	0.18%	0.11	655	13.2	0.15%	0.07	923	20.75	0.20%	0.09	2151	62.67	0.57%	0.20	2612	70.17	0.42%	0.16
Registered Parks and Gardens	94	63.07	0.42%	0.01	61	53.09	1.39%	0.02	144	94.66	0.82%	0.01	107	100.24	1%	0.01	109	60.27	0.57%	0.01	92	121.6	1.11%	0.01	121	177.89	1.06%	0.01
Total Area Designated		134.88	Per Person >>	0.00003		58.95	Per Person >>	0.00002		127.2	Per Person >>	0.00002		113.44	Per Person >>	0.00001		84.46	Per Person >>	0.00001		203.83	Per Person >>	0.00007		278.22	Per Person >>	0.00006
World Heritage Site	2	464.47	3.11%	0.00	1	5.93	0.16%	0.00	2	17.19	0.15%	0.00	1	4.89	0.05%	0.00	1	121.78	1.15%	0.00	3	97.27	0.89%	0.00	3	49.99	0.30%	0.00
			Per Person >>	0.00012			Per Person >>	0.00000			Per Person >>	0.00000			Per Person >>	0.00000			Per Person >>	0.00002			Per Person >>	0.00003			Per Person >>	0.00001
Listed Buildings	20891	N/A	N/A	1.40	10208	N/A	N/A	2.67	27887	N/A	N/A	2.43	20662	N/A	N/A	2.27	18978	N/A	N/A	1.80	18931	N/A	N/A	1.73	24684	N/A	N/A	1.48
Ancient Woodland	2507	N/A	N/A	0.17	1139	N/A	N/A	0.30	1317	N/A	N/A	0.11	1441	N/A	N/A	0.16	2969	N/A	N/A	0.28	1937	N/A	N/A	0.18	2115	N/A	N/A	0.13
AONB	5	2687.79	17.99%	0.00	0	0	0.00%	0.00	3	759.792	6.62%	0.00	2	207.26	2%	0.00	5	1030.08	9.77%	0.00	3	520.2	4.74%	0.00	3	519.489	3.11%	0.00
National Parks	4	3270.01	21.89%	0.00	0	0	0.00%	0.00	2	67.24	0.59%	0.00	1	564.36	6%	0.00	3	2335.22	22.15%	0.00	2	1932.84	17.62%	0.00	2	1664	9.96%	0.00
Total Area Designated (AONB + National Parks)		5957.8	Per Person >>	0.00154		N/A	Per Person >>	N/A		827.032	Per Person >>	0.00010		771.63	Per Person >>	0.00010		3365.3	Per Person >>	0.00057		2453.04	Per Person >>	0.00087		2183.489	Per Person >>	0.00050
ISA Objective 10: Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling																												
Total LA collected waste (tonnes)*	2798297				2090162				3903770				2710840				2074381				3349443				3349443			
			Per Person >>	0.72			Per Person >>	0.84			Per Person >>	0.49			Per Person >>	0.35			Per Person >>	0.35			Per Person >>	1.19			Per Person >>	0.76
LA collected waste not sent for recycling (as a %age of total SDC waste generated)*	57.57%				56.46%				58.44%				55.14%				58.63%				57.83%				57.83%			
ISA Objective 12: Enhance long term economic prosperity and promote economic transformation																												
Job Seekers Allowance (average of percentage values attributed to major intersecting LEPs)	1.75%				1.33%				1.50%				1.67%				1.50%				2.00%				2.00%			
GVA (sum of value (£billion) attributed to major intersecting LEPs)	£89				£104				£213				£208				£130				£65				£111			
Income Deprivaition (average of percentage values attributed to major intersecting LEPs)	26.75%				29.70%				27.00%				28.33%				24.75%				26.00%				26.80%			
ISA Objective 15: Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)																												
Life Expectancy - Female	82.05				82.23				82.27				82.28				82.05				82.57				82.46			
Life Expectancy - Male	78.03				78				78.12				78.13				78.05				78.53				78.44			
Child Obesity (average of percentage values of obese children in Year 6 attributed to major intersecting LEPs)	19%				18.30%				17.70%				18.00%				18.00%				18.67%				18.40%			
Bad and Very Bad Health (average of percentage values attributed to major intersecting LEPs)	7%				6.70%				6.50%				6.50%				6.80%				6.70%				6.60%			
ISA Objective 16: Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)																												
Crime Deprivation (average of percentage values attributed to major intersecting LEPs)	17.80%				22.00%				22.70%				23.30%				22.00%				13.00%				18.00%			

H.2. SDC Overview Graphs

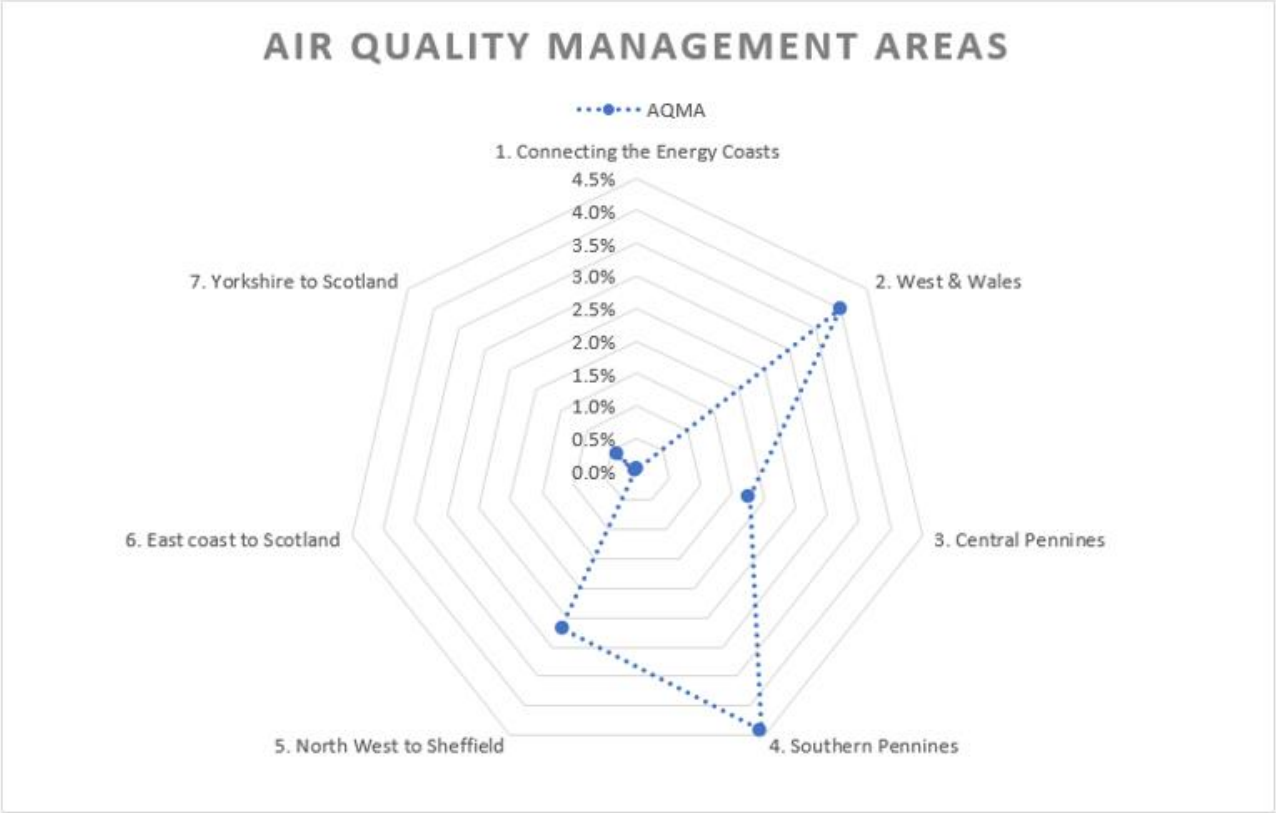
The following series of graphs present, comparatively, the degree to which various designations and assets are present within the respective Strategic Development Corridors (SDCs).

Figure H-1 Agricultural Land Classifications - Percentage SDC Coverage



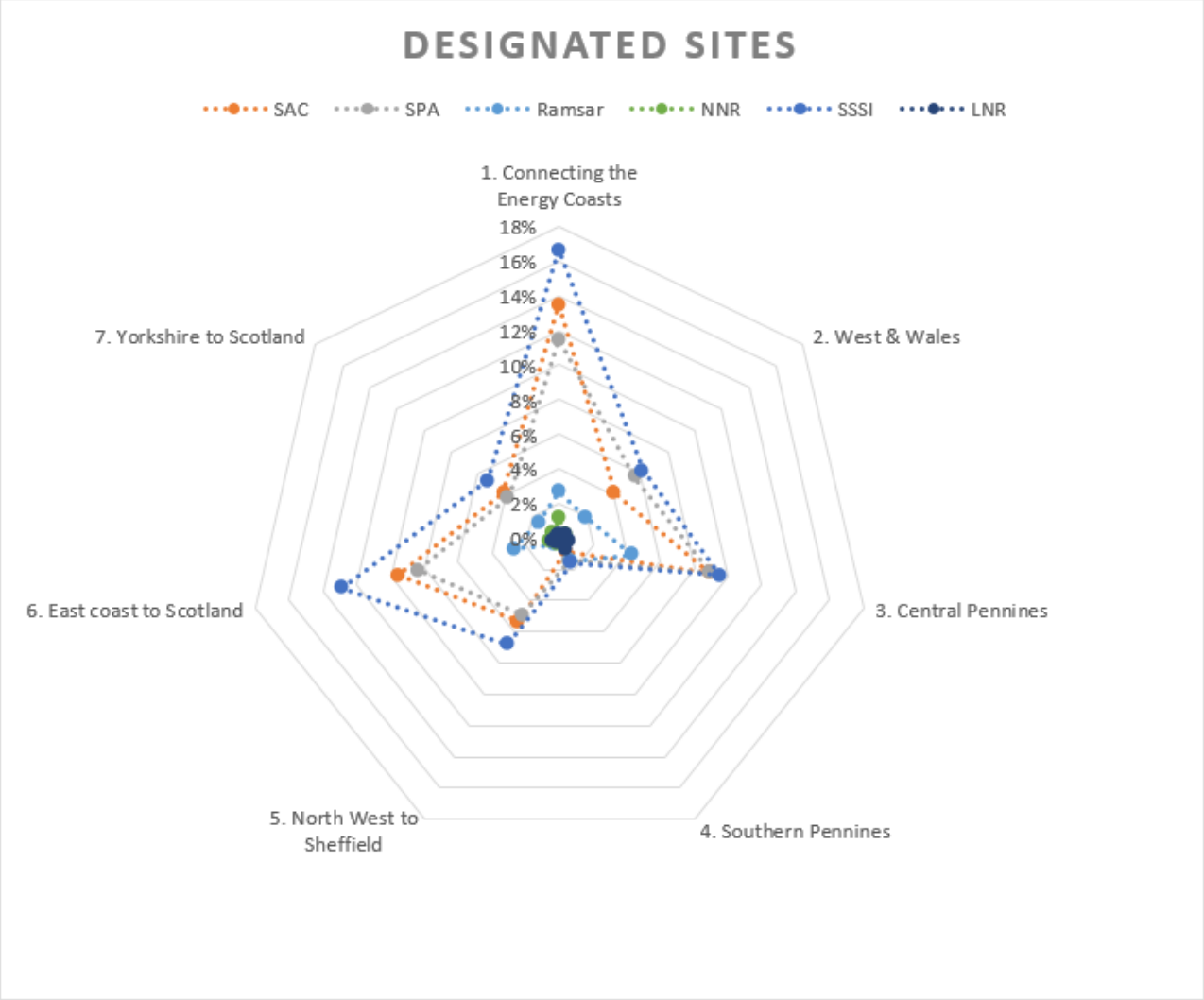
This graph compares the prevalence of seven agricultural land classifications (ALCs), including urban and non – agricultural classifications through plotting of percentage area coverage.

Figure H-2 Air Quality Management Areas - Percentage SDC Coverage



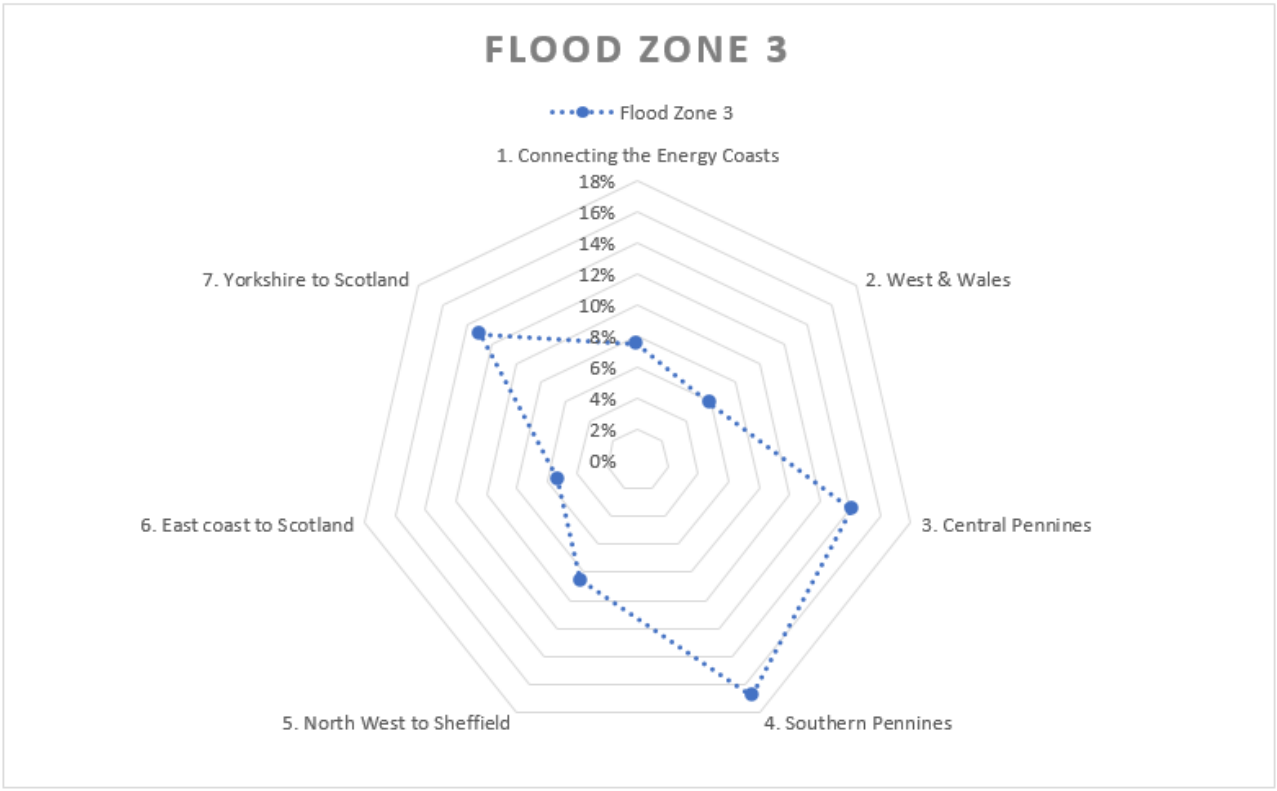
This graph plots the percentage area coverage of Air Quality Management Areas within each Strategic Development Corridor.

Figure H-3 Designated Sites - Percentage SDC Coverage



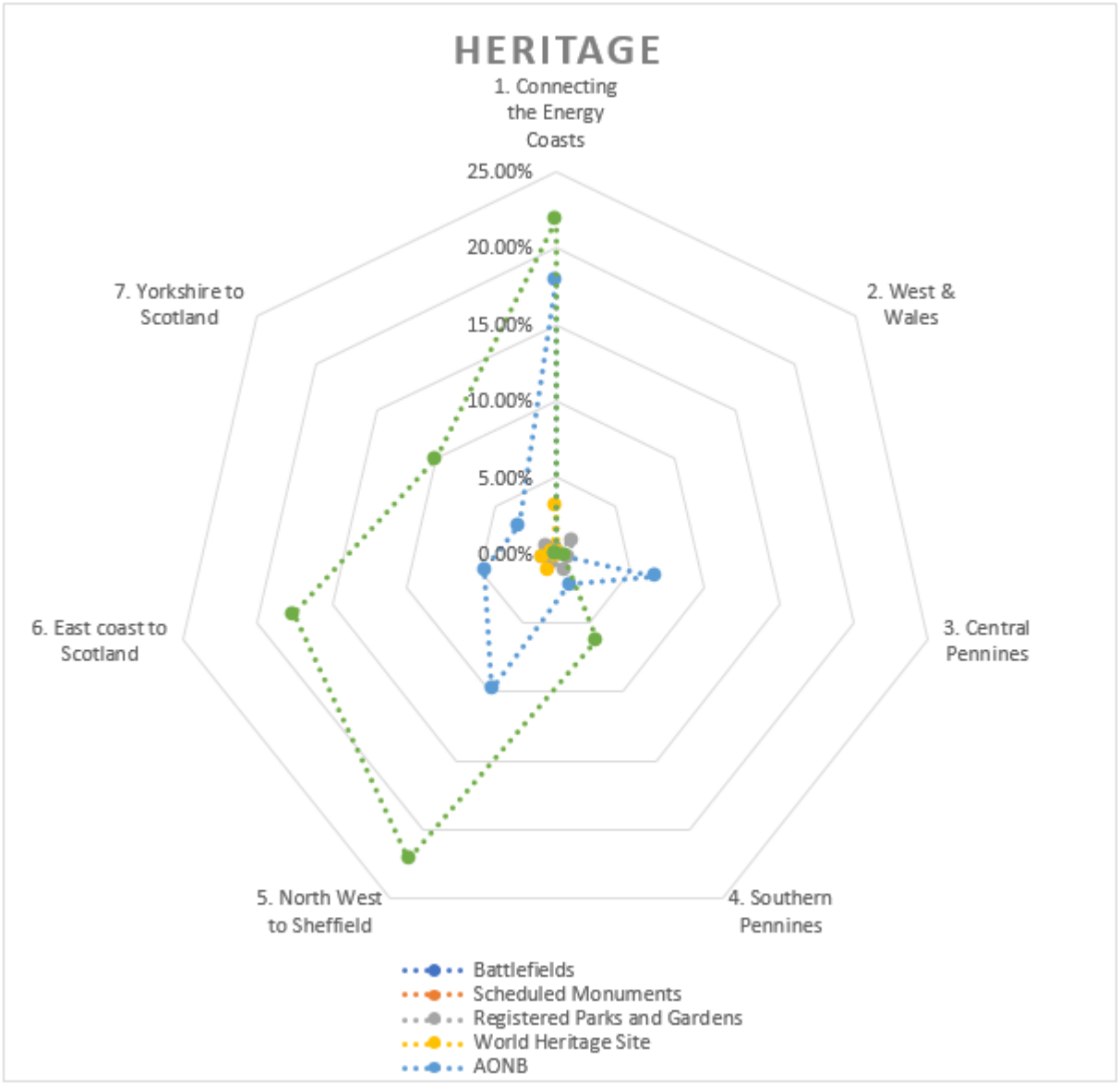
This graph shows the percentage area coverage of a range of designated sites, including internationally important SAC, SPA and Ramsar designations for each Strategic Development Corridor.

Figure H-4 Flood Zone 3 - Percentage SDC Coverage



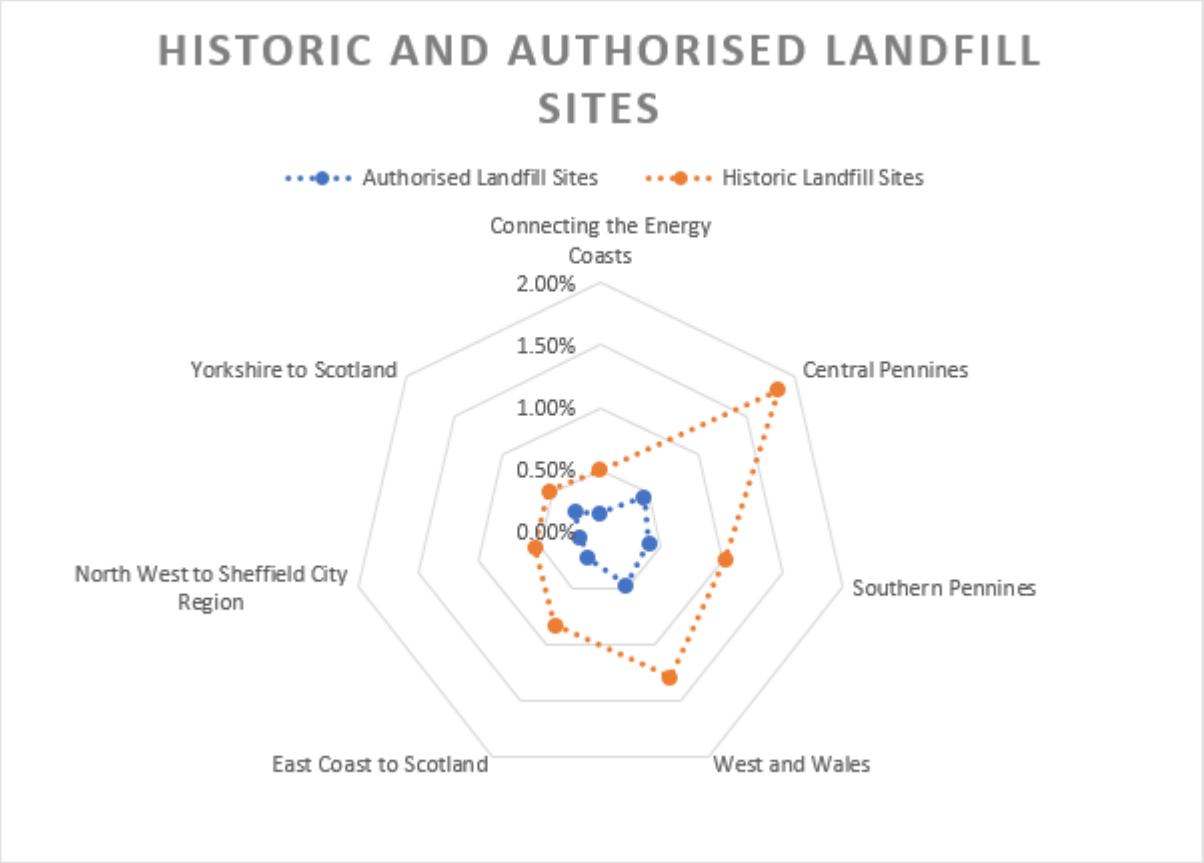
This graph plots the percentage area coverage of 'Flood Zone 3' classified land for each of the seven Strategic Development Corridor.

Figure H-5 Heritage Sites and Areas of Outstanding Natural Beauty (AONB) - Percentage SDC Coverage



This graph presents percentage area coverage figures for a range heritage and landscape assets, including Scheduled Monument, Registered Battlefields and Areas of Outstanding Beauty.

Figure H-6 Historic and Authorised Landfill Sites - Percentage SDC Coverage



This graph presents percentage area coverage of historic and authorised landfill sites across each of the seven Strategic Development Corridors.

H.3. SDC 1 Connecting the Energy Coasts

H.3.1. SDC 1 Datasheet

Table H-3 SDC 1 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	11	0.03	0.00011
Designated Sites	SAC	38	13.48	0.17649
	SPA	7	11.47	
	SSSI	523	16.66	
	NNR	38	1.12	
	Ramsar	9	2.67	
	LNR	148	0.21	
	WHS	2	3.11	0.01203
	EA Special Areas	3	N/A	-
	AONB	5	17.99	0.154
	National Parks	4	21.89	
Water	Flood Zones	1120.12km^2	7.50	-
	Flood Risk Areas	0km^2	-	-
Landfill	Authorised Landfill Sites	168	0.15	0.00252
	Historic Landfill sites	1688	0.50	
Agriculture	Agricultural Land Grades	Grade 1: 42.91 km^2	0.29	-
		Grade 2: 455.68 km^2	3.05	-
		Grade 3: 5134.62 km^2	34.38	-
		Grade 4: 2730.87 km^2	18.28	-
		Grade 5: 4791.44 km^2	32.08	-
		Urban: 883.72 km^2	5.92	-
		Non Agri: 544.35 km^2	3.64	-
Heritage	Listed Buildings	20891	-	-
	Registered Battlefields	3	0.05	0.00349
	Registered Parks and Gardens	94	0.42	
	Scheduled Monuments	1717	0.43	
Ancient Woodland	Ancient Woodlands	2507	N/A	-

H.3.2. SDC 1 Mapping

Figure H-7 SDC 1 - Agricultural Land Classifications

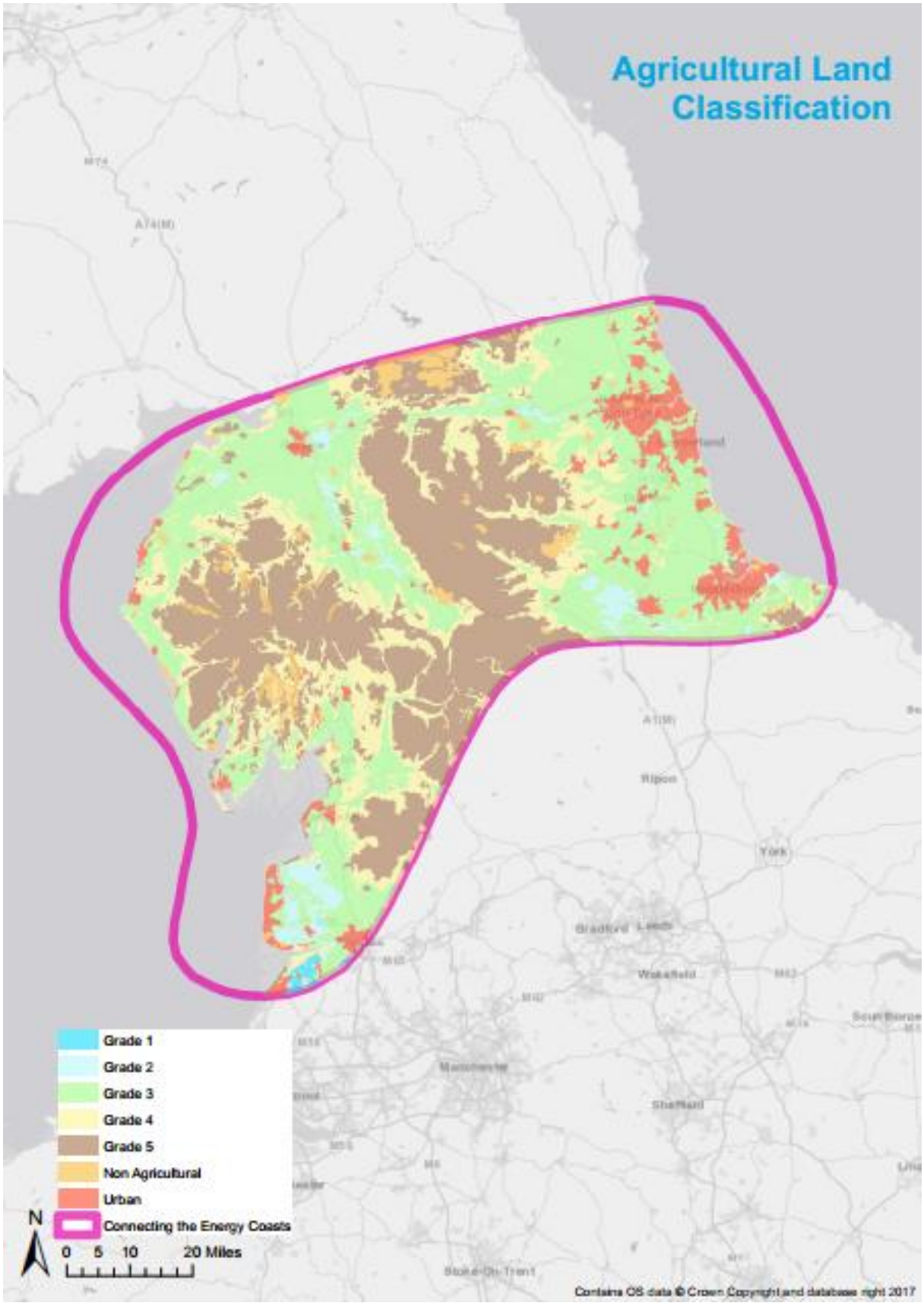


Figure H-8 SDC 1 - Air Quality Management Areas

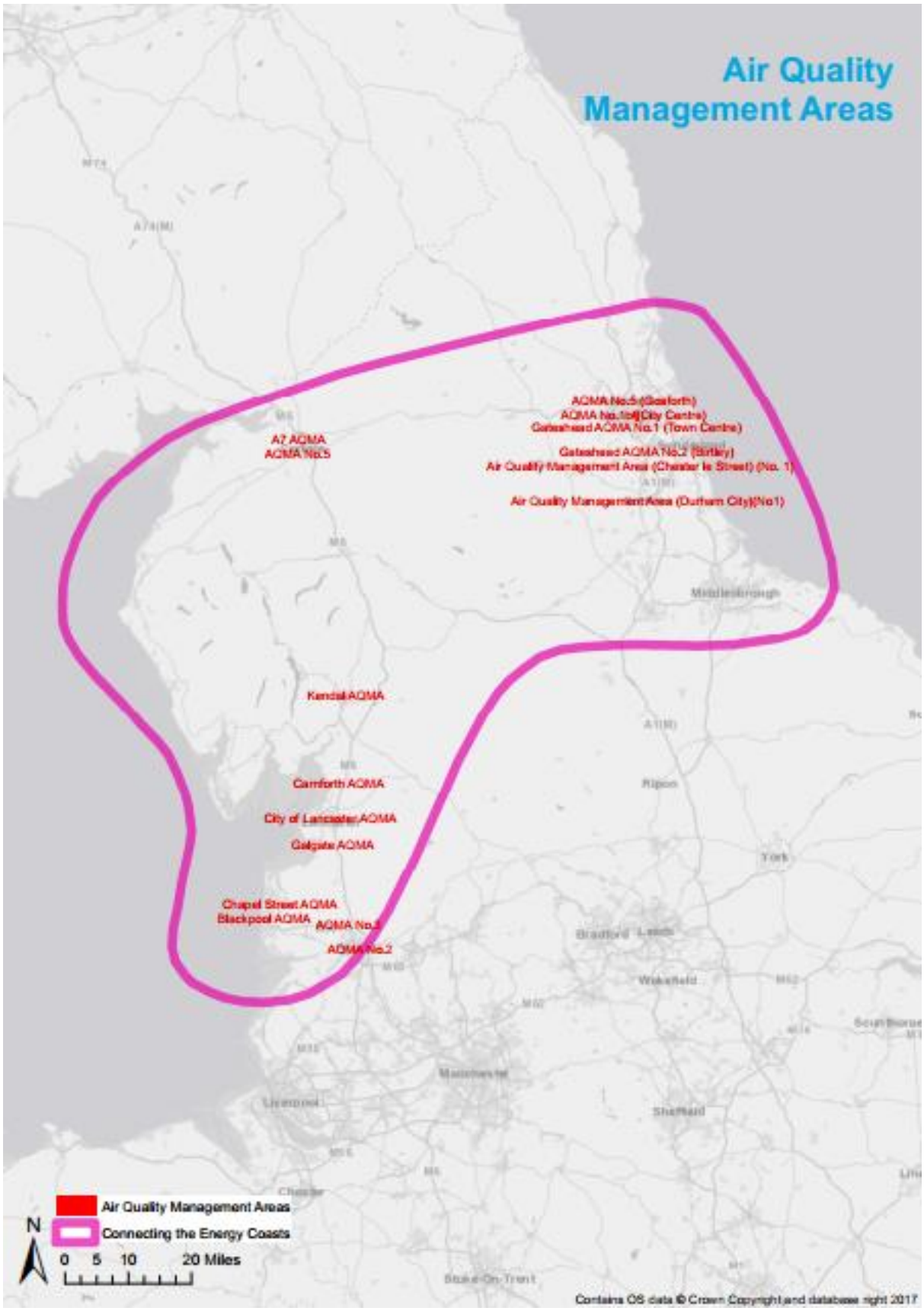


Figure H-9 SDC 1 - Ancient Woodlands

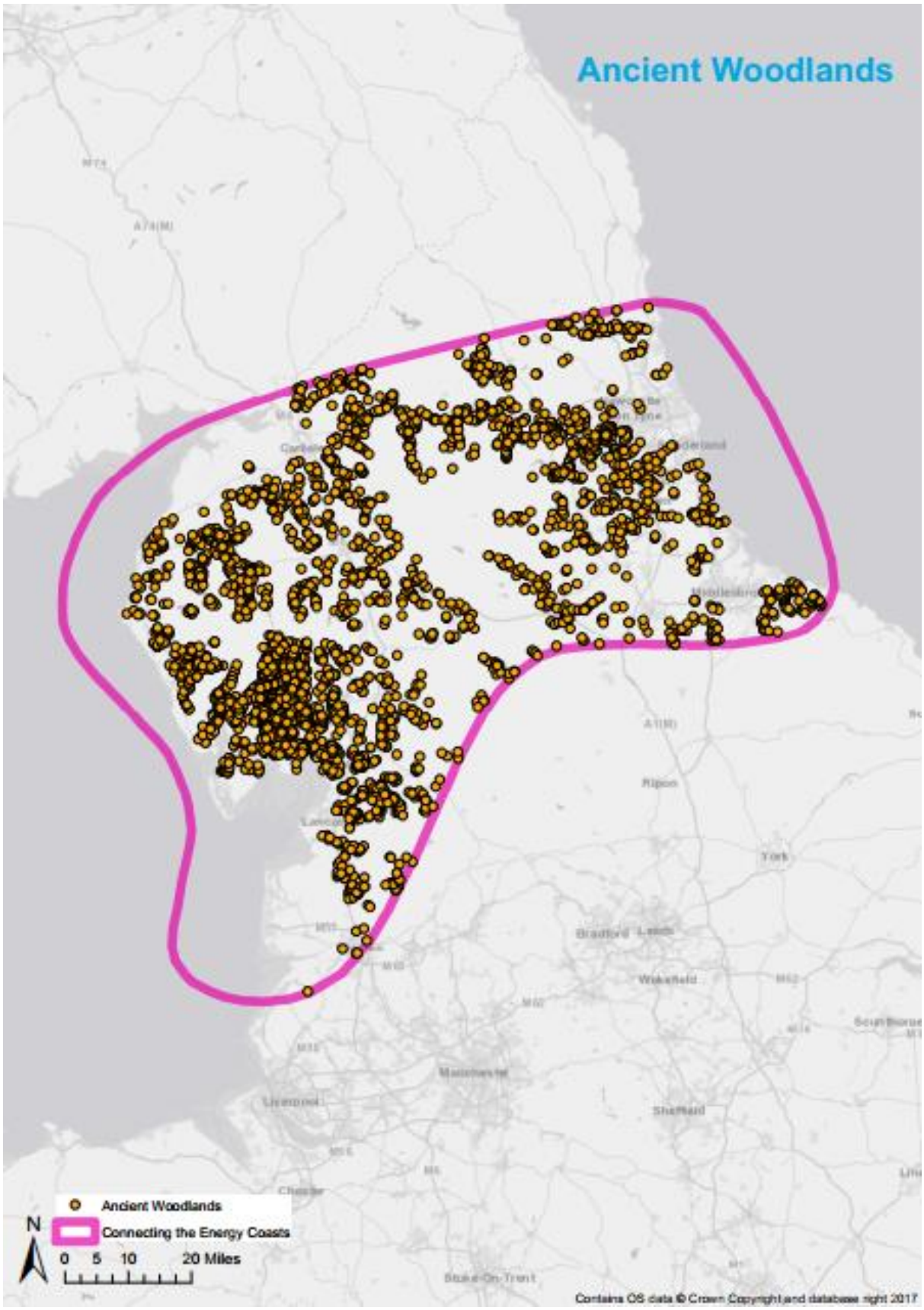


Figure H-10 SDC 1 - Designated Sites

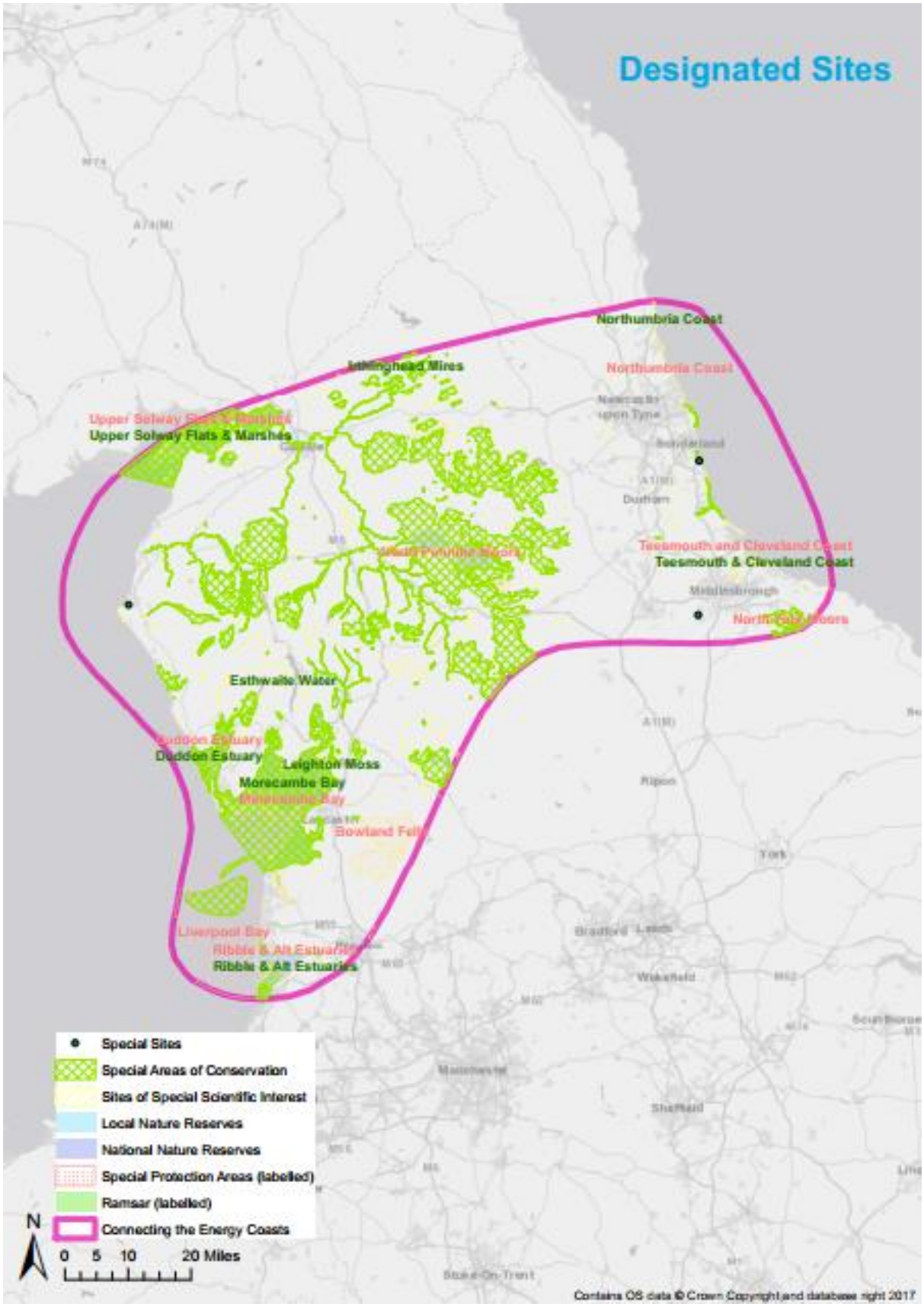


Figure H-11 SDC 1 - Heritage Sites

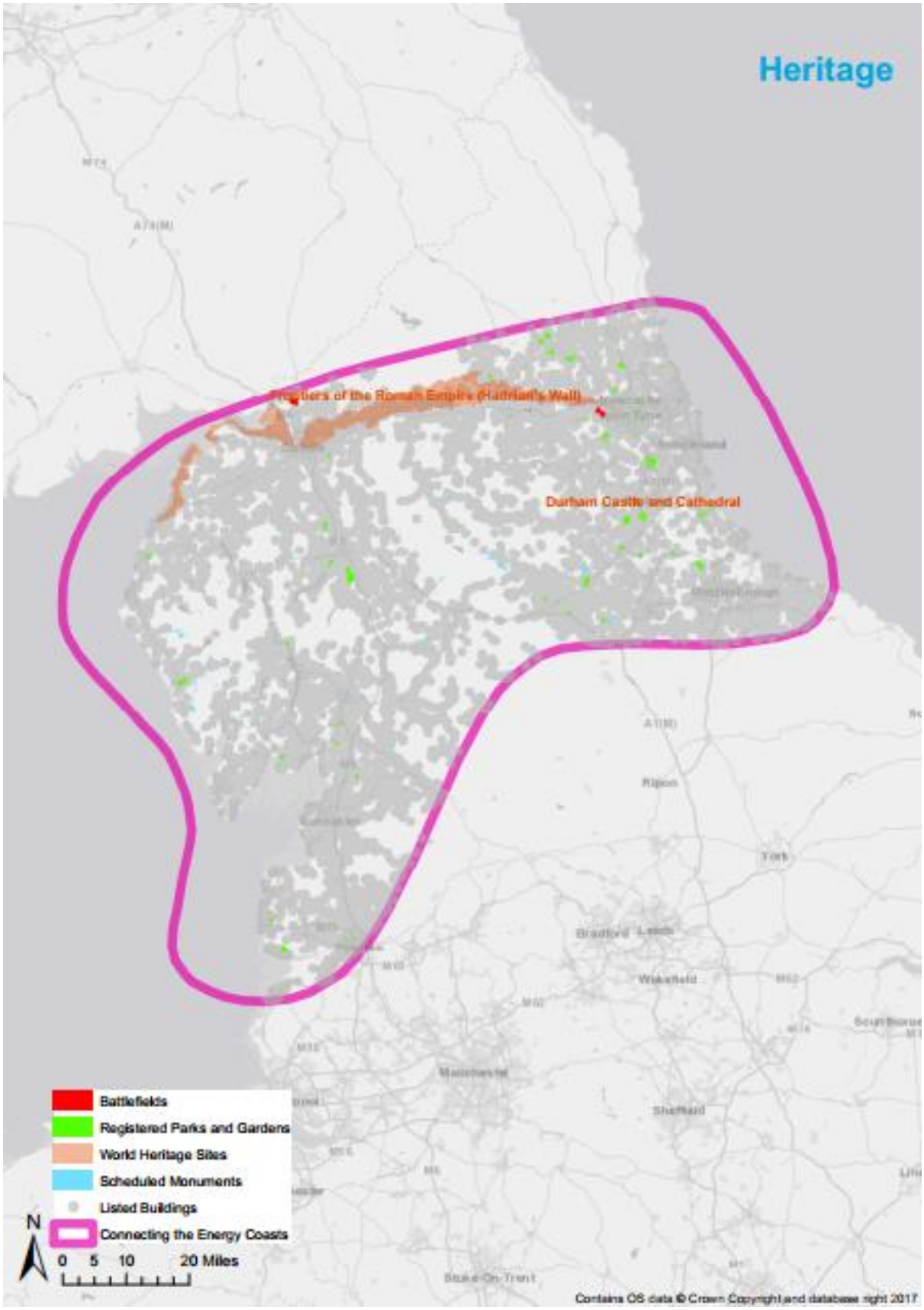


Figure H-12 SDC 1 - Historic and Authorised Landfill Sites

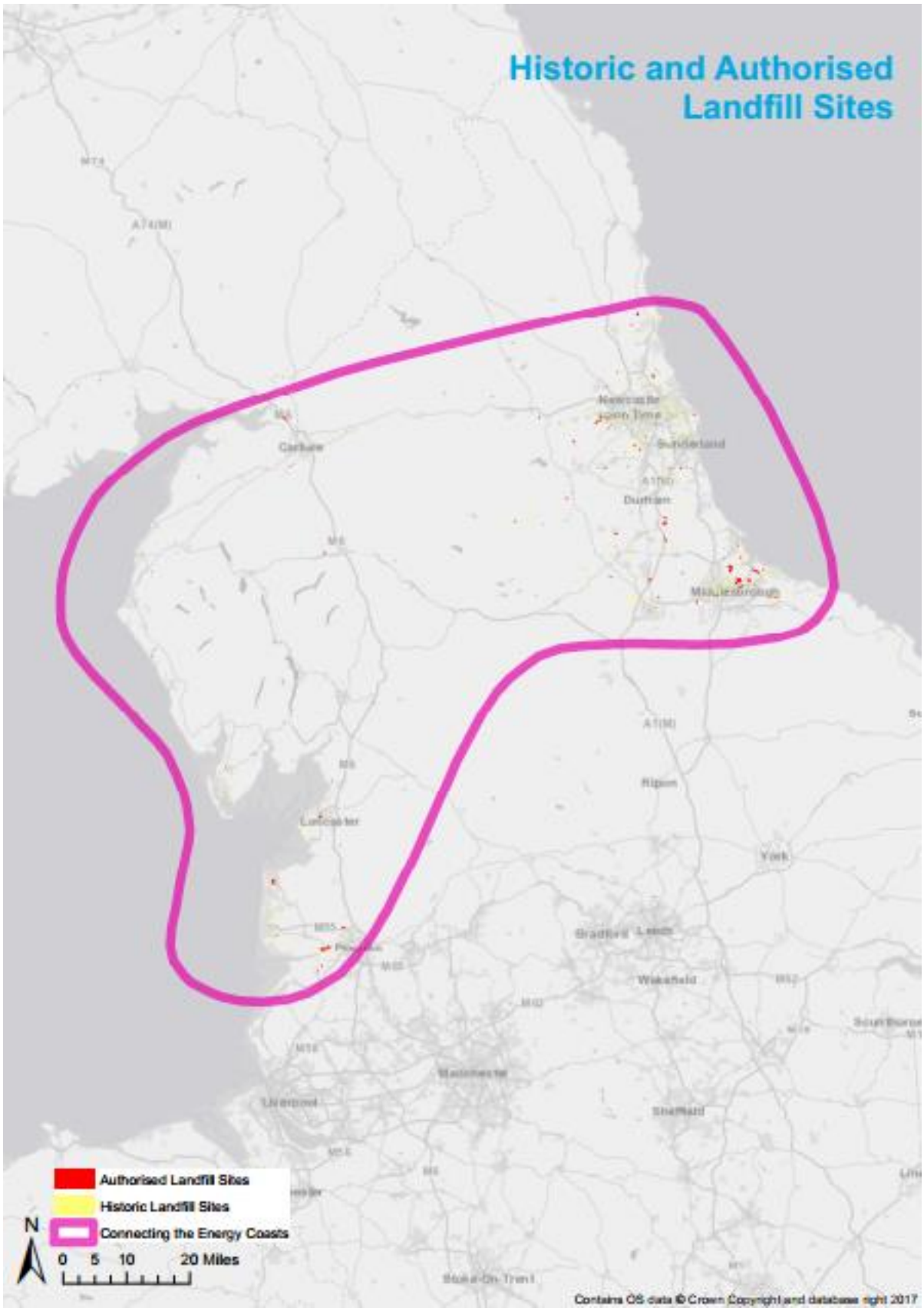


Figure H-13 SDC 1 - Landscape Designations

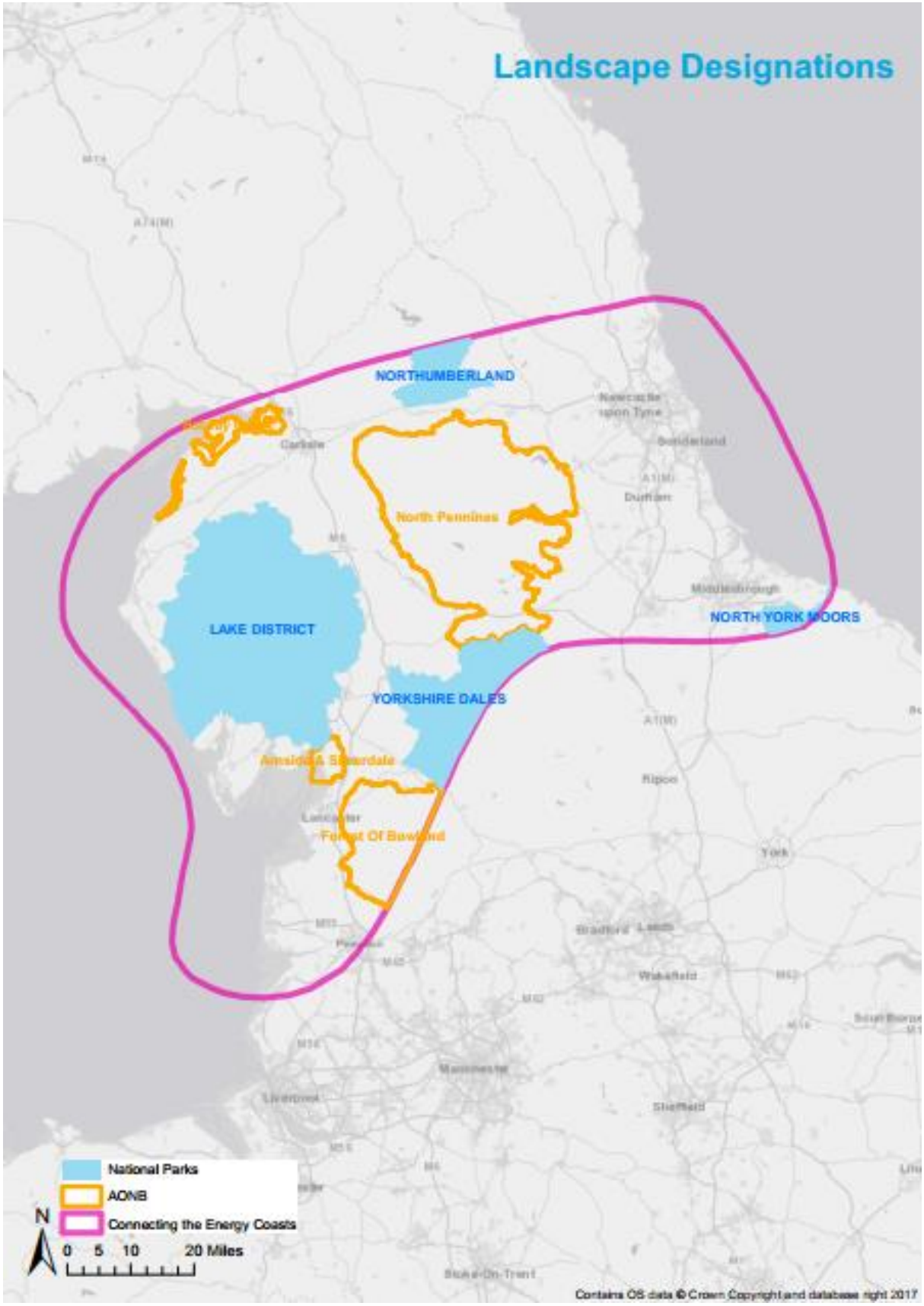
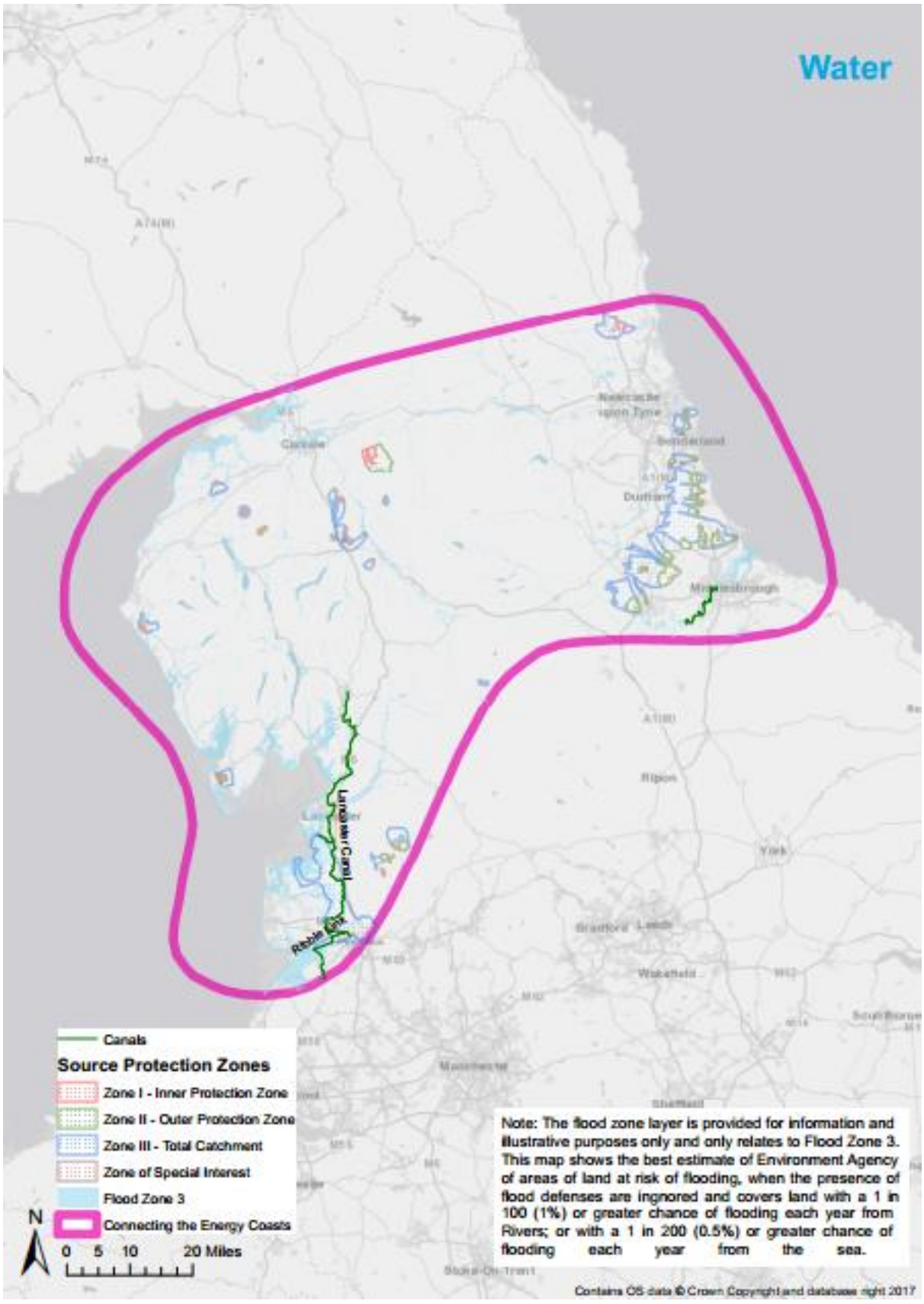


Figure H-14 SDC 1 - Water Features



H.3.3. SDC 1 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 1 Connecting the Energy Coasts (SDC 1) are as follows:

Assumed Intervention Types
Highways • New highway links • Highway infrastructure improvements **Railways** • New rail links • Rail infrastructure improvements • Station upgrades **Public transport (excl. rail)** • Park and ride schemes • Station and interchange works **Enabling infrastructure** • LZEV facilitating • Smart/adaptive roads • Digital connectivity

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 1 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

	Trip km	Increase		
	2015	2025	2035	2050
Rail	Low	Low	Low	Low
Road	High	Low	Med	High

CARBON

	CO_2e	Increase (Red) / Decrease (Blue)		
	2015	2025	2035	2050
	Low	Low	Low	Low
	High	Med	Med	High

Table H-4 Assessment of Strategic Development Corridors: SDC 1 – Connecting the Energy Coasts

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓✓/✗	Reg-Nat	LT	Perm	High	--	--	+++	+
Commentary **Short Term:** Relative to other SDCs, SDC 1 has high levels of GHG emissions from road sources and low from rail. Overall, contributions within SDC 1 are overwhelmingly from road based sources, with rail levels growing at a low level and road emissions growing at a medium level over the short term. Effects are anticipated to be medium adverse. **Medium Term:** By 2035, carbon emissions from road should continue to slightly be higher than 2015 levels, though lower than in the short term), as would emissions from rail. Effects are anticipated to be medium adverse. Downward trends are likely to be due in large part to uptake of LZEVs, decarbonisation of the electrical grid and continuing rail efficiency improvements **Long Term:** Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions (indicating a relatively low shift to rail in this SDC compared to other SDCs). Road emission decline is anticipated to be due primarily to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be large beneficial. Overall, **slight beneficial** effects are anticipated for SDC 1 in relation to this ISA Objective.									
Mitigation **Mitigation Measures:** See Mitigation Table 1.									
ISA Objective	**Effects**					**Assessment**			
	Mag	**Scale**	**Dur**	**T/P**	**Cert**	**ST**	**MT**	**LT**	**Sm**
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	-	+/-	+/-	-
Commentary **Short Term:** New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. Protected areas account for approximately 6,812km2 which is 45.61% of the total area of SDC 1. SDC 1 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. As such there is potential for some negative effects) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of the intervention. Effects are thus anticipated to be slight adverse. **Medium Term:** There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. **Long Term:** There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. Overall, it is anticipated that in relation to this ISA Objective, there would be **slight adverse** effects.									

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will lead to the full range of potential interventions from which there is a potential for effects (positive and negative) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **high risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that in relation to this ISA Objective in isolation, potential effects are currently **uncertain.**

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✕	Local-Reg	LT	Perm	High	--	--	-	-

Commentary

Short Term: Within this SDC, the vast majority of travel is undertaken by road and this is anticipated to increase at a low rate, relative to other SDCs. Rail travel is currently at a low rate in this SDC relative to other SDCs and while it is anticipated to increase, this will be at a relatively low rate. Emissions from road travel are anticipated to grow at a medium rate relative to other SDCs. There are 11 AQMA within this SDC, covering 0.03% of the area and this SDC is at low risk in terms of AQMA relative to other SDCs. The majority of road vehicles are anticipated to be fossil fuelled, although some improvements in emissions are expected from engine efficiency and other measures. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period (road to a medium level, rail at a low level, relative to other SDCs). During this period, significant growth in LZEVs is expected, and this should be reflected in a downward trend for overall pollutant emissions from road vehicles, though this would still be at medium level relative to other SDCs. Effects are anticipated to be medium adverse.

Long Term: While road travel levels are anticipated to have increased by a high margin relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEV. Rail travel will also have grown (at a low rate relative to other SDCs) and this, allied to the growth in LZEVs would result in continuing fall in overall pollutant emissions.

However, emissions from road are therefore anticipated to decrease to less relative to other SDCs, and this will mean that effects on air quality are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓/✗	Local	MT-LT	Perm	Med	+	-	-	-

Commentary

Short Term: Within this SDC, 1,120km^2 are located within Flood Zone 3, which makes up approximately 7.5% of the area. SDC 1 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience, including for example SuDS, are being put in place under implemented interventions (including infrastructure upgrades).

Medium Term: Length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new Infrastructure / Infrastructure upgrades and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, the greater level of road traffic, which is at medium growth compared to other SDC, will make resilience more problematic relative to other SDC. Effects are anticipated to be slight adverse.

Long Term: By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new Infrastructure / Infrastructure upgrades and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, this SDC has forecasted high levels of road traffic growth and this could make resilience difficult to achieve. Effects are considered slight adverse.

Overall, **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5. At present 7.5% of the SDC is in flood zone 3 and measures would be required to address these areas in particular.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/✗	Local	MT-LT	Perm	Med	+	-	-	-

Commentary

Short Term: This SDC is overwhelmingly located within the North West (41% of the SDC), Solway Tweed (20% of the SDC) and Northumbria (39% of the SDC) River Basins, with the WFD 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.

Medium Term: It is anticipated that there will be an uptake in LZEVs 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. However, greater levels of road traffic (medium level relative to other SDCs) may make protecting the water environment more difficult. This is considered adverse.

Long Term: It is anticipated that trends in increased LZEV would increase further, along smart mobility with digital connectivity, with resulting protection of the water environment. The use of SuDS on new transport interventions would also have increased in scale (as per WFD). However, greater levels of road traffic (high level relative to other SDCs) may make protecting the water environment more difficult. This is considered adverse.

Overall, **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: There is a range of Agricultural Land Classifications across SDC 1, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a) though there are also large areas of poorer soil typically upland areas in Cumbria and along the Pennines. Within this SDC approximate percentages of land of agricultural grade are 0.29% Grade 1 (low risk relative to other SDCs), 3.05% Grade 2 (low risk relative to other SDCs), 34.8% Grade 3 (high risk relative to other SDCs), 18.28% Grade 4 (high risk relative to other SDCS), and 32.08% Grade 5 (high risk relative to other SDCs), while 9.56% is classed as Urban or Non-Agricultural (high compared to other SDCs). Within this SDC there are three EA Special Sites identified, which are known to be contaminated. There are 168 Authorised Landfill sites (0.002% of the SDC area) and 1,686 Historic Landfill sites (0.5% of the SDC area). SDC 1 is considered **low risk** relative to other SDCs in terms of high value agricultural land and known contamination.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Overall, effects are anticipated to be **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of soil resources, particularly those of higher quality / areas of better agricultural lands (38.14% of the SDC area) should always be considered.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local	ST-LT	Perm	Low	--	-	-	-

Commentary

Short Term: Protected historic sites represent a total of about 4% of the SDC area and include the World Heritage Sites of Durham Castle and Cathedral and Frontiers of the Roman Empire (Hadrian's Wall), which receive 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 STP aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features e.g. historic railway stations. SDC 1 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. It is anticipated this will result in moderate adverse effects.

Medium Term: Levels of protection are also likely to increase for those tentative WHS within SDC 1 such as the Lake District and the twin Monastery of Wearmouth and Jarrow. Protection of the full range of known sites will continue and it is likely that new sites will join the list. Road use is anticipated to have medium growth relative to other SDC and together with already high relative levels, will result in effects that are anticipated to be slight adverse.

Long Term: 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.

Overall, a mix of **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHS of Durham Castle and Cathedral, Frontiers of the Roman Empire (Hadrian's Wall).

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✕	Local-Reg	ST-LT	Perm	High	--	-	-	-

Commentary

Short Term: There are two National Parks within the SDC 1 area (Lake District and North Yorks) and five AONBs, which make up 17.99% of the SDC area. SDC 1 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 1 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 etc. In some instances, though, there would be potential for enhancement. But for the most part effects are anticipated to be moderate adverse.

Medium Term: Areas currently protected for their landscape / townscape would still receive that protection, but new interventions would still represent new features in the landscape. However, screening would have reduced adverse effects.

Long Term: Those areas currently protected for their landscape /townscape would still receive that protection but any interventions would still represent new features in the landscape. However, screening would have reduced adverse effects.

Overall, a mix of **slight adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9. Effective protection of landscape / townscape assets during implementation of interventions under this SDC will be crucial.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Within this SDC, it is estimated that total local authority waste collected is 2,798,297 tonnes (0.72 tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 57.57% of LA collected waste is not sent for recycling. In terms of amount of waste generated and recycling rates, this SDC would be considered a medium priority, relative to other SDCs.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 1 area. Efforts to reach these targets should would be considered slight beneficial.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 1 area. Efforts to reach these targets should would be considered slight beneficial.

Overall, a mix of **slight beneficial** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10. Ensure measures are put in place to meet waste targets.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✗	Reg-Nat	ST-LT	Perm	High	--	--	-	--

Commentary

Short Term: The full range of transport interventions are proposed under this SDC and that would include some such as rail improvements and LZEV facilitating which support lower carbon, more affordable transport choice. However, this SDC would also include new highway construction and highway infrastructure improvements. Relative to other SDCs, SDC 1 has high levels of GHG emissions from road sources and low from rail. SDC 1 is thus considered to be **high priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV are anticipated to result in slight beneficial effects. By 2035, carbon emissions from road will continue to show medium growth (though with a downward trend relative to the short term), while rail will show a very low growth (though with a downward trend relative to the short term). This SDC has the lowest level of rail movement relative to the other SDCs. This can be considered medium adverse. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though new highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there are anticipated to be a high fall in carbon emissions from road based transport, with a continued low growth in rail emissions (indicating a relatively low shift to rail in this SDC compared to other SDCs). Effects are anticipated to be slight beneficial.

Overall, a mix of **moderate adverse** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓	Local-Reg	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: A number of inferences are made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 1 attributes one of the lowest GVA at approximately £89billion. Income deprivation is averaged at 26.75%, just below an SDC average of 27.05%. SDC 1 is found to have approximately 1.75% population receiving Job Seekers Allowance, which is higher than the average SDC. This would make this SDC a greater priority for growth.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 1 will benefit to a slight extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 1 area will increase by an additional £20.8bn and there will be an additional 217k jobs. This represents a slight beneficial effect relative to other SDCs.

Overall, **moderate beneficial** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. There are 35 Local Authorities in this SDC, which is the second highest number relative to other SDCs and is the second largest by area of the SDCs. This may make coordination more difficult. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. Full beneficial effects, though, may not be experienced in the short term.

Medium Term: It is anticipated that the introduction of a new Strategic approach will result in more effective delivery of major infrastructure. The size of the SDC and number of local authorities (relative to the other SDCs) may make coordination more difficult. There are also (relative to other SDCs) medium rates of road growth which can be more difficult to coordinate than rail. This is anticipated to be moderate beneficial.

Long Term: It is anticipated that the introduction of a new Strategic approach will result in more effective delivery of major infrastructure. The size of the SDC and number of local authorities (relative to the other SDCs) may make coordination more difficult. There are also (relative to other SDCs) high rates of road growth which can be more difficult to coordinate than rail. This is anticipated to be moderate beneficial.

Overall **moderate beneficial** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Enhancing strategic connectivity east to west, which is currently poor, has the potential to increase job opportunities within the area. This has the potential for a wide range of groups to access jobs, community centres and health and social care, who would have previously had poor access. However, any road enhancement could have some negative effects on communities (such as increased severance and air pollution), especially those in areas where a high proportion does not have access to a car.

Just over 5% of the population is Black and Minority Ethnic in the LEPs covering the Energy Coasts. This is lower than the average in the North and England. Approximately 9% of the population claim disability Living Allowance and 2% Job seekers allowance. This is in line with the average in the Northern Region. There are higher proportions of people aged over 65 in Cumbria and York, North Yorkshire and the Riding (20% and 21% compared to Northern average 17%).

Medium Term: Any improvements to infrastructure which will enhance connectivity to a wide range of services and jobs, for those who previously had poor access, could have beneficial impacts in the medium term. This improved access may help the regeneration of old industrial land and consequently aid jobs in the areas which are the most income deprived such as North Eastern and Tees Valley LEP (32% and 39% of people are the most income deprived compared to 28% across the Northern region).

Long Term: As with the medium term, any further improvements or increased uptake over time could have increased beneficial impacts on a range of communities.

Overall **slight beneficial** effects are anticipated for SDC 1 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. Also consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, so that any localised mitigation measures such as improved pedestrian crossings to reduce severance can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+	+	+

Commentary

Short Term: East to West connectivity enhancements have the potential to increase job opportunities. This has the potential for a wide range of groups to access jobs and health care, who would have previously had poor access. However, any road enhancements which lead to an increase in traffic and HGV content could have some negative health effects on communities, this is especially significant for those in deprived areas. Enhanced connectivity will also support tourism and leisure connectivity to some of the North's natural assets, such as the Lake District National Park. This improved access to leisure and outdoor facilities may promote health and wellbeing within communities. For the LEPs in this SDC, Tees Valley has the highest deprivation, with 37% of people in the 'most deprived' category, whereas York, North Yorkshire and East Riding currently has only 6% of people this category. Overall, in all the LEPs mentioned in the connecting the energy coasts corridor, 23% are in the most deprived quintile, this is lower than the Northern average. The highest percentage of people with bad and very bad health in the North are in North Eastern LEP (8% compared to Northern average of 7%). Life expectancy is the highest in the North in York, North Yorkshire and East Riding LEP, whereas Lancashire has one of the lowest life expectancies in the North.

Medium Term: Increasing the opportunities and access to health care services, especially for those in most need such as people with a disability and limiting health problems, should have beneficial effects. However, any road enhancements which have increased air and noise pollution levels could negatively affect communities.

Long Term: There is the potential for beneficial access to services. However, also there is the potential for increased air and noise levels with any road enhancements.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Any infrastructure improvements or modernised facilities in line with current safety requirements have the potential to improve perceived community safety.

14% of people within the LEPs in SDC 1 experience crime deprivation. This is below the average in the Northern region. Within SDC 1, the lowest crime rates are in York, North Yorkshire and the Riding and the highest crime rates within Tees Valley.

Medium Term: Any upgrades to facilities may improve perceived community safety medium term.

Long Term: As with the medium term, improvements may reduce perceived fear of crime.

Overall, effects are anticipated to be **slight beneficial** in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Also, when improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Connecting the East-West, which has previously had poor connectivity could improve accessibility for a wide range of people. This could improve access to services and jobs for those who do not currently have good access. This can include, those in deprived areas, people with disabilities and older people.

Medium Term: Infrastructure to connect the East to West, could improve employment within the areas. Currently Tees Valley and North East LEP have some of the highest estimated unemployment rates, therefore, improving accessibility to services and jobs could help unemployment, especially in deprived areas such as Tees Valley and North Eastern LEPs.

Long Term: Long term investment in connectivity between the North and North East can enhance connectivity over the long term, especially in areas with high levels of income deprivation

Overall, **moderate beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options. Whilst North Yorkshire and Cumbria LEP has very low income deprivation, both North Eastern and Tees Valley LEP have some of the highest income deprivation in the North.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number community and faith centres.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term beneficial effects.

Overall, **moderate beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. The Black and Minority Ethnic population within SD1 is lower than that of the North, the proportion of women is in line with that of the North and there is a slightly higher number of DLA claimants in Tees Valley and North Easter LEP compared to the North Region average.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Overall, **slight beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which high levels of pedestrians, Children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas or those with high levels of pedestrians and cyclists.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the medium term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should take into account the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public right of ways and pedestrian footpaths may have an increase in perceived severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children, older people or those in deprived areas.

Medium Term: Any potential effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential effects from increased/reduced air and noise pollution can have long term effects.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures See Mitigation Table 14.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Connecting the East-West, which has previously had poor connectivity could improve accessibility for a wide range of people. This could improve access to services and jobs for those who do not currently have good access. This can include, those in deprived areas, people with disabilities and older people.

Medium Term: Infrastructure to connect the East to West, could improve employment within some currently income deprived areas. Currently Tees Valley and North Eastern LEPs has some of the highest estimated unemployment rates, therefore, improving accessibility to services and jobs could help unemployment, especially in deprived areas such as Tees Valley and North Eastern LEPs.

Long Term: Long term investment in connectivity between the North and North East can enhance connectivity over the long term, especially in areas with high levels if income deprivation, which may also have high levels of health deprivation and disability. Tees Valley and North Eastern have higher levels of health and disability deprivation than the average across the North.

Overall, **moderate beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options. Whilst North Yorkshire and Cumbria LEP are not very income deprived, both North Eastern and Tees Valley LEP have some of the highest income deprivation in the North.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as healthcare.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term

Overall, **slight beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Overall, **slight beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which have high levels of pedestrians, Children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option will impact perceived severance differently. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have effects on perceived levels of severance. For example, severing public right of ways and pedestrian footpaths may have an increase in perceived severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. A higher proportion of people in Tees Valley and North East LEP are in bad and very bad health compared to the average across the North. Furthermore, Tees Valley and North Eastern LEP have high levels of health deprivation and disability compared to other areas within the North.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against. When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore, people which long term conditions, such as asthma will be particularly vulnerable in areas with increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Greater Manchester has below average killed or seriously injure for the North and Liverpool City region has slightly above average. However, any new links or enhanced road links that may increase the traffic or HGV content has the potential to increase accidents. Although, public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents.

Medium Term: There is the potential effect in the medium-term dependent on the infrastructure implemented. However, this depends on the number of vehicles travelling through specific road corridors and the uptake of public transport.

Long Term: The long term effect is dependent on the specific enhancement to road or public transport corridors.

Overall, a **mix of slight beneficial and adverse** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester and Leeds city region have higher than average crime levels for the North. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety.

Long Term: There could be improved community safety in the long term with the enhancement of services being developed over a number of years and the uptake taking a while to reach full potential.

Overall, **slight beneficial** effects are anticipated for SDC 1 in relation to this sub-objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

H.4. SDC 2 West and Wales

H.4.1. SDC 2 Datasheet

Table H-5 SDC 2 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	25	3.99	0.00608
Designated Sites	SAC	9	1.06	0.01034
	SPA	3	1.40	
	SSSI	87	1.92	
	Ramsar	8	1.69	
	NNR	2	0.05	
	LNR	90	0.67	
	WHS	1	0.16	0.00024
	EA Special Areas	7	N/A	-
	AONB	0	N/A	-
	National Parks	0	N/A	-
Water	Flood Zones	261.4km^2	6.85	0.01045
	Flood Risk Areas	510.01 km^2	13.36	0.02039
Landfill	Authorised Landfill Sites	82	0.45	0.00367
	Historic Landfill sites	1458	1.96	
Agriculture	Agricultural Land Grades	Grade 1: 185.05 km^2	4.85	-
		Grade 2: 361.26 km^2	9.46	-
		Grade 3: 1578.64 km^2	41.36	-
		Grade 4: 185.68 km^2	4.86	-
		Grade 5: 74.76 km^2	1.96	-
		Urban: 982.91 km^2	25.75	-
		Non Agri: 73.91 km^2	1.94	-
Heritage	Listed Buildings	10208	-	-
	Registered Battlefields	2	0.06	0.00236
	Registered Parks and Gardens	61	1.39	
	Scheduled Monuments	344	0.09	
Ancient Woodland	Ancient Woodlands	387	N/A	-

H.4.2. SDC 2 Mapping

Figure H-15 SDC 2 - Agricultural Land Classifications

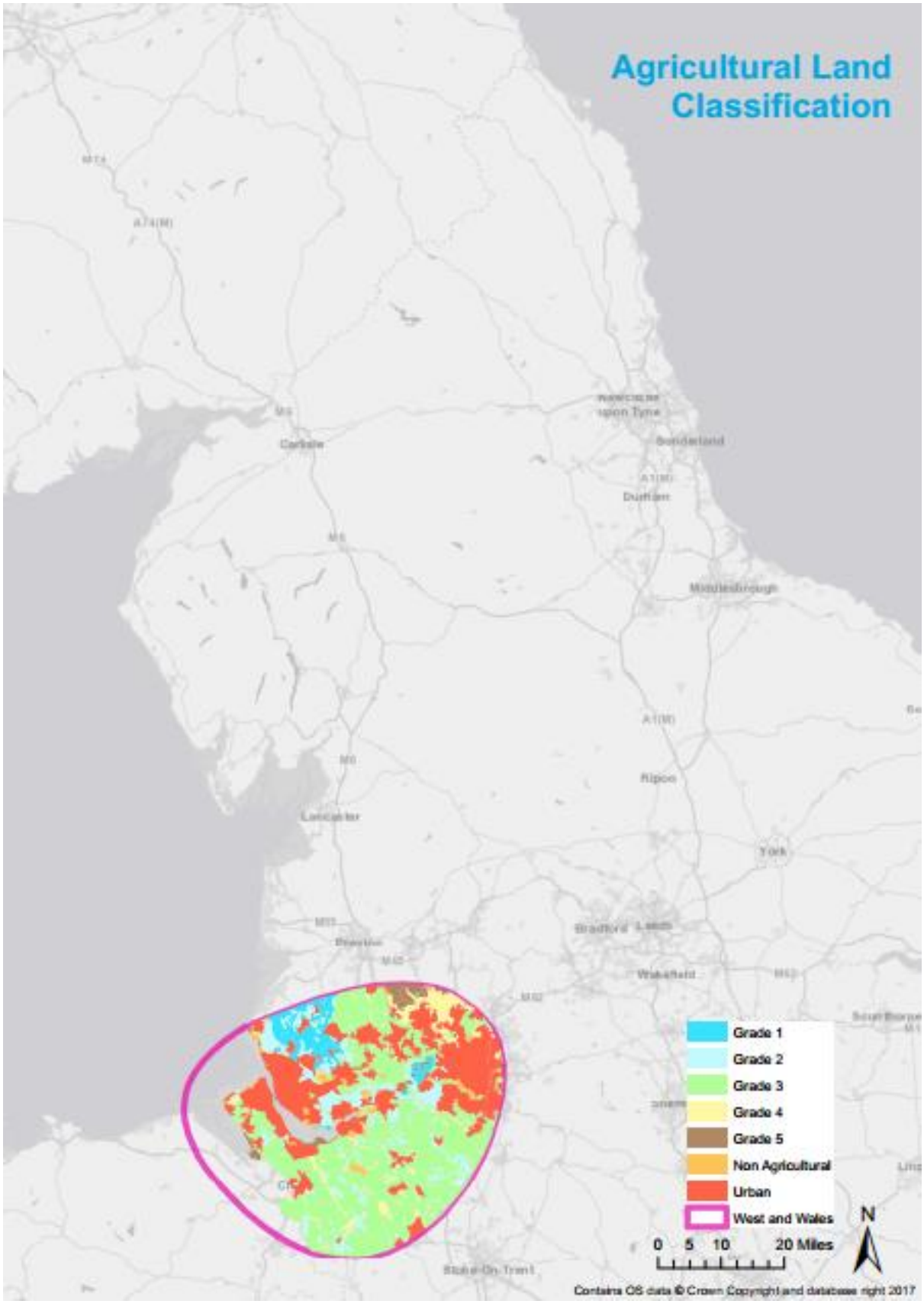


Figure H-16 SDC 2 - Air Quality Management Areas

Figure H-17 SDC 2 - Ancient Woodland

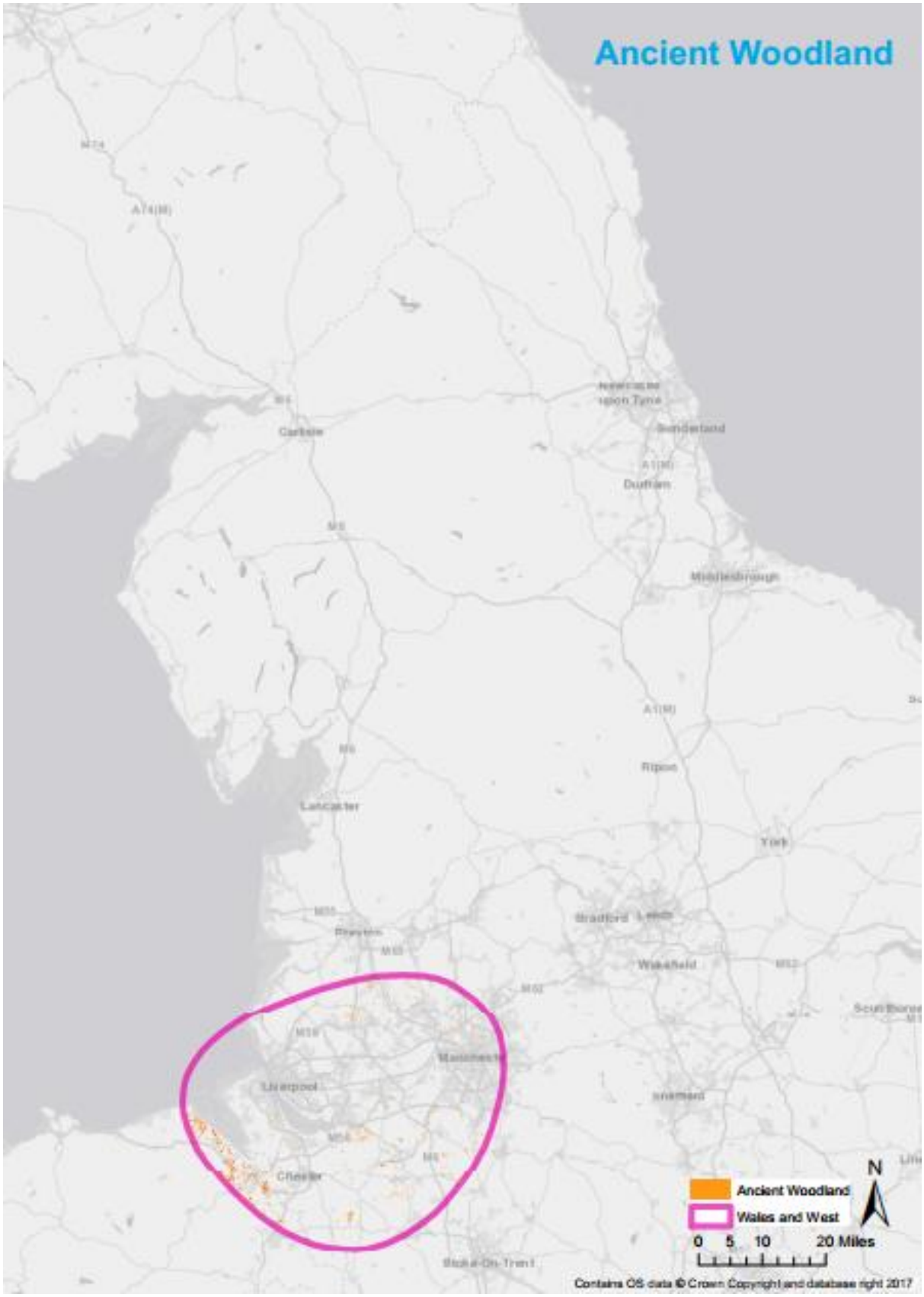


Figure H-18 SDC 2 - Designated Sites

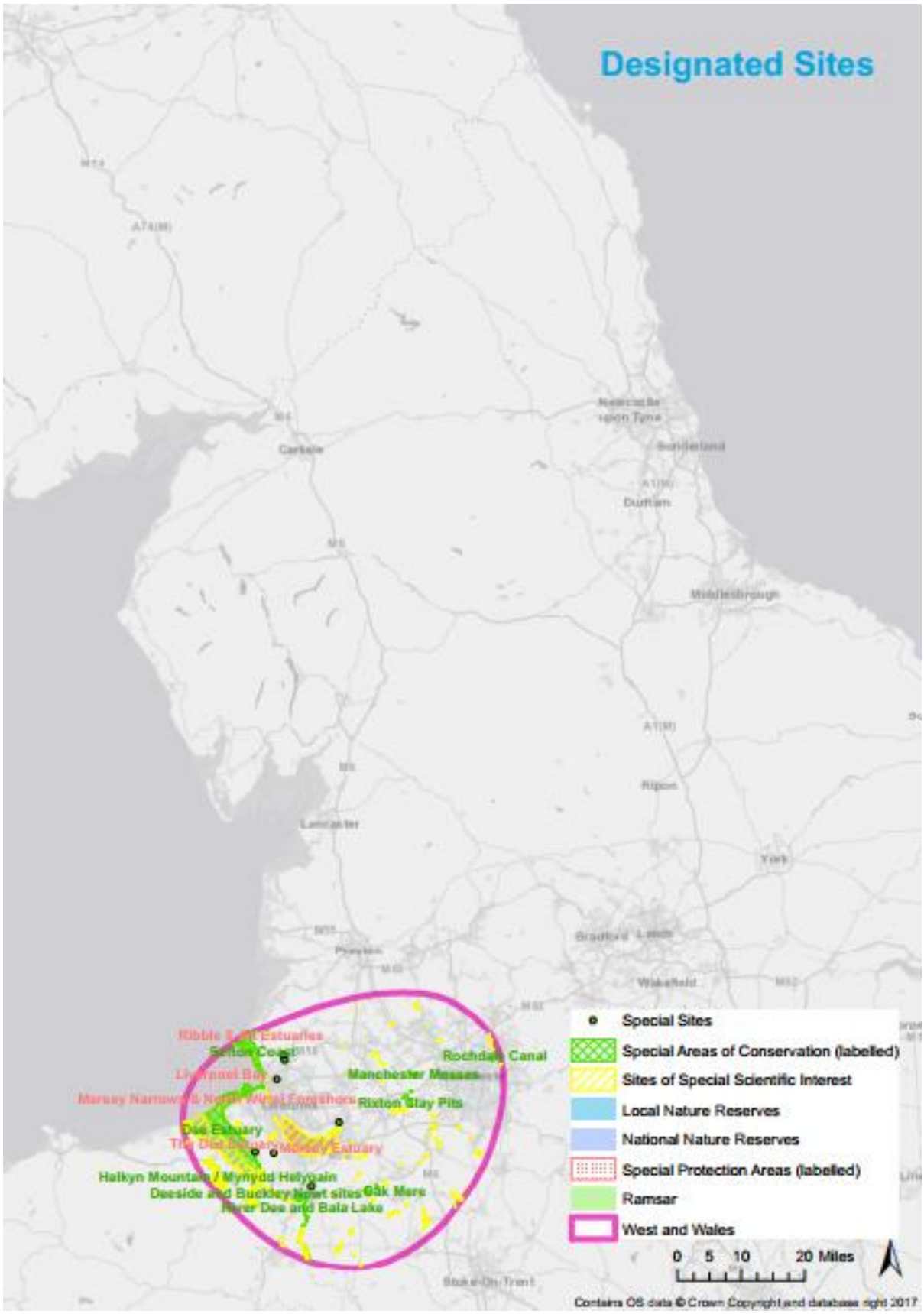


Figure H-19 SDC 2 - Heritage Sites

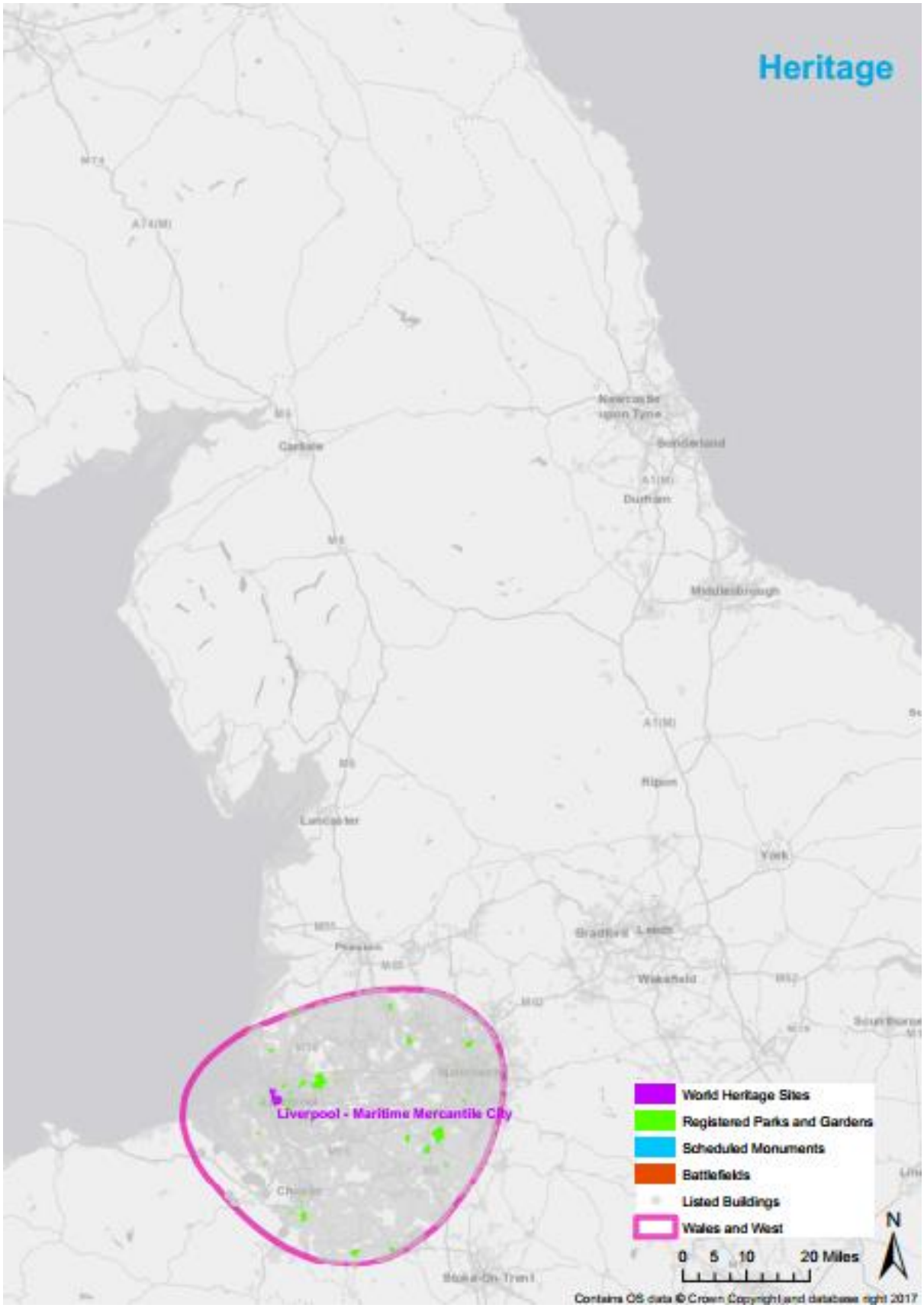


Figure H-20 SDC 2 - Historic and Authorised Landfill Sites

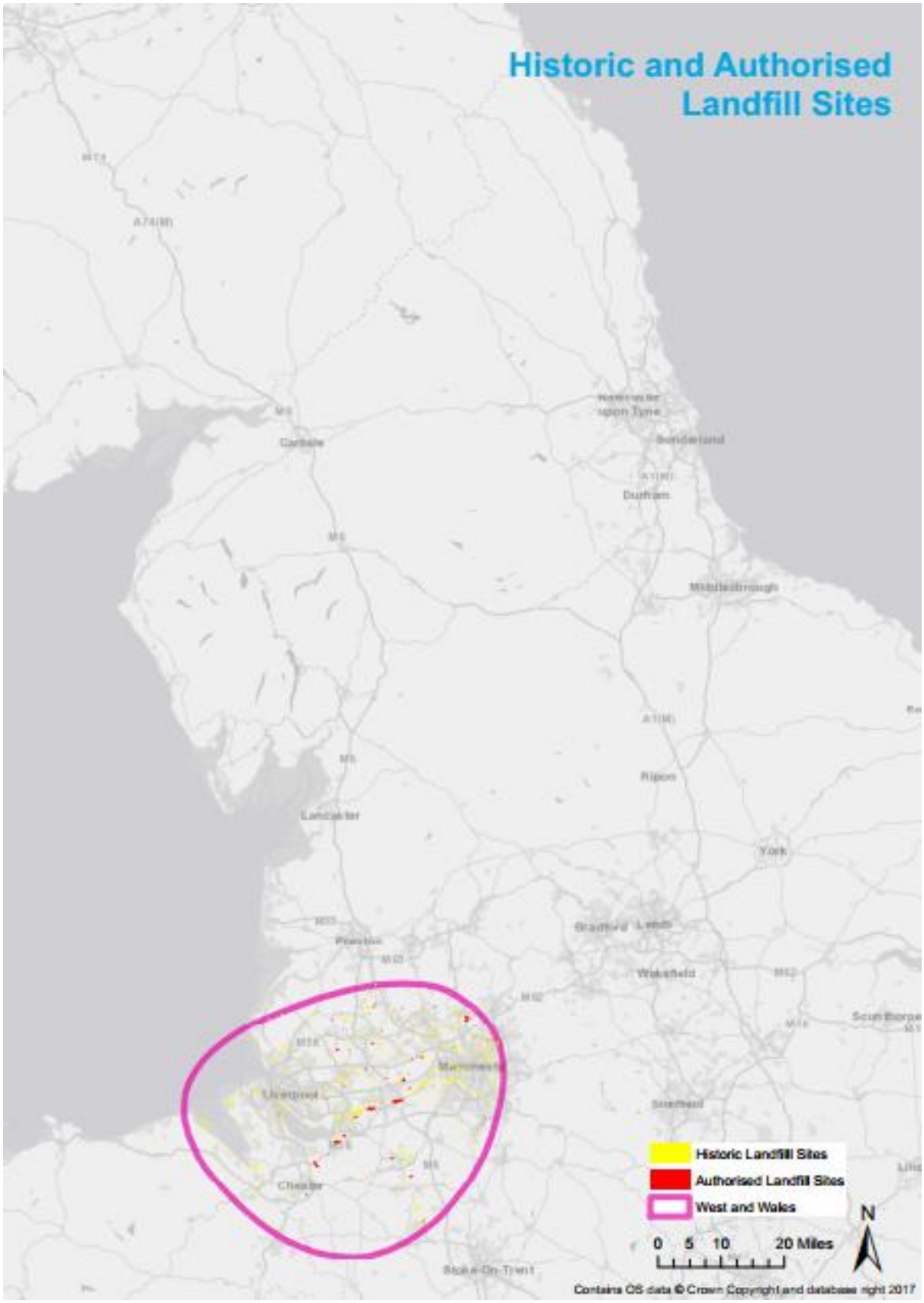
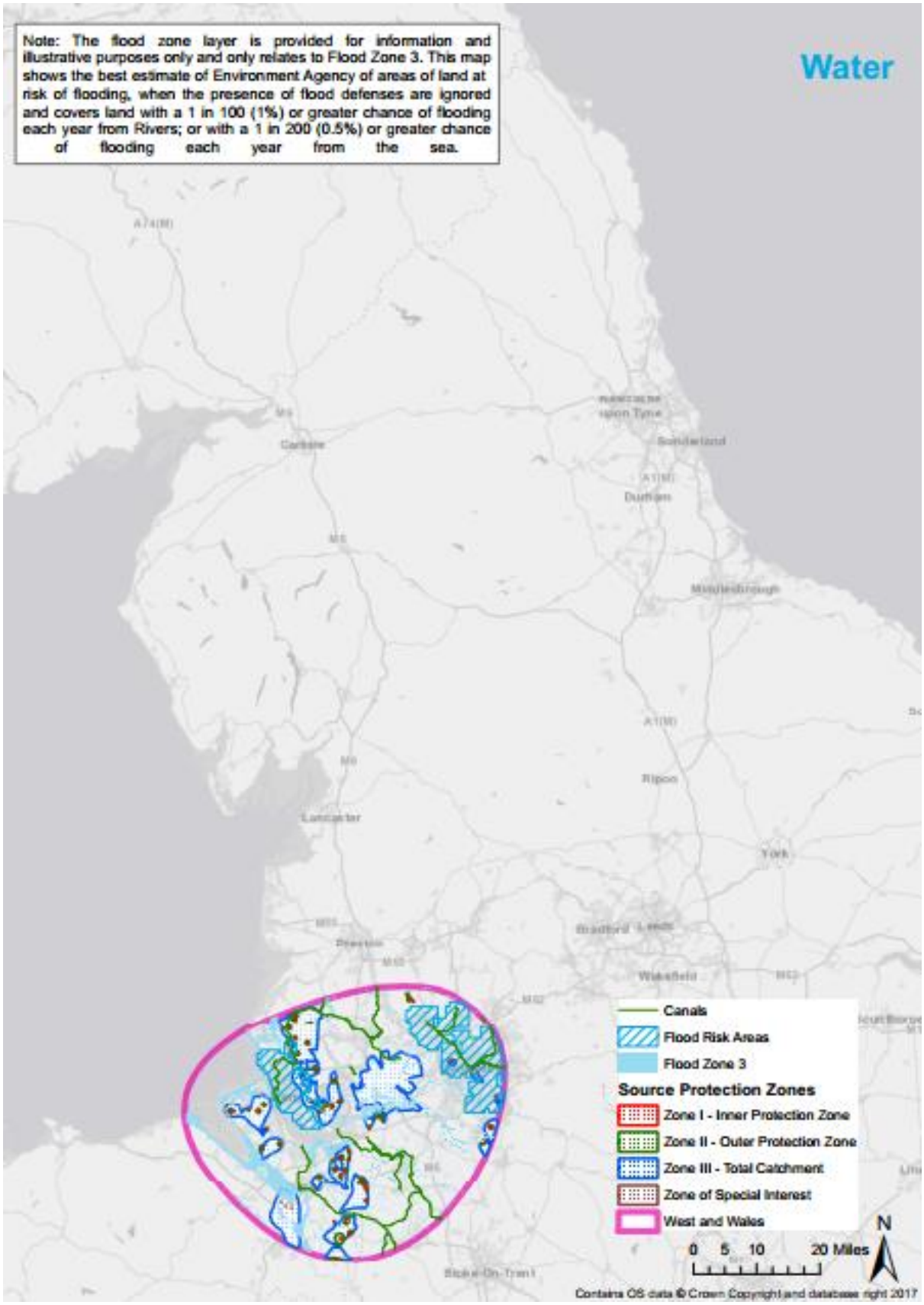


Figure H-21 SDC 2 - Water Features



H.4.3. SDC 2 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 2 - West and Wales (SDC 2) are as follows:

Assumed Intervention Types
Highways • New highway links • Highway infrastructure improvements **Railways** • New rail links • Rail infrastructure improvements • Station upgrades **Public transport (excl. rail)** • Park and ride schemes • Station and interchange works **Enabling infrastructure** • EV facilitating **Waterways** • Inland and coastal port upgrades • Use of canals

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 2 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

	Trip km	Increase		
	2015	2025	2035	2050
Rail	Med	Low	Low	Low
Road	Low	Low	Low	Med

CARBON

	CO_2e	Increase (Red) / Decrease (Blue)		
	2015	2025	2035	2050
Rail	Med	Low	Low	Low
Road	Low	Med	Low	High

Table H-6 Assessment of Strategic Development Corridors: SDC 2 – West and Wales

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓✓/✗	Reg-Nat	MT-LT	Perm	High	--	++	+++	++

Commentary

Short Term: Relative to other SDCs, SDC 2 has low levels of GHG emissions from road sources but medium levels from rail. Overall, contributions within SDC 2 are overwhelmingly from road based sources, with rail emission levels growing at a low level and road emissions growing at a medium level over the short term. Effects are anticipated to be medium adverse.

Medium Term: By 2035, carbon emissions from road should show a decline, while rail should show a very low growth (though with a downward trend relative to the short term). Effects are anticipated to be moderate beneficial. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid.

Long Term: Over the term to 2050, there is anticipated to be a high fall in carbon emissions from road based transport, with a continued low growth in rail emissions. Road emission decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be large beneficial.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Short term new transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity – for example through planting of native species. 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. As such effects are therefore a mix of positive and adverse. Protected areas account for approximately 258km2 which is 6.79% of the total area of SDC 2. SDC 2 is thus considered to be at **low risk** of negative effects against this ISA Objective, relative to other SDCs.

Medium Term: There is a potential for both positive and negative effects depending upon the nature and location of potential interventions, though the low sensitivity of this SDC and anticipated low road growth (relative to other SDCs) may mean that there is a tendency toward positive effects relative to other SDC.

Long Term: There is a potential for both positive and negative effects depending upon the nature and location of potential interventions, though the low sensitivity of this SDC and anticipated low road growth (relative to other SDCs) may mean that there is a tendency toward positive effects relative to other SDC.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include the full range of potential interventions, from which there is potential for effects (positive and negative) from the new / upgraded infrastructure, depending upon the nature and location of interventions. This SDC is at low relative risk in relation to other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, potential effects are **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Tables 2 and 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	LT	Perm	High	--	++	++	++

Commentary

Short Term: Within this SDC, the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a medium rate in this SDC relative to other SDCs and, while it is anticipated to increase, this will be at a low rage compared to other SDCs. There are 25 AQMAs in this SDC, covering 3.99% of the area and this SDC is at high risk relative to other SDCs. The majority of road vehicles are anticipated to be fossil fuelled, although some improvements in emissions are expected from engine efficiency and other measures. Emissions from road travel are anticipated to grow at a medium rate relative to other SDCs. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period (both at a low level relative to other SDCs). During this period, significant growth in LZEVs is expected and this is reflected in a downward trend for emissions from road vehicles, with an overall decline in emission levels. Effects are anticipated to be moderate adverse.

Long Term: While road travel levels are anticipated to have increased by a medium rate relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEVs. Rail travel will also have grown (at a low rate relative to other SDCs) and this, allied to the growth in LZEVs, would result in continuing fall in overall pollutant emissions. Emissions from road are therefore anticipated to decrease at a high level relative to other SDCs and this would mean that effects on air quality are anticipated to be moderate beneficial.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓/✗	Local-Reg	MT-LT	Perm	Med	+	+	-	+

Commentary

Short Term: Within this SDC, 261.4km^2 are located within Flood Zone 3, which makes up approximately 6.85% of the area. SDC 2 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience, including for example SuDS, are being put in place under implemented interventions (including infrastructure upgrades).

Medium Term: Length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure, and the uptake of measures such as SuDS would continue to cover a greater proportion of the SDC. It is anticipated that road traffic levels will grow at a low rate relative to other SDC and this may make resilience easier to achieve. Effects are anticipated to be slight beneficial.

Long Term: By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure, and the uptake of measures such as SuDS would continue to cover a greater proportion of the SDC. This SDC has forecasted medium growth in road traffic levels relative to other SDCs, and this could make resilience more difficult to achieve. Effects are anticipated as slight adverse.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/✗	Local	MT-LT	Perm	Low	+	+	-	+

Commentary

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 WFD 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. This SDC has low volumes of road based travel relative to other SDCs.

Medium Term: It is anticipated that there will be an uptake in LZEVs 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. It is anticipated that road traffic levels will grow at a low rate relative to other SDC and this may make protecting the water environment easier to achieve. Effects are anticipated to be slight beneficial.

Long Term: It is anticipated that trends in increased LZEV use would continue, along with smart mobility and digital connectivity, with resulting protection of the water environment. The use of SuDS on new / upgraded transport interventions would also have increased in scale (as per WFD). This SDC has forecasted medium growth in traffic levels relative to other SDC, and this could make protecting the water environment more difficult to achieve. Effects are anticipated to be slight beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: There are a range of agricultural land classifications across SDC 2, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a), with extensive areas of Grade 1 to the north of Liverpool. It is also worth noting that in this SDC are located the large urban conurbations of Manchester and Liverpool, as well as the associated large towns. Within this SDC approximate percentages of agricultural grade land are 4.85% Grade 1 (high risk relative to other SDCs), 9.46% Grade 2 (medium risk relative to other SDCs), 41.36% Grade 3 (high risk relative to other SDCs), 4.86% Grade 4 (low risk relative to other SDCs), and 1.96% Grade 5 (low risk relative to other SDCs), while 27.69% is classed as Urban or Non-Agricultural (high risk relative to other SDCs). Within this SDC there are seven EA Special Sites identified, which are known to be contaminated. There are 82 Authorised Landfill sites (0.45% of the SDC) and 1308 Historic Landfill sites (1.96% of the SDC). SDC 2 is considered at **high risk** relative to other SDCs in terms of high value agricultural land and known contamination. While there is low traffic relative to other SDC and low growth, the high risk means effects are anticipated as slight adverse.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. The medium growth in road use in the long term means effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of those areas of higher grade soil should always be considered (55.67% of this SDC).

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Low	+	+	-	+

Commentary

Short Term: Protected sites represent a total of about 1.7% of the SDC area (64.8km^2) and include the World Heritage Site of Liverpool Maritime Mercantile City, 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 STP aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features, e.g. historic railway stations. SDC 2 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. However, there is low road use and low growth relative to other SDCs. 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. Effects are anticipated to be slight beneficial.

Long Term: 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 relative to other SDCs.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHS of Liverpool Maritime Mercantile City.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/✗	Local	ST-LT	Perm	High	+	+	+/-	+

Commentary

Short Term: There are no National Parks or AONBs within the SDC 2 area. SDC 2 is thus considered to be at **low risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 2 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, etc. In some instances, though, there would be potential for enhancement and with low levels of traffic and low growth (relative to other SDCs) this may be easier to achieve.

Medium Term: 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 have reduced adverse effects. There would also be an uptake in vehicles that are quieter and less polluting and with low growth in road traffic making enhancement easier to achieve, this is anticipated to have slight beneficial effects.

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 have reduced adverse effects, though with medium growth in traffic levels (relative to other SDCs) this would be made more difficult to achieve, therefore with a mix of slight adverse and slight beneficial effects anticipated.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9, and note that effective protection of landscape / townscape assets during implementation of interventions under this SDC will be crucial.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Within this SDC it is estimated that total local authority waste collected is 2,090,162 tonnes (0.83tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 56.46% of total SDC LA collected waste is not sent for recycling, which are medium rates relative to other SDCs.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 2 area. Efforts to reach these targets would be considered slight beneficial

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 2 area. Efforts to reach these targets would be considered slight beneficial.

Overall, a mix of **slight beneficial** effects is anticipated in relation to this ISA objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓✓	Reg-Nat	ST-LT	Perm	Med	+	++	++	++

Commentary

Short Term: The full range of transport interventions are proposed under this SDC and that would include some such as rail improvements and LZEV facilitating which support a lower carbon, affordable transport choice. However, this SDC would also include new highway construction and highway infrastructure improvements. Relative to other SDCs, SDC 2 has low levels of GHG emissions from road sources and medium from rail. This SDC has medium levels of rail use relative to other SDC. SDC 2 is thus considered to be **lower priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV use are anticipated. By 2035, carbon emissions from road should show a reduction, while rail should show a very low growth (though with a downward trend relative to the short term). These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid. This SDC has low levels of rail growth (relative to other SDCs) but also low levels of road growth (with overall low levels). Effects are anticipated to be moderate beneficial.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though new highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a high fall in carbon emissions from road based transport (though a medium level rise in road use relative to other SDC), with a moderate fall in rail emissions. Effects are anticipated to be moderate beneficial.

Overall, **moderate beneficial** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 2. A number of inferences are also made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Derived from assessment of major intersecting Local Enterprise Partnerships, it is found that SDC 2 attributes a below average GVA at approximately £104billion. Income deprivation is averaged at 29.70%, above an SDC average of 27.05%. Also of note those receiving job seekers allowance is averaged at 1.33%, below an SDC average of 1.68%.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 2 will benefit to a moderate extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 2 area will increase by an additional £33.7bn and there will be an additional 260k jobs. This represents a moderate beneficial effect relative to other SDCs

Overall, **moderate beneficial** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	++	+++	+++	+++

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. Full beneficial effects, though, may not be experienced in the short term. There are 19 Local Authorities in this SDC, which is the lowest number relative to the other SDCs. This area is also the lowest by area of any of the SDCs by a considerable margin. As such it may be easier to coordinate over this lower number of authorities and smaller area relative to other SDCs.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The low relative size of the SDC and lower number of authorities may make coordination easier. This is anticipated to result in large beneficial effects.

Long Term: It is anticipated that the introduction of a new Strategic approach will result in more effective delivery of major infrastructure. The low relative size of the SDC and low number of authorities may make coordination easier. This is anticipated to result in large beneficial effects.

Overall, **large beneficial** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen connectivity between important and densely populated economic centres and assets, including some of the North's largest cities such as Manchester and Liverpool. Supporting connections between Manchester, Liverpool and Cheshire could increase the range of people who have access to jobs and community centres, faith centres, health and social clubs. This would be particularly beneficial to those communities who currently do not have good access to jobs. However, it is equally important to consider the impact of road enhancements and whether they may have negative effects on communities such as severance or air pollution. Greater Manchester has the highest proportions of black and minority ethnic populations across the North. Furthermore, Greater Manchester and Liverpool City region LEPs have the highest percentage of people in the most deprived areas in the North. Liverpool City Region also has the highest percentage of DLA claimants within the North.

Medium Term: As the infrastructure develops, connecting a greater number of areas within Liverpool, Greater Manchester and Cheshire and Warrington may become stronger and offer a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased. However, there may be some negative effects if road enhancements increase traffic in certain areas.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. Also consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, so that any localised mitigation measures such as improved pedestrian crossings to reduce severance can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Strengthening the connectivity between Liverpool, Greater Manchester and Cheshire and Warrington, could enable a wider range of people to access a number of services, such as healthcare. It is also important to consider any health effects through road enhancements that increasing numbers of vehicles and HGVs have on communities such as increased air and noise pollution. Residents in Liverpool City Region have the highest proportion of people in bad and very bad health compared to other areas in the North. Greater Manchester is in line with the average across the North. Liverpool City Region and Greater Manchester have life expectancies slightly below that of the Northern Region average, however, Cheshire and Warrington have slightly higher life expectancies.

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. Any impacts of increased traffic and HGV traffic can have negative health impacts on communities over the medium term such as increased air and noise pollution.

Long Term: As with the medium term, there will be the potential benefits and negative effects of widening the number of services accessible to people and possibly increasing traffic on roads.

Overall, a **mix of slight beneficial and slight adverse** effects is anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air quality levels as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Redevelopment and improved integration of stations have the potential to improve the perception of community safety and reduce the fear of crime.

Greater Manchester and Liverpool City Region have some of the higher levels of crime within the Northern Region. The levels are above that for both the Northern Region and England. Whereas Cheshire and Warrington has one of the lowest crime levels in the Northern Region.

Medium Term: It is anticipated that more upgrades to stations and other user facilities, creating a modern travelling environment, would improve perceived community safety.

Long Term: As with the medium term, more enhancements are likely to reduce perceived levels of fear of crime.

Overall, **slight beneficial** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. When improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between important and densely populated centres could support job opportunities This could include, those in deprived areas, people with disabilities and older people.

Medium Term: Infrastructure to connect the major cities, could improve employment within the areas. Liverpool City region and Greater Manchester have 2% of people claiming Job Seekers allowance, this is compared to 1% in Cheshire and Warrington.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels if income deprivation, which may also have high levels of health deprivation and disability. Leeds City Region and Greater Manchester have the highest levels of health and disability deprivation in the North, significantly above the average for the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Leeds City Region, 42% of people are in areas with the highest level of income deprivation, Greater Manchester this is 35% and Cheshire and Warrington this is 12%.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas, within Liverpool and Greater Manchester. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	?	Local-Reg	MT-LT	Perm	Med	?	?	?	?

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. The Black and Minority Ethnic population s highest within Greater Manchester, the proportion of Women is in line with that of the North and there is a slightly higher number of DLA claimants in Liverpool City Region and Greater Manchester compared to the North Region average.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which high levels of pedestrians, Children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should take into account the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public rights of way and pedestrian footpaths may have an increase in severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those living in deprived areas.

Medium Term: Any potential effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between major cities and densely populated areas could improve accessibility to jobs and services such as health care. Liverpool City Region has the highest levels of income deprivation in the North, Greater Manchester also has above average levels for the North. Improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those areas with high levels of income deprivation could be beneficial.

Medium Term: Infrastructure to connect the major cities, could improve employment within the areas. Liverpool City region and Greater Manchester have 2% of people claiming Job Seekers allowance, this is compared to 1% in Cheshire and Warrington.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels if income deprivation, which may also have high levels of health deprivation and disability. Leeds City Region and Greater Manchester have the highest levels of health and disability deprivation in the North, significantly above the average for the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Leeds City Region, 42% of people are in areas with the highest level of income deprivation, Greater Manchester this is 35% and Cheshire and Warrington this is 12%.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas, within Liverpool and Greater Manchester. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term benefits.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low levels of income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on its impacts on safety. Reducing the number of cars on the road, especially in urban areas, which high levels of pedestrians, Children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the medium term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could influence perceived levels of severance. For example, severing public rights of way and pedestrian footpaths may have an increase in severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore, people which long term conditions, such as Asthma will be particularly vulnerable to areas increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Greater Manchester has below average killed or seriously injure for the North and Liverpool City region has slightly above average. However, any new links or enhanced road links that may increase the traffic or HGV content has the potential to increase accidents. Although, public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents.

Medium Term: There is the potential effect in the medium-term dependent on the infrastructure implemented. However, this depends on the number of vehicles travelling through specific road corridors and the uptake of public transport.

Long Term: The long term effect is dependent on the specific enhancement to road or public transport corridors.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester and Leeds city region have higher than average crime levels for the North. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety. **Long Term**: There could be improved community safety in the long term with the enhancement of services being developed over a number of years and the uptake taking a while to reach its full potential.
Mitigation / Recommendations **Mitigation Measures:** See Mitigation Table 15. **Recommendations:** No recommendations made.

H.5. SDC 3 Central Pennines

H.5.1. SDC 3 Datasheet

Table H-7 SDC 3 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	64	1.77	0.00253
Designated Sites	SAC	19	4.10	0.02669
	SPA	15	5.58	
	SSSI	208	6.22	
	Ramsar	7	1.91	
	NNR	9	0.39	
	LNR	171	0.42	
	pSPA	1	0.04	
	pSAC	1	0.02	
	WHS	2	0.15	0.00021
	EA Special Areas	6	N/A	-
	AONB	3	6.62	0.01030
	National Parks	2	0.59	
Water	Flood Zones	1620.93km^2	14.12	0.02018
	Flood Risk Areas	527.12	0.02018	0.00656
Landfill	Authorised Landfill Sites	293	0.00656	0.00204
	Historic Landfill sites	3868	1.03	
Agriculture	Agricultural Land Grades	Grade 1: 412.09 km^2	3.59	-
		Grade 2: 2282.94 km^2	19.89	-
		Grade 3: 3928.47 km^2	34.22	-
		Grade 4: 1843.71 km^2	16.06	-
		Grade 5: 10.37 km^2	0.09	-
		Urban: 1604.38 km^2	13.98	-
		Non Agri: 182.70 km^2	1.59	-
Heritage	Listed Buildings	27,887	N/A	-
	Registered Battlefields	4	0.11	0.00158
	Registered Parks and Gardens	144	0.82	

	Scheduled Monuments	1265	0.18	
Ancient Woodland	Ancient Woodlands	1317	N/A	-

H.5.2. SDC 3 Mapping

Figure H-22 SDC 3 - Agricultural Land Classifications

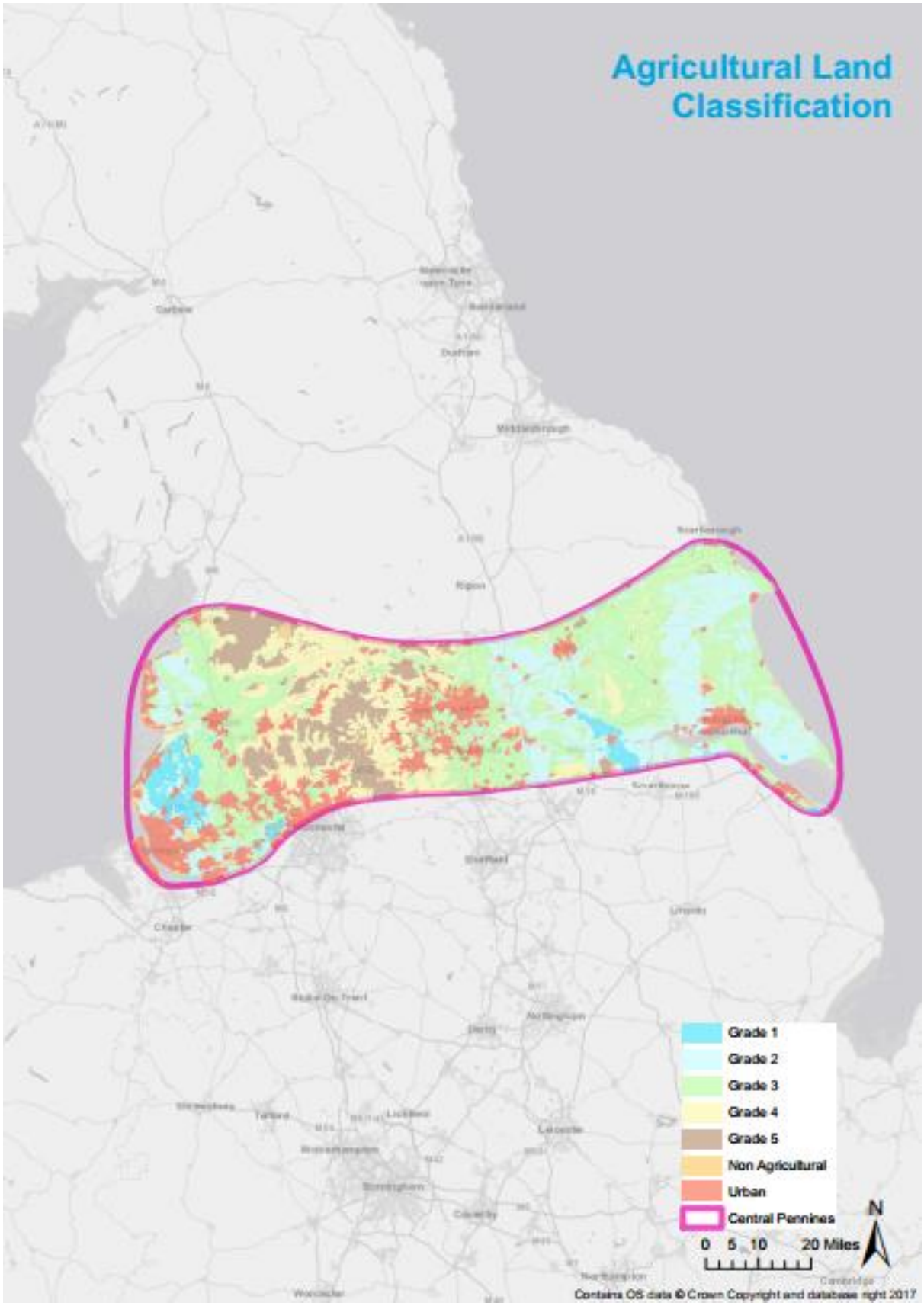


Figure H-23 SDC 3 - Air Quality Management Areas

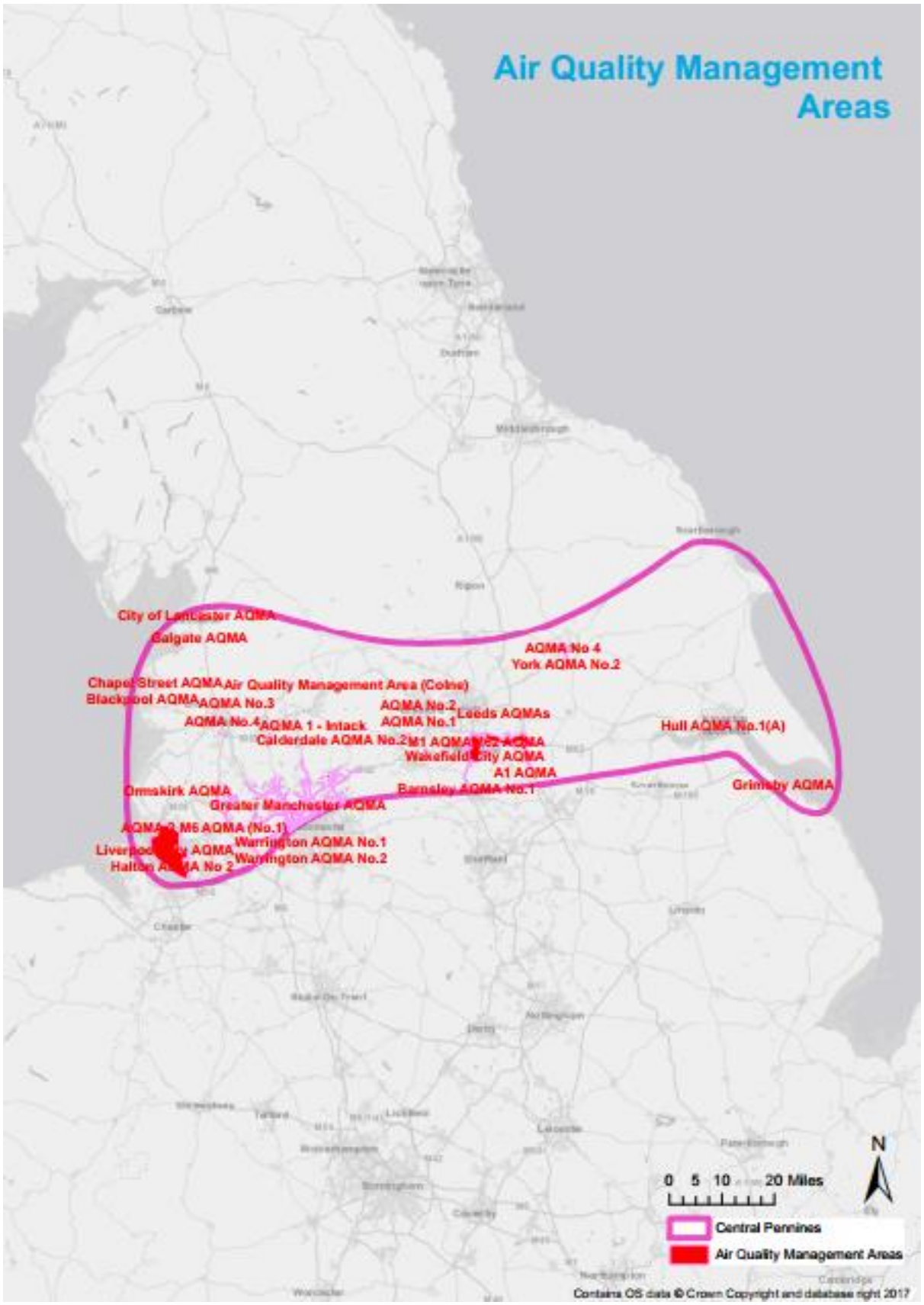


Figure H-24 SDC 3 - Ancient Woodland

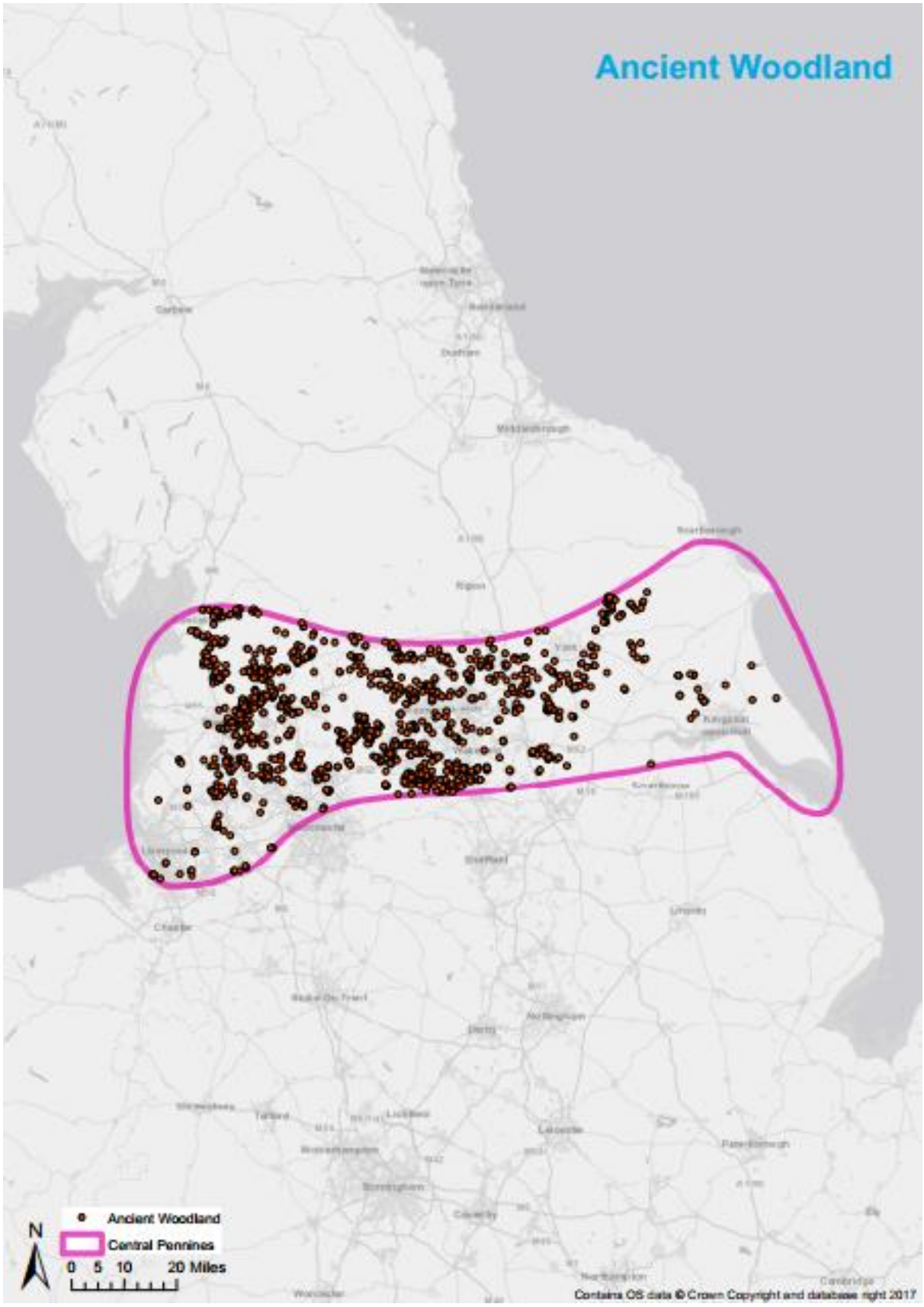


Figure H-25 SDC 3 - Designated Sites

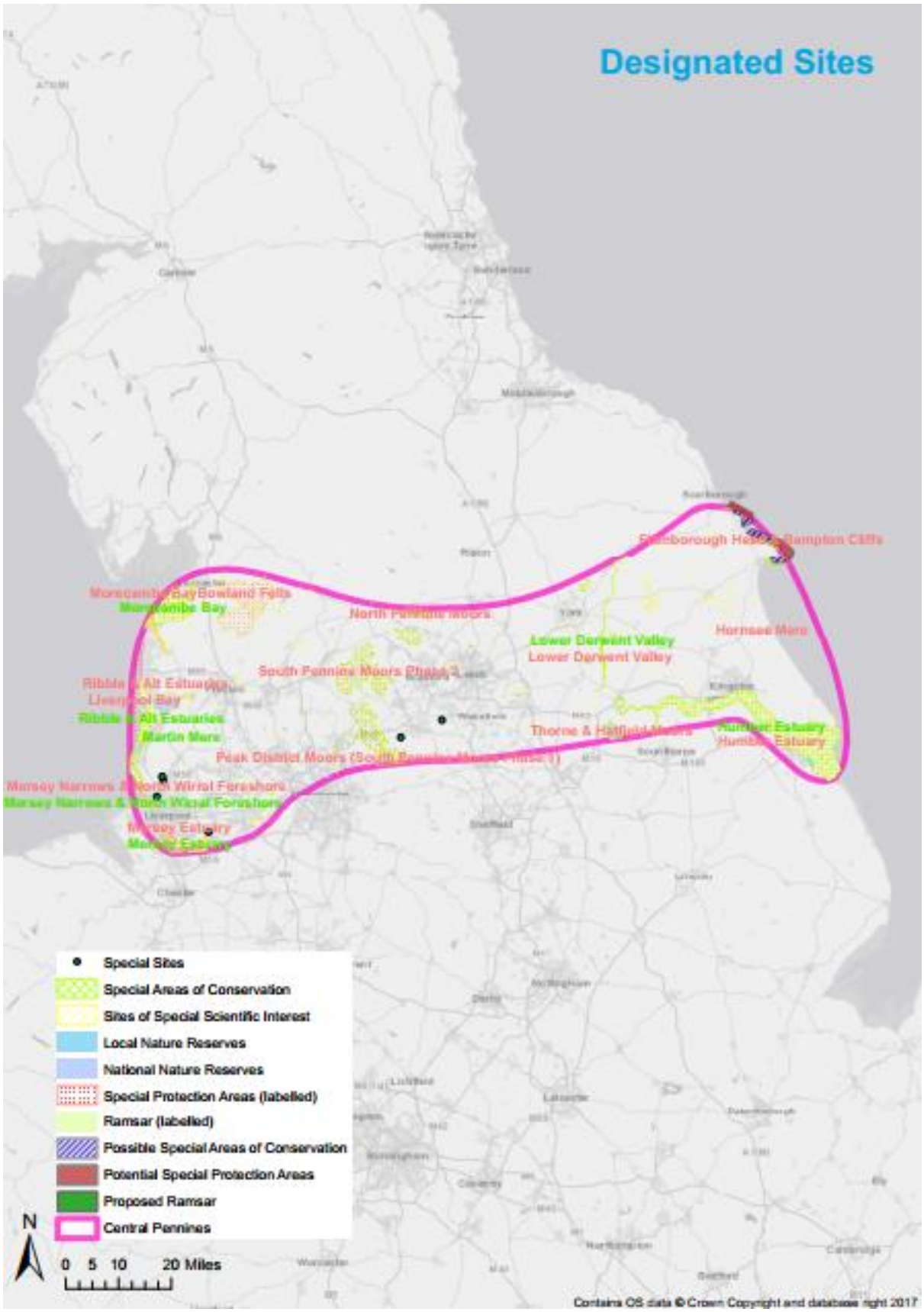


Figure H-26 SDC 3 - Heritage Sites

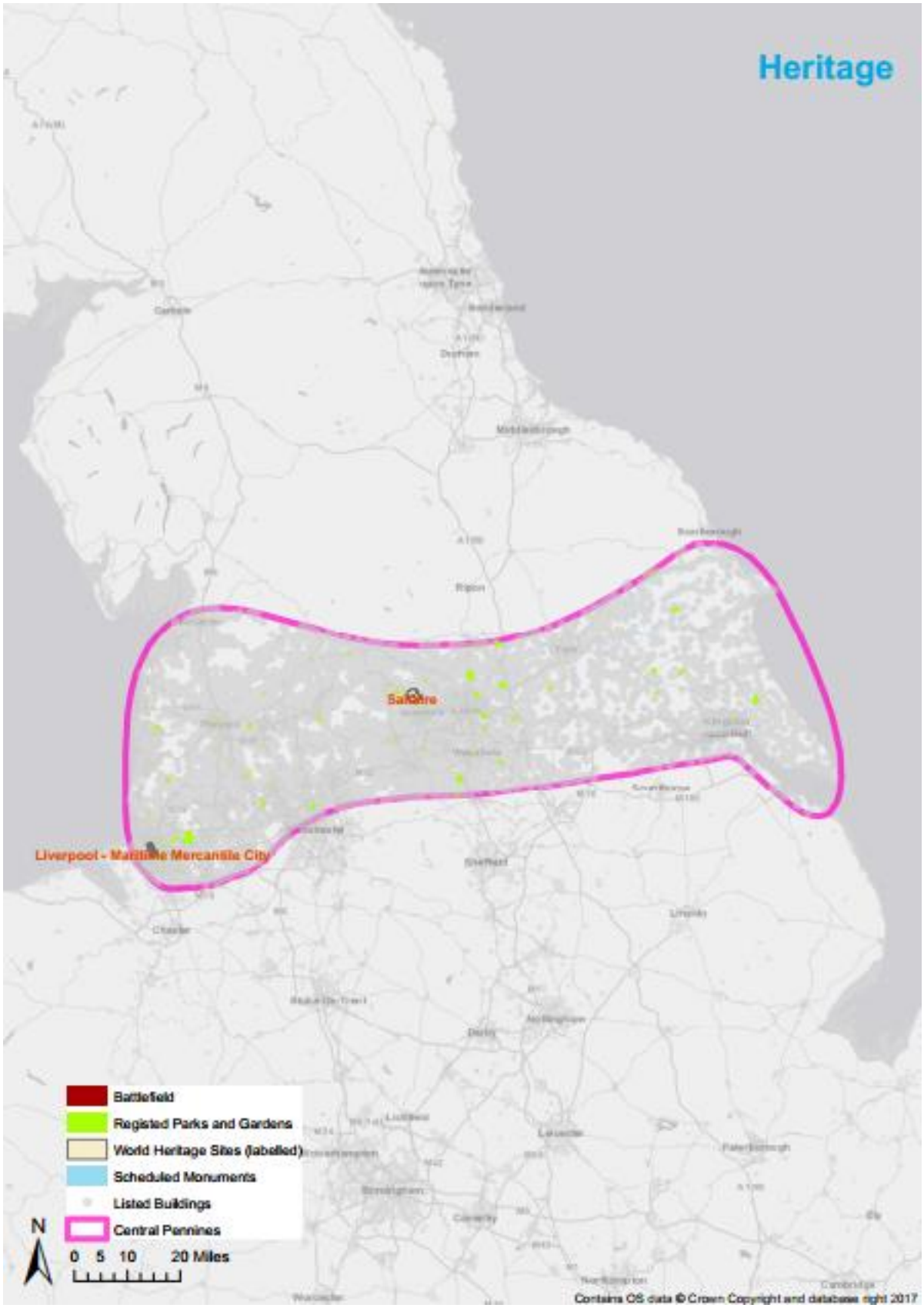


Figure H-27 SDC 3 - Historic and Authorised Landfill Sites

Figure H-28 SDC 3 - Landscape Designations

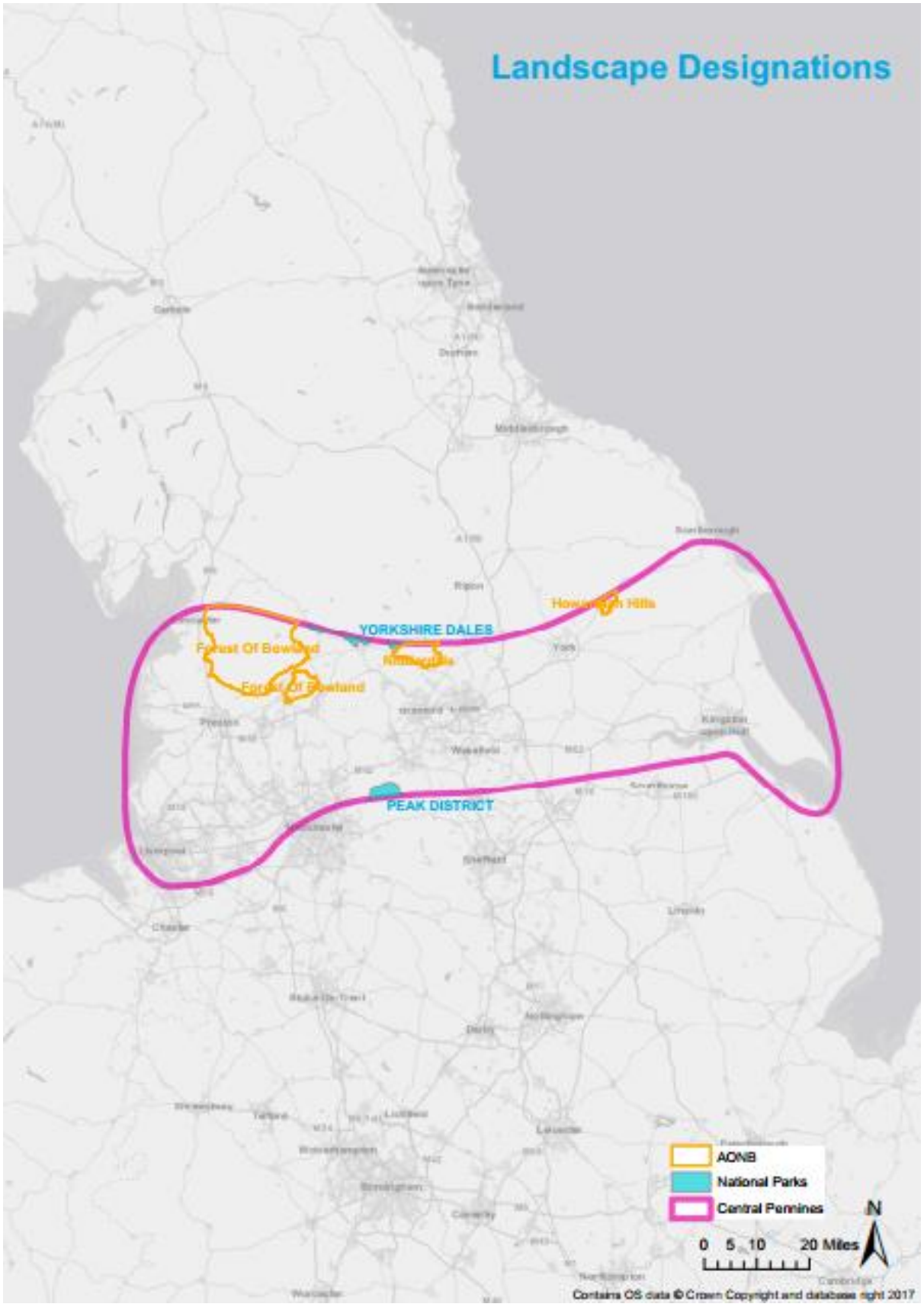
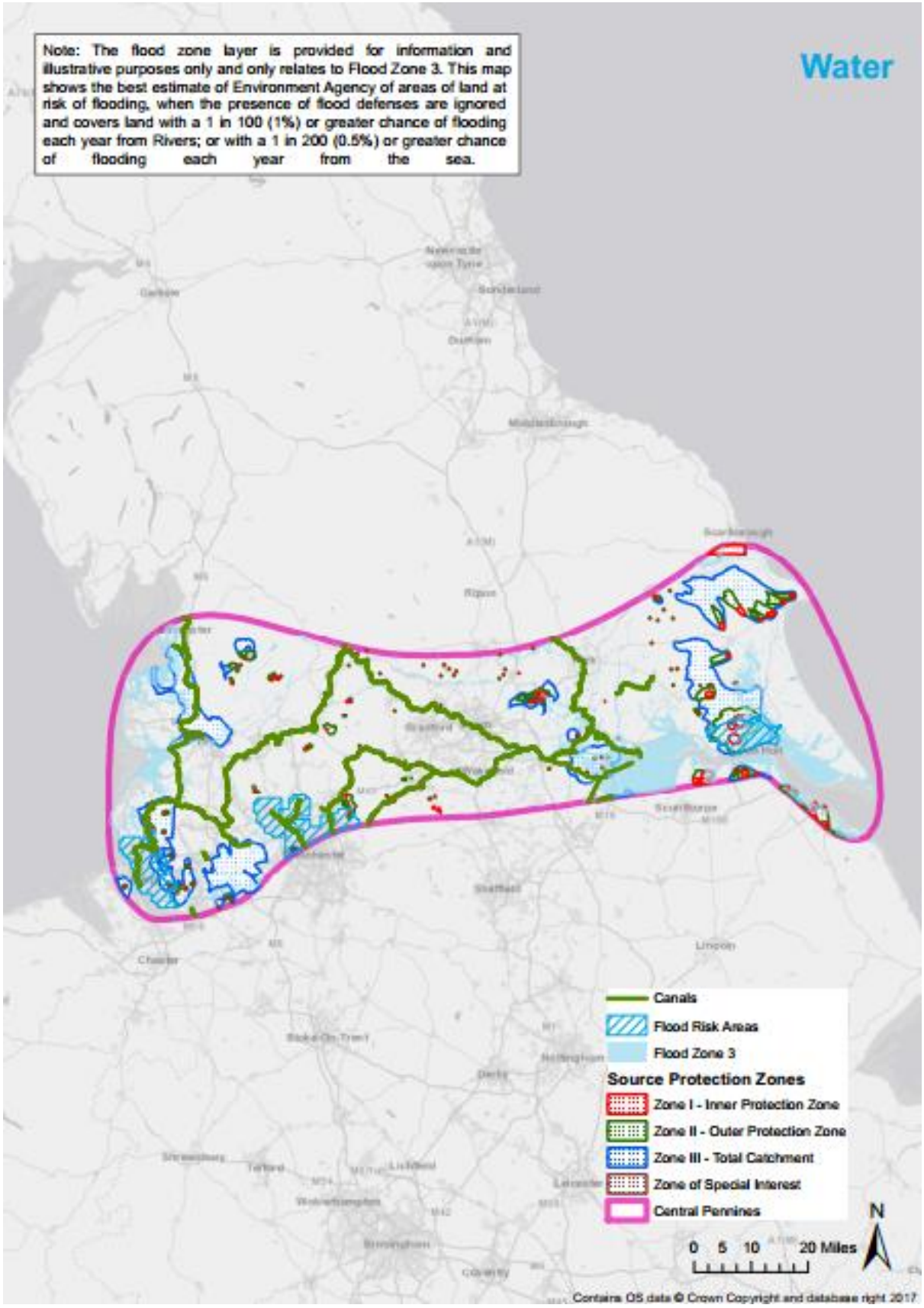


Figure H-29 SDC 3 - Water Features



H.5.3. SDC 3 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 3 - Central Pennines (SDC 3) are as follows:

Assumed Intervention Types
Highways • New highway links • Highway infrastructure improvements **Railways** • New rail links • Rail infrastructure improvements • Station upgrades **Public transport (excl. rail)** • Park and ride schemes • Station and interchange works **Enabling infrastructure** • EV facilitating • Smart/adaptive roads • Digital connectivity

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 3 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

	Trip km	Increase		
	2015	2025	2035	2050
Rail	High	Low	Low	Med
Road	Low	Low	Low	High

CARBON

	CO_2e	Increase (Red) / Decrease (Blue)		
	2015	2025	2035	2050
	High	Low	Low	Low
	Low	Med	Low	High

Table H-8 Assessment of Strategic Development Corridors: SDC 3 – Central Pennines

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓/✗	Reg-Nat	MT-LT	Perm	High	--	-	++	+

Commentary

Short Term: Relative to other SDCs, SDC 3 has low levels of GHG emissions from road sources but high levels from rail. Overall, contributions within SDC 3 are overwhelmingly from road based sources, though rail use is high relative to other SDC. Rail emission levels are growing at a low level and road emissions growing at a medium level over the short term. Effects are anticipated to be moderate adverse.

Medium Term: By 2035, carbon emissions from road will show a low increase, while rail will show low growth, relative to other SDCs. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight adverse.

Long Term: Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions. Road emission decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation, though road use growth will be high. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	-	+/-	+/-	-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. As such there is potential for effects, positive and negative, from the new / upgraded infrastructure, depending upon the nature and location of the intervention. Protected areas account for approximately 2,136km^2 which is 18.62% of the total area of SDC 3. SDC 3 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. Effects are thus anticipated to be slight adverse.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively moderate growth in road movement.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement and medium growth in rail.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include the full range of potential interventions, from which there is potential for effects (positive and negative) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **medium risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively moderate growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, potential effects are currently **uncertain**.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Tables 2 and 3. Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	ST-LT	Perm	High	--	--	+	-

Commentary

Short Term: Within this SDC, the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a high rate in this SDC relative to other SDCs and while it is anticipated to increase, this will be at a low rate compared to other SDCs. Emissions from road travel are anticipated to grow at a medium rate relative to other SDCs. There are 64 AQMAs in this SDC, making up 1.77% of the area and this SDC is at **medium risk** relative to other SDC. The majority of road vehicles are anticipated to be fossil fuelled, although some improvements in emissions are expected from engine efficiency and other measures. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period (road at a medium rate, rail at a low rate, relative to other SDCs). During this period, significant growth in LZEVs is expected, and this should be reflected in a downward trend for overall pollutant emissions from road vehicles, though this would still be at a low level of growth relative to other SDCs. Effects are anticipated to remain medium adverse.

Long Term: While road travel levels are anticipated to have increased at a high rate relative to other SDCs by 2050, it is anticipated that a high proportion of vehicles will be LZEVs. Rail travel will also have grown (at a medium rate relative to other SDCs). Growth in LZEV use means emissions from road are anticipated to decrease at a high rate relative to other SDCs, but the growth in rail emissions, along with the medium risk of this SDC, means that effects on air quality are anticipated to be reduced to slight beneficial.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✓/✗	Local-Reg	MT-LT	Perm	Med	+	+	--	-

Commentary

Short Term: Within this SDC, 1,620km^2 are located within Flood Zone 3, which makes up approximately 14.12% of the area. SDC 3 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience including, for example, SuDS, are being put in place under implemented interventions (including infrastructure upgrades).

Medium Term: Length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure, and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. It is anticipated that road traffic levels will grow at a low rate relative to other SDC and this may make resilience easier to achieve. Effects are anticipated to be slight beneficial.

Long Term: By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure, and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. This SDC has forecasted high growth in road traffic levels relative to other SDC and this could make resilience more difficult to achieve. Effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5. At present 14.12% of the SDC is in flood zone 3 and measures would be required to address in particular these areas.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/✗	Local-Reg	MT-LT	Perm	Med	-	+	--	-

Commentary

Short Term: This SDC is within the North West (39% of the SDC) and Humber (61% of the SDC area) River Basins, with the WFD ensuring there is a good understanding of water management and quality issues in each. For example, in the Humber 16% of the River Basin is significantly impacted by pollution from towns, cities and transport. This SDC has moderate volumes of road based travel relative to other SDCs which may make protecting the water environment more difficult to achieve. Effects are anticipated to be slight adverse.

Medium Term: It is anticipated that there will be an uptake in LZEVs 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. It is anticipated that road traffic levels will grow at a low rate relative to other SDC and this may make protecting the water environment easier to achieve. Effects are anticipated to be slight beneficial.

Long Term: It is anticipated that trends in increased LZEV would increase further, along with smart mobility and digital connectivity, with resulting protection of the water environment. The use of SuDS on new / upgraded transport interventions would also have increased in scale (as per WFD). It is anticipated that road traffic levels will grow at a high rate relative to other SDC and this may make protecting the water environment more difficult to achieve. Effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: There are a range of agricultural land classifications across SDC 3, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a), with extensive areas of Grade 1 to the north of Liverpool and parts of Yorkshire, but also poorer quality in upland areas along the spine of the Pennines. It is also worth noting that in this SDC are located the large urban conurbations of Liverpool, Leeds and Bradford and parts of Greater Manchester. Within this SDC approximate percentages of agricultural grade are 3.59% Grade 1 (high risk relative to other SDCs), 19.89% Grade 2 (high risk relative to other SDCs), 34.22% Grade 3 (high risk relative to other SDCs), 16.06% Grade 4 (high risk relative to other SDCs), and 0.09% Grade 5 (low risk relative to other SDCs), while 15.57% is classed as Urban or Non-Agricultural (high risk relative to other SDCs). Within this SDC there are 12 EA Special Sites identified, which are known to be contaminated. There are 293 Authorised Landfill sites (0.4% of the SDC) and 3,868 Historic Landfill sites (1.03% of the SDC). SDC 3 is considered at **high risk** relative to other SDCs in terms of high value agricultural land and known contamination.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. The large growth in road use in the long term means effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of soil resources, particularly those of higher quality / areas of better agricultural lands, should always be considered, notably those areas of Grade 1 to the north of Liverpool and in Yorkshire.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Low	+/-	+	-	+/-

Commentary

Short Term: Protected sites represent a total of about 1.25% of the SDC area (144km^2) and includes the World Heritage Sites of Liverpool Maritime Mercantile City and Saltaire, which receive 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 STP 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 has moderate levels of road use relative to other SDCs and low growth in this period. It is anticipated this will result in a mix of slight beneficial and slight adverse effects. SDC 3 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs.

Medium Term: Protection of the full range of known sites will continue and it is likely that new sites will join the list. Road growth rates are anticipated to be low relative to other SDCs, and effects are anticipated to be slight beneficial.

Long Term: 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.

Overall, a mix of **slight beneficial and slight adverse** effects is anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHS of Liverpool Maritime Mercantile City and Saltaire. Due to the density of historic assets, particular care needs to be taken in the Central and Western parts of this SDC in relation to the siting of infrastructure.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local-Reg	ST-LT	Perm	High	--	--	--	--

Commentary

Short Term: There are two National Parks and three AONBs within the SDC 3 area. SDC 3 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 3 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, etc. In some instances, though, there would be potential for enhancement. But for the most part effects are anticipated to be moderate adverse due to moderate levels of road use in this SDC.

Medium Term: Areas currently protected for their landscape would still receive that protection, but new interventions would still represent new features in the landscape and there is a medium risk to landscape in this SDC. However, screening would have reduced adverse effects. Effects are anticipated to be medium adverse.

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 have reduced adverse effects, though with medium growth in traffic levels (relative to other SDCs) this would be made more difficult to achieve. Moderate adverse effects are anticipated.

Overall, **moderate adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓/✗	Local-Reg	ST-LT	Perm	Low	-	+/-	+/-	+/-

Commentary

Short Term: Within this SDC, it is estimated that total local authority waste collected is 3,903,770 tonnes (0.49tonnes/capita). As an indication of recycling rates, it is estimated that 58.44% of total SDC LA collected waste is not sent for recycling. This is the least amount of recycling relative to other SDCs and would be considered slight adverse as it may be relatively more difficult to meet this ISA Objective.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 3 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there could still be issues relating to meeting recycling objectives in this SDC. Effects would be a mix of beneficial and adverse.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 3 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there will always be some waste that is not reused and as such there will be a mix of beneficial and adverse effects.

Overall, a mix of **slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓/✗	Reg-Nat	ST-LT	Perm	High	+	--	+	+

Commentary

Short Term: The full range of transport interventions are proposed under this SDC and that would include some such as rail improvements and LZEV facilitating which support a lower carbon, affordable transport choice. However, this SDC would also include new highway construction and highway infrastructure improvements. Relative to other SDCs, SDC 3 has low levels of GHG emissions from road sources and high from rail. SDC 3 has a high level of rail use relative to other SDCs. SDC 3 is thus considered to be at **lower priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV use, are anticipated to result in slight beneficial effects. However, by 2035, carbon emissions from road will still show a low growth, as will rail. These trends are likely despite uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be moderate adverse.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though new highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport (even with a high growth in road use). There is also anticipated to be medium growth in rail use, relative to other SDC. Effects are anticipated to be slight beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 3. A number of inferences are also made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 3 attributes the highest GVA, estimated at £213billion, and well above a derived SDC average of £131billion. Income deprivation is averaged at 27%, just below an SDC derived average of 27.05%. 1.50% of this SDCs population is estimated to receive job seekers allowance, which is below an SDC average of 1.68%.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 1 will benefit to a slight extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 3 area will increase by an additional £38.6bn and there will be an additional 390k jobs. This represents a moderate beneficial effect relative to other SDCs.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓/✗	Local-Reg	ST-LT	Perm	High	-	+	+	+

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. There are 40 local authorities in this SDC and it is the third largest of the SDCs by area. This may make coordination difficult. Full beneficial effects, though, may not be experienced in the short term.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The size of the SDC and number of local authorities (relative to the other SDCs) may make coordination more difficult. Effects are anticipated to be slight beneficial.

Long Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The size of the SDC and number of local authorities (relative to the other SDCs) may make coordination more difficult, as can road infrastructure and there are high relative levels of road use growth anticipated for this SDC. Effects are anticipated to be slight beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen connectivity between important population centres and address the poor east-west connectivity in the North.

Supporting connections between Manchester, Liverpool, Leeds and Hull could increase the range of people who have access to jobs and community centres, faith centres, health and social clubs. This would be particularly beneficial to those communities who currently do not have good access to jobs. However, it is equally important to consider the impact of road enhancements and whether they may have negative effects on communities such as severance or air pollution. Greater Manchester and Leeds City Region have the highest proportions of black and minority ethnic populations across the North (16% and 15% respectively). Furthermore, Greater Manchester and Liverpool City region LEPs have the highest percentage of people in the most deprived areas in the North. Liverpool City Region also has the highest percentage of DLA claimants within the North.

Medium Term: As the infrastructure develops, connecting a greater number of areas within Liverpool, Greater Manchester and Leeds may become stronger and offer a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased. However, there may be some negative effects if road enhancements increase traffic in certain areas.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. Also consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, so that any localised mitigation measures such as improved pedestrian crossings to reduce severance can be suggested. Any impacts, such as increased air quality levels as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Strengthening the connectivity between Liverpool and Greater Manchester could enable a wider range of people to access a number of services, such as healthcare. It is also important to consider any health effects through road enhancements that increasing numbers of vehicles and HGVs have on communities such as increased air and noise pollution. Residents in Liverpool City Region have the highest proportion of people in bad and very bad health compared to other areas in the North. Greater Manchester is in line with the average across the North. Liverpool City Region and Greater Manchester have life expectancies slightly below that of the Northern Region Whereas North Yorkshire has a life expectancy higher than that of the Northern average.

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. Any impacts of increased traffic and HGV traffic can have negative health impacts on communities over the medium term such as increased air and noise pollution.

Long Term: As with the medium term, there would be the potential benefits and negative effects of widening the number of services accessible to people and possibly increasing traffic on roads.

Overall, a **mix of slight adverse and beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air quality levels as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Redevelopment and improved integration of stations have the potential to improve the perception of community safety and reduce the fear of crime.

Greater Manchester and Liverpool City Region have some of the higher levels of crime within the Northern Region. The levels are above that for the Northern Region and England. Whereas Cheshire and Warrington has one of the lowest crime levels in the Northern Region. Leeds City Region has the highest crime rates in the SD 3 corridor. As well as Leeds City Region Greater Manchester, Liverpool City Region and Humber all have above average crime rates for the Northern Region. Whereas North Yorkshire and Lancashire have below average crime rates compared to the average in the North.

Medium Term: It is anticipated that more upgrades to stations and other user facilities, creating a modern travelling environment, would improve perceived community safety.

Long Term: As with the medium term, more enhancements are likely to reduce perceived level of fear of crime.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. When improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is important to consider the areas when looking at improving interchanges, areas with the highest crime deprivation would benefit most from increased perception of community safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between important and densely populated centres could support job opportunities for a wider range of people. This can include those in deprived areas, people with disabilities and older people.

Medium Term: Investing in infrastructure to connect Liverpool, Manchester, Sheffield and Hull could improve employment within the areas. This could therefore, improve accessibility to services and jobs which could help unemployment. This is especially important in areas with high levels of income deprivation such as Liverpool City Region and Greater Manchester.

Long Term: Long term investment in connectivity between North will enhance accessibility over the long term, especially in areas with high levels of income deprivation.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure is unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as healthcare.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. Greater Manchester, has higher than average Black and Minority Ethnic populations, whilst Greater Manchester and Liverpool and Sheffield City Region have higher levels of disability living allowance claimants.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which have high levels of pedestrians, children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should take into account the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public right of ways and pedestrian footpaths may have an increase in perceived severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. There is a higher than average percentage of children in Greater Manchester, Lancashire and Leeds City Region compared to the average across the North.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between major cities and densely populated areas could improve accessibility to jobs and services such as health care. Liverpool City Region has the highest levels of income deprivation in the North, Greater Manchester also has above average levels for the North. Therefore, improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those with high levels of income deprivation could be beneficial.

Medium Term: Infrastructure to connect the major cities, could improve employment within the areas. Liverpool and Sheffield City Region, Greater Manchester and the Humber have 2% of people claiming Job Seekers Allowance, this is compared to 1% in Cheshire and Warrington.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels if income deprivation, which may also have high levels of health deprivation and disability. Liverpool City Region and Greater Manchester have some of the highest levels of health deprivation and disability in the North, significantly above the average for the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure is unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Liverpool City Region, 42% of people are in the quintile with the most income deprivation, for Greater Manchester this is 35%. Humber and Sheffield City Region 28% respectively and Cheshire and Warrington is 14%/

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas, within Liverpool and Greater Manchester. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which have high levels of pedestrians, children and older people who could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public right of ways and pedestrian footpaths may have an increase in severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. 8% of people in Liverpool City region are in bad and very bad health. This is compared to Greater Manchester and Sheffield City Region with 7%, Humber with 6% and Cheshire and Warrington with 5%.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. schools. Furthermore, people which have long term conditions, such as asthma will be particularly vulnerable in areas with increased air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Greater Manchester, Humber and Sheffield City Region have below average killed or seriously injured for the North. Cheshire and Warrington have rates above average for the North. Any new links or enhanced road links that may increase the traffic or HGV content has the potential to increase accidents. Although, public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents.

Medium Term: There is the potential effect in the medium-term dependent on the infrastructure implemented. However, this depends on the number of vehicles travelling through specific road corridors and the uptake of public transport.

Long Term: The long term effect is dependent on the specific enhancement to road or public transport corridors.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester, Humber, Sheffield and Liverpool city region have higher than average crime levels for the North. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety.

Long Term: There could be improved community safety in the long term with the enhancement of services being developed over a number of years and the uptake taking a while to reach its full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

H.6. SDC 4 Southern Pennines

H.6.1. SDC 4 Datasheet

Table H-9 SDC 4 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	57	4.41	0.00512
Designated Sites	SAC	12	8.92	0.03864
	SPA	10	8.99	
	SSSI	168	9.86	
	NNR	7	0.49	
	LNR	196	0.67	
	Ramsar	8	4.30	
	WHS	1	0.05	0.00006
	EA Special Areas	12	N/A	-
	AONB	2	2	0.00987
	National Parks	1	6	
Water	Flood Zones	1620.93km^2	16.80	0.01954
	Flood Risk Areas	750.59 km^2	8.25	0.00960
Landfill	Authorised Landfill Sites	256	0.47	0.00208
	Historic Landfill sites	3188	1.31	
Agriculture	Agricultural Land Grades	Grade 1: 412.67 km^2	4.54%	-
		Grade 2: 1625.40 km^2	17.87%	-
		Grade 3: 2976.99 km^2	32.74%	-
		Grade 4: 953.29 km^2	10.48%	-
		Grade 5: 782.49 km^2	8.60%	-
		Urban: 1669.62 km^2	18.36%	-
		Non Agri: 219.98 km^2	2.42%	-
Heritage	Listed Buildings	20308	N/A	-
	Registered Battlefields	0	N/A	0.00145
	Registered Parks and Gardens	107	1	
	Scheduled Monuments	612	0.15	
Ancient Woodland	Ancient Woodlands	1177	N/A	-

H.6.2. SDC 4 Mapping

Figure H-30 SDC 4 - Agricultural Land Classifications

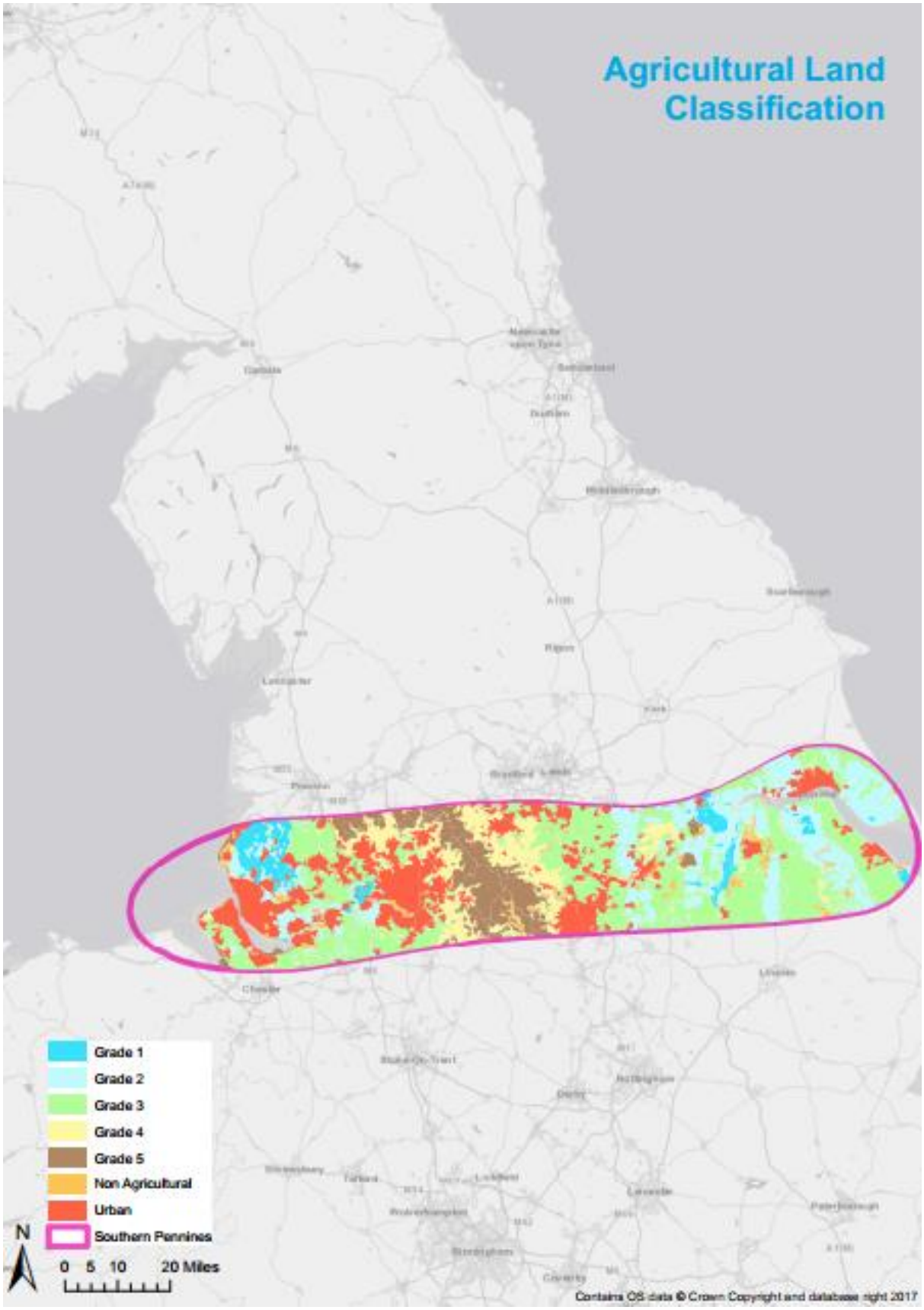


Figure H-31 SDC 4 - Air Quality Management Areas

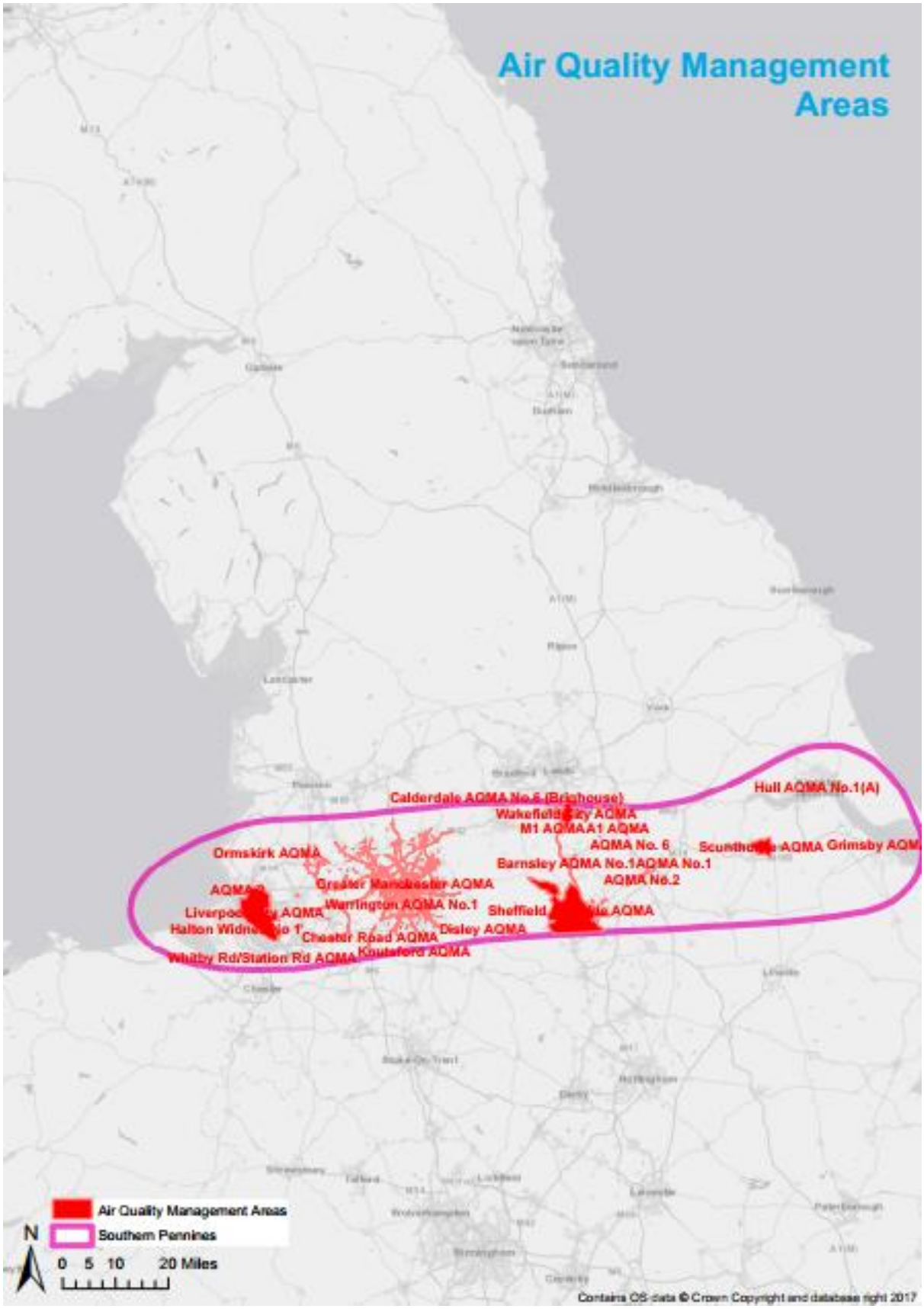


Figure H-32 SDC 4 - Ancient Woodland

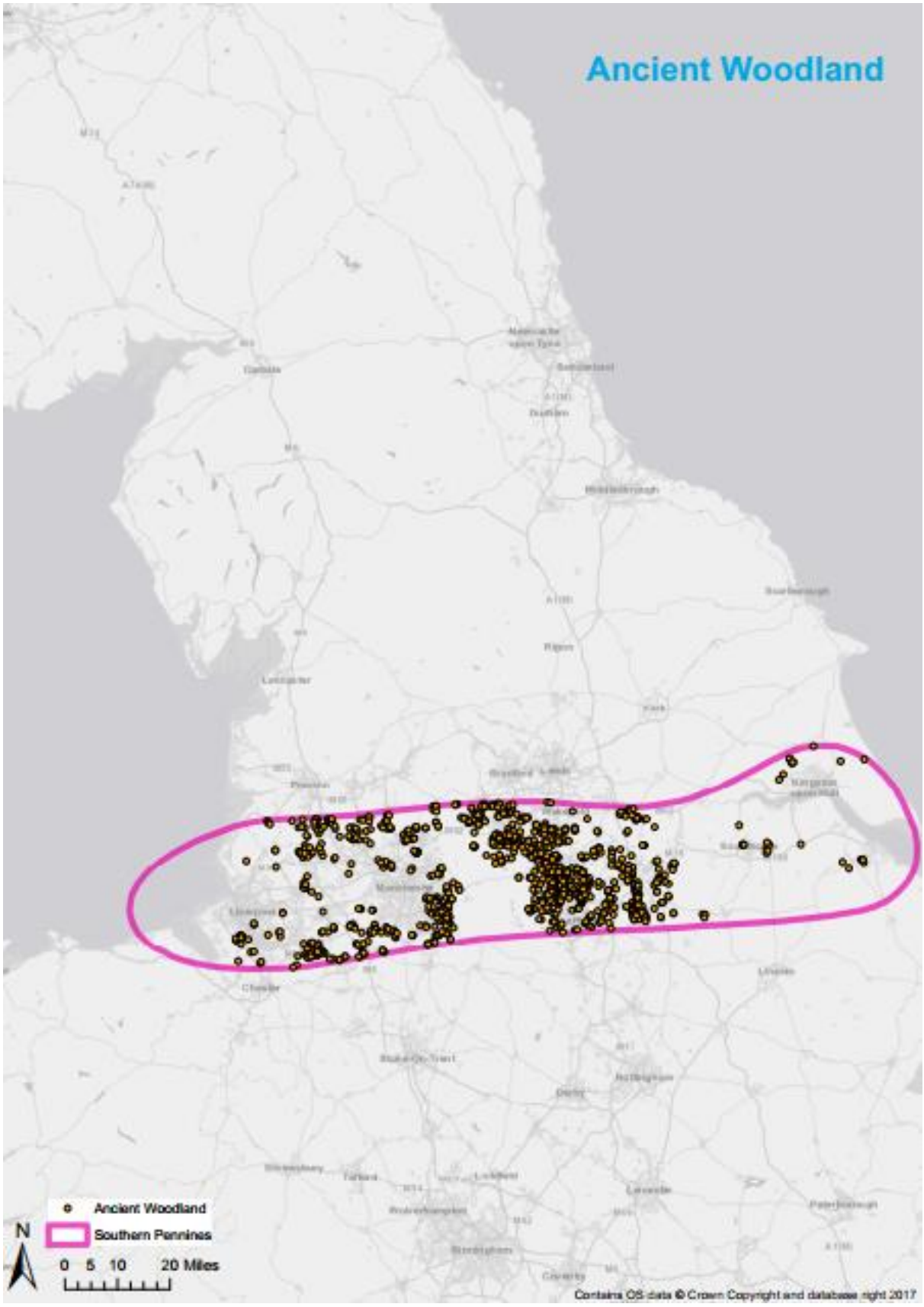


Figure H-33 SDC 4 - Designated Sites

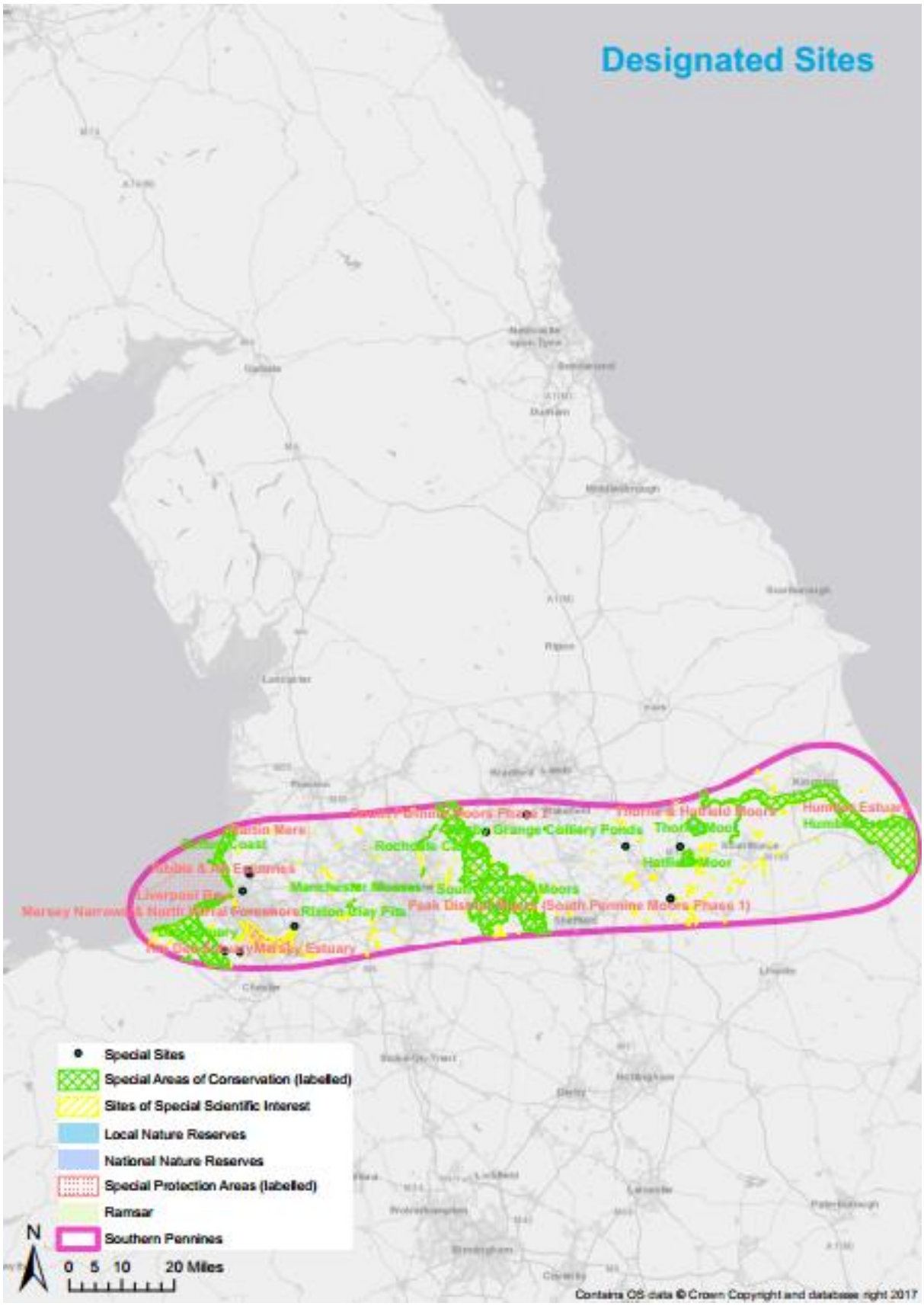


Figure H-34 SDC 4 - Heritage Sites

Figure H-35 SDC 4 - Historic and Authorised Landfill Sites

Figure H-36 SDC 4 - Landscape Designations

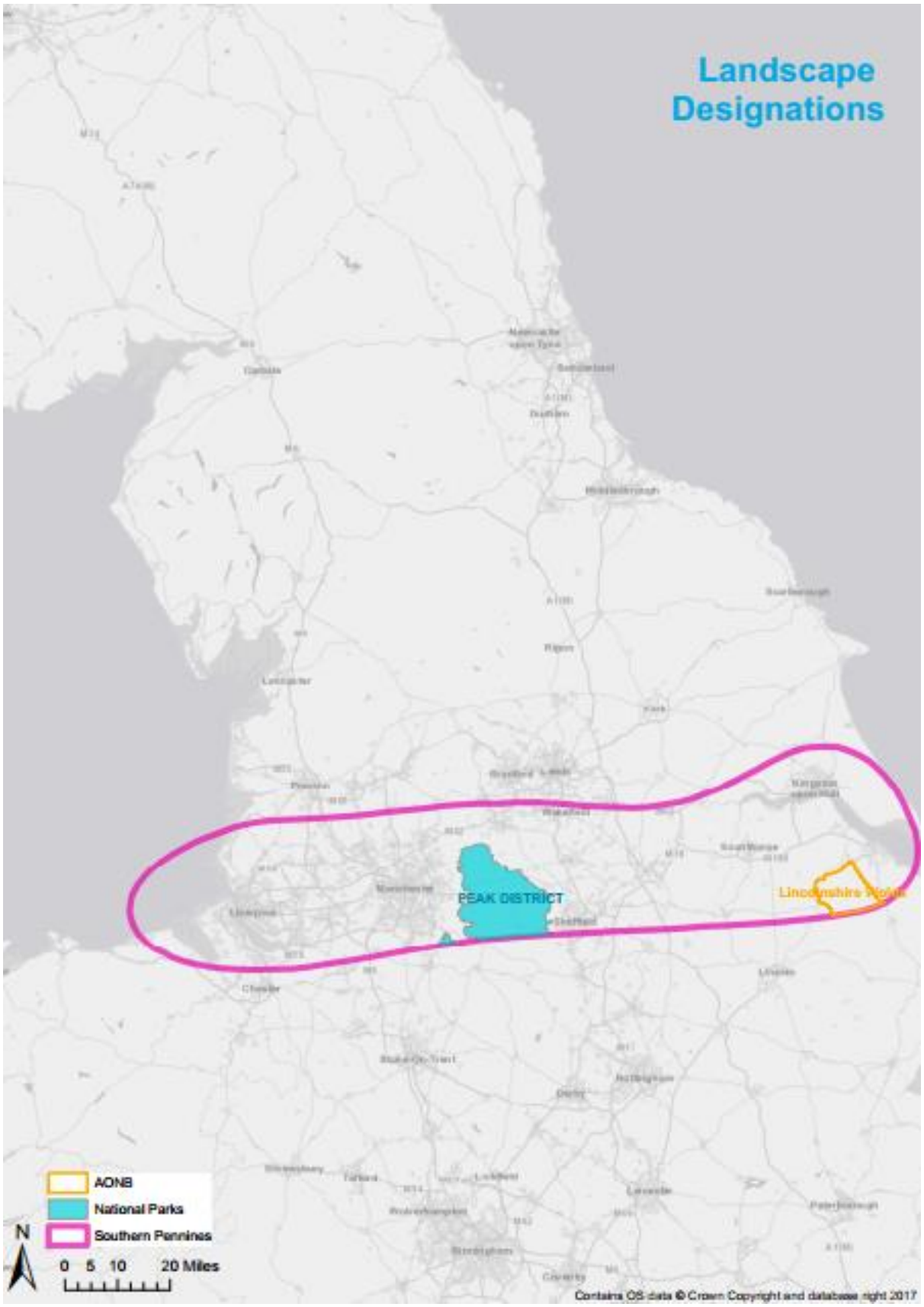
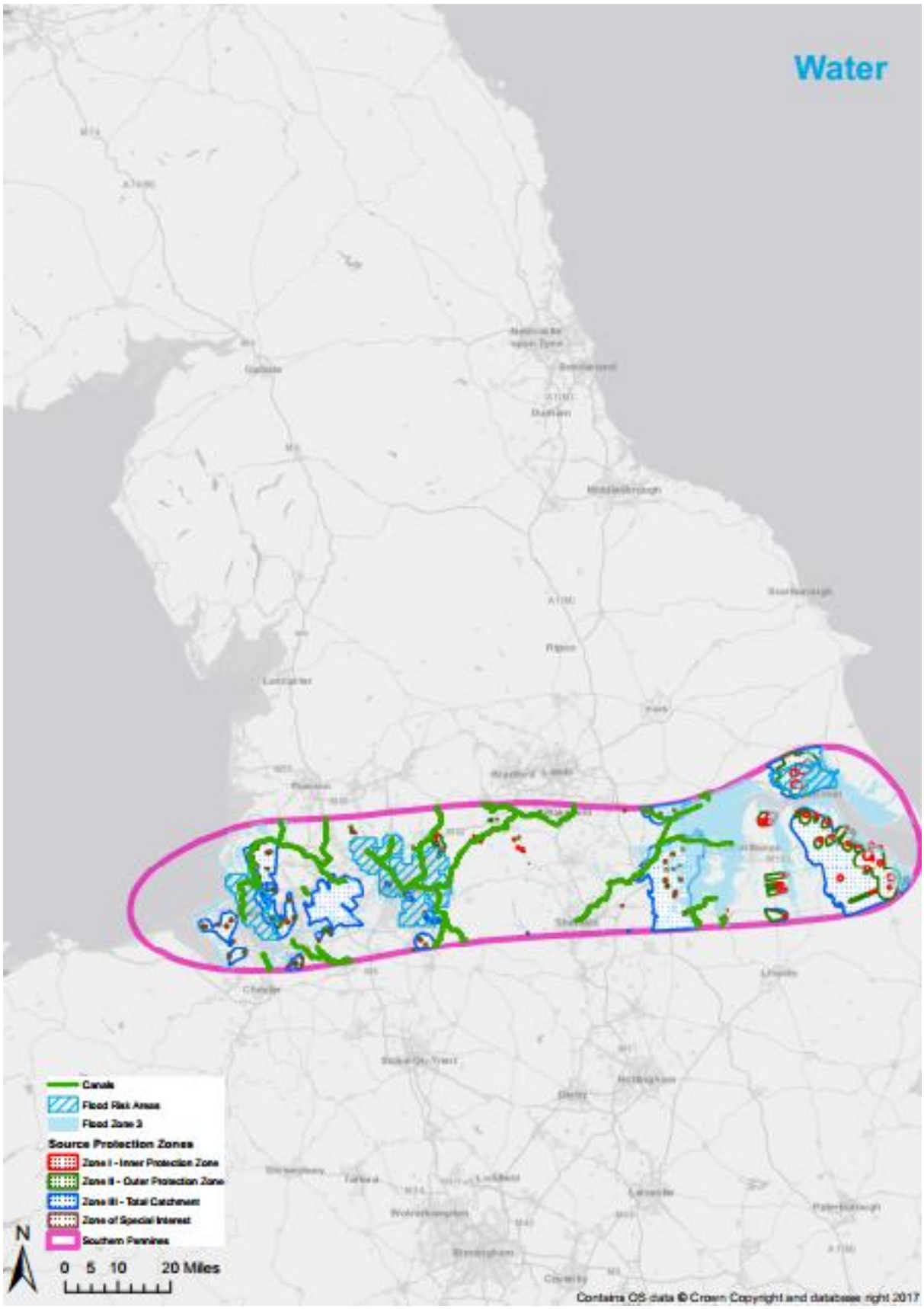


Figure H-37 SDC 4 - Water Features



H.6.3. SDC 4 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 3 - Southern Pennines (SDC 4) are as follows:

Assumed Intervention Types
Highways • New highway links • Highway infrastructure improvements **Railways** • New rail links • Rail infrastructure improvements • Station upgrades **Public transport (excl. rail)** • Park and ride schemes • Station and interchange works **Enabling infrastructure** • EV facilitating • Smart/adaptive roads • Digital connectivity

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 4 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

	Trip km Increase			
	2015	2025	2035	2050
Rail	Low	Low	Low	Med
Road	Low	Low	Low	Med

CARBON

	CO_2e Increase (Red) / Decrease (Blue)			
	2015	2025	2035	2050
	Low	Low	Low	Low
	Low	Med	Low	High

Table H-10 Assessment of Strategic Development Corridors: SDC 4 – Southern Pennines

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓/✗	Reg-Nat	MT-LT	Perm	High	--	+	++	+

Commentary

Short Term: Relative to other SDCs, SDC 4 has low levels of GHG emissions from road sources and low from rail. Overall, contributions within SDC 4 are mainly from road based sources, with rail levels growing at a low rate and road emissions growing at a medium rate over the short term. Effects are anticipated to be moderate adverse.

Medium Term: By 2035, carbon emissions from road will show a slight decline, with rail showing low growth. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight beneficial.

Long Term: Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions. Road emission decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✗	Local	ST-LT	Perm	Low	-	-	-	-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. As such there is a potential for effects (positive and negative) from the new / upgraded infrastructure, depending upon the nature and location of interventions Protected areas account for approximately 2,989km^2 which is about 33% of the total area of SDC 4. SDC 4 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued growth in road movement.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively medium growth in road movement.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be **slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include the full range of potential interventions from which there is potential for effects (positive and negative) from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **high risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and relatively low growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively moderate growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, potential effects are currently **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	LT	Perm	High	--	+	++	+

Commentary

Short Term: Within this SDC, the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a low level in this SDC relative to other SDCs and while it is anticipated to increase, this will be at a low rate compared to other SDCs. There are 57 AQMA in this SDC, covering an area of 4.41% of the SDC and this is considered **high risk** relative to other SDCs. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period (both at a low level relative to other SDCs). During this period, there will also be a strong growth in LZEVs and this is reflected in a downward trend for emissions from road vehicles. Emissions from rail will grow in this period. Effects are anticipated to be slight beneficial.

Long Term: While road travel levels are anticipated to have increased by a medium rate relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEV. Rail travel will also have grown (at a low rate relative to other SDCs) and this, allied to the growth in LZEV, will result in a fall in emissions. Emissions from road are therefore anticipated to decrease at a high rate relative to other SDCs, though rail emissions may increase and this means that effects on air quality are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Within this SDC 1,527km^2 are located within Flood Zone 3, which makes up approximately 16.8% of the area. SDC 4 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience including, for example, SuDS, are being put in place under implemented interventions (including infrastructure upgrades). This area has moderate level of road use relative to other SDC and this may mean resilience is harder to achieve. Effects are anticipated to be slight adverse.

Medium Term: Length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. Road use is anticipated to have relatively low growth but existing moderate levels of road use may make resilience more difficult to achieve. Effects are anticipated to be slight adverse.

Long Term: By the 2050s the length of road and railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, this SDC has forecasted medium levels of road traffic growth and this could make resilience more difficult to achieve. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5. At present 16.8% of the SDC is in Flood Zone 3 and measures would be required to address these areas in particular.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: This SDC is within the North West (39% of the SDC), Humber (60% of the SDC area) and Dee (1% of the SDC area) River Basins, with the WFD ensuring there is a good understanding of water management and quality issues in each. For example, in the Humber 16% of the River Basin is significantly impacted by pollution from towns, cities and transport. This area has medium levels of road use relative to other SDCs and this is predicted to grow at a relatively low rate. This may mean protecting the water environment is more difficult.

Medium Term: It is anticipated that there will be an uptake in LZEVs 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. Road use is anticipated to have relatively low growth but existing moderate levels of road use could make protecting the water environment more difficult. Effects are anticipated to be slight adverse.

Long Term: It is anticipated that trends in increased LZEV would continue, along with smart mobility and digital connectivity, with resulting protection of the water environment. The use of SuDS on new transport interventions would also have increased in scale (as per WFD). However, this SDC has forecasted medium levels of road traffic growth and this could make protecting the water environment more difficult to achieve.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	--	--	--	--

Commentary

Short Term: There are a range of agricultural land classifications across SDC 4, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a), with extensive areas of Grade 1 to the north of Liverpool and parts of Yorkshire, but also poorer quality in upland areas along the spine of the Pennines. It is also worth noting that located in this SDC are the large urban conurbations of Liverpool, Leeds and Bradford and parts of Greater Manchester. Within this SDC approximate percentages of agricultural grade land are 4.54% Grade 1 (high risk relative to other SDC), 17.87% Grade 2 (high risk relative to other SDC), 32.74% Grade 3 (high risk relative to other SDC), 10.48% Grade 4 (medium risk relative to other SDC), and 8.6% Grade 5 (low risk relative to other SDC), while 20.8% is classed as Urban or Non-Agricultural (high risk relative to other SDC). Within this SDC there are 12 EA Special Sites identified, which are known to be contaminated. There are 256 Authorised Landfill sites (0.028% of the SDC area) and 3,216 Historic Landfill sites (1.31% of the SDC). SDC 4 is considered at **high risk** relative to other SDCs in terms of high value agricultural land and known contamination. This SDC has moderate road use relative to other SDC and anticipated low growth which could result in moderate adverse effects in this area of high risk.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. Road use is anticipated to have medium growth and this could lead to moderate adverse effects.

Overall, **moderate adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of soil resources, particularly those of higher quality / areas of better agricultural lands should always be considered – in particular those areas of Grade 1 to the north of Liverpool and in Yorkshire.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Low	+	+	-	+

Commentary

Short Term: Protected sites represent a total of about 1% of the SDC area (117km^2) and include the World Heritage Site of Liverpool Maritime Mercantile City, 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 STP aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features, e.g. historic railway stations. SDC 4 is thus considered to be at **low risk** of negative effects against this ISA Objective, relative to other SDCs. It is anticipated this will result in slight beneficial effects.

Medium Term: Protection of the full range of known sites will continue and it is likely that new sites will join the list. Effects are anticipated to be slight beneficial.

Long Term: 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 road traffic growth.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHS of Liverpool Maritime Mercantile City.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✓/✗	Local	ST-LT	Perm	High	+/-	+	+/-	+/-

Commentary

Short Term: There is one National Park and two AONBs within the SDC 4 area. SDC 4 is thus considered to be at **low** risk of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 4 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 etc. In some instances, though, there would be potential for enhancement and with moderate levels of road traffic and low growth (relative to other SDCs) this may lead to a mix of slight beneficial and slight adverse effects.

Medium Term: 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 have reduced adverse effects.

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 have reduced adverse effects though with medium growth in traffic levels (relative to other SDCs), this would be made more difficult to achieve, with therefore mixed results.

Overall, a **mix of slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9. Effective protection of landscape / townscape assets during implementation of interventions under this SDC will be crucial.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓	Local-Reg	ST-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Within this SDC, it is estimated that total local authority waste collected is 2,710,840 tonnes (0.34tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 55.15% of total SDC LA collected waste is not sent for recycling. This would be considered the best recycling rate relative to other SDCs and may make meeting the requirement of this ISA Objective, relatively easier.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 4 area. Efforts to reach these targets would be considered slight beneficial.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 4 area. Efforts to reach these targets would be considered slight beneficial.

Overall, **slight beneficial** effects are anticipated for in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓/✗	Reg-Nat	ST-LT	Perm	High	-	+	++	+

Commentary

Short Term: The full range of transport interventions are proposed under this SDC and that would include some such as rail improvements and LZEV facilitating which support a lower carbon, affordable transport choice. However, this SDC would also include new highway construction and highway infrastructure improvements. Relative to other SDCs, SDC 4 has moderate levels of GHG emissions from road sources and low from rail. SDC 4 is thus considered to be at **medium priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV use, are anticipated to result in slight beneficial effects. There are low rates of relative growth anticipated for both road and rail. By 2035, carbon emissions from road will show a decline, while rail will show a slight growth. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight beneficial.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though new highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions. There is anticipated to be medium growth (relative to other SDCs) in rail use. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+	+++	+++	+++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 4. A number of inferences are also made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 4 attributes one of the highest GVA at approximately £208billion. Income deprivation is averaged at 28.33%, below an SDC average of 27.05%. It is also estimated that 1.67% of the SDC population is receiving job seekers allowance, just below an SDC average of 1.68%.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 4 will benefit to a slight extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 4 area will increase by an additional £47bn and there will be an additional 470k jobs. This represents a large beneficial effect relative to other SDCs.

Overall, **large beneficial** effects are anticipated for SDC 4 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local-Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. There are 29 Local Authorities in this SDC and this is the second smallest SDC by area. This may make coordination relatively easier in comparison to most other SDCs, though full beneficial effects may not be experienced in the short term.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The relatively small size and low number of authorities may make coordination relatively easier. Moderate beneficial are anticipated.

Long Term: It is anticipated that the introduction of a new Strategic approach will result in more effective delivery of major infrastructure. The relatively small size and low number of authorities may make coordination relatively easier. Moderate beneficial are anticipated.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen connectivity between Liverpool, Manchester, Sheffield and Hull. Supporting connections between Manchester, Liverpool, Sheffield and Hull could increase the range of people who have access to jobs and community centres, faith centres, health and social clubs. This would be particularly beneficial to those communities who currently do not have good access to jobs. However, it is equally important to consider the impact of road enhancements and whether they may have negative effects on communities such as severance or air pollution. Greater Manchester has the highest proportions of black and minority ethnic populations across the North (16%). Furthermore, Greater Manchester and Liverpool City region LEPs have the highest percentage of people in the most deprived areas in the North. Liverpool City Region also has the highest percentage of DLA claimants within the North. In this SDC 41% of people are in highest income deprivation quintile, which is greater than the 28% across the North.
Medium Term: Over time, as the transport infrastructure is enhanced and developed, this will connect a greater number of areas within Liverpool, Greater Manchester and Sheffield, Therefore, these areas may become stronger and offer a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased. However, there may be some negative effects if road enhancements increase traffic in certain areas.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. Also consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, so that any localised mitigation measures such as improved pedestrian crossings to reduce severance can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Strengthening the connectivity between Liverpool, Greater Manchester, Sheffield and Hull could enable a wider range of people to access a number of services, such as healthcare. It is also important to consider any health effects through road enhancements that increasing numbers of vehicles and HGVs have on communities such as increased air and noise pollution. Residents in Liverpool City Region have the highest proportion of people in bad and very bad health compared to other areas in the North. Greater Manchester and Sheffield City Region is in line with the average across the North. Liverpool City Region and Greater Manchester have life expectancies slightly below that of the Northern Region average. However, in Sheffield City Region and Humber life expectancy is line with the average for the North

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. Any impacts of increased traffic and HGV traffic can have negative health impacts on communities over the medium term such as increased air and noise pollution.

Long Term: As with the medium term, there will be the potential benefits and negative effects of widening the number of services accessible to people and possibly increasing traffic on roads.

Overall, a **mix of slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air quality levels as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Redevelopment and improved integration of stations have the potential to improve the perception of community safety and reduce the fear of crime. Greater Manchester has the highest crime rates in the SDC 4 corridor. Sheffield City Region, Liverpool City Region and Humber all have above average crime rates for the Northern Region. Whereas Cheshire and Warrington has below average crime rates for the North.

Medium Term: It is anticipated that more upgrades to stations and other user facilities, creating a modern travelling environment, would improve perceived community safety.

Long Term: As with the medium term, more enhancements are likely to reduce perceived level of fear of crime.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. When improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is important to consider the local areas when looking at improving interchanges. Areas with the highest crime deprivation would benefit most from increased perception of community safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between important and densely populated centres could support job opportunities for a wider range of people. This can include, those in deprived areas, people with disabilities and older people.

Medium Term: Infrastructure to connect Liverpool to the Humber, could improve employment within the areas., therefore, improving accessibility to services and jobs could help unemployment, Especially in areas with high deprivation such as Liverpool City Region and Greater Manchester.

Long Term: Long term investment in connectivity between North will enhance accessibility over the long term, especially in areas with high levels of income deprivation.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure is unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as healthcare.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. Greater Manchester, Lancashire and Leeds City Region have higher than average Black and Minority Ethnic populations, whilst Greater Manchester and Liverpool city Region have higher levels of disability living allowance claimants.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which have high levels of pedestrians, children and older people who could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public right of ways and pedestrian footpaths may have an increase in severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: No recommendations made.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. schools. Furthermore, people which have long term conditions, such as asthma will be particularly vulnerable in areas with increased air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between major cities and densely populated areas could improve accessibility to jobs and services such as health care. Liverpool City Region have the highest levels of income deprivation in the North, Greater Manchester also has above average levels for the North. Whereas Lancashire and Leeds in line with the average income deprivation levels in the North and North Yorkshire is significantly below. Therefore, improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those with high levels of income deprivation could be beneficial.

Medium Term: Infrastructure to connect the major cities, could improve employment within the areas. Liverpool and Leeds City region, Greater Manchester and the Humber have 2% of people claiming Job Seekers Allowance, this is compared to 1% in Lancashire and North Yorkshire.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels if income deprivation, which may also have high levels of health deprivation and disability. Leeds and Liverpool City Region, Lancashire and Greater Manchester have the highest levels of health deprivation and disability in the North, significantly above the average for the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure is unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Liverpool City Region, 42% of people are in areas with the highest level of income deprivation, for Greater Manchester this is 35%. Humber and Lancashire 28% and 25% respectively and North Yorkshire is 7%.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas, within Liverpool and Greater Manchester. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low-income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have on increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent of the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts of safety. Reducing the number of cars on the road, especially in urban areas, which have high levels of pedestrians, children and older people could particularly have beneficial effects. However, increases in traffic and HGV content could have adverse effects, especially for people in deprived areas.

Medium Term: Dependent on the specific measures and infrastructure implemented there could be beneficial or adverse impacts in the long term.

Long Term: As with the medium affects, any affects from the infrastructure and measures introduced could have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Dependent on the specific enhancements to the corridor, whether there is an increase in traffic, HGV content or an increase in the attractiveness of public transport as an option depends on the impacts on severance. Reducing the number of cars on the road, especially in urban areas, or adding additional cycle or pedestrian footpaths to could have positive impacts on severance.

Medium Term: Dependent on the specific elements implemented and where road or public transport enhancements take place could have an effect on severance. For example, severing public right of ways and pedestrian footpaths may have an increase in severance.

Long Term: There could be long term effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓/✗	Local-Reg	MT-LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as Asthma. 8% of people in Liverpool City region are in bad and very bad health. This is compared to Greater Manchester and Lancashire with 7%, Humber with 6% and North Yorkshire with 5%.

Medium Term: Any potential health effects from increased/reduced air and noise pollution can have medium term effects.

Long Term: Any potential health effects from increased/reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When enhancing connectivity is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. school. Furthermore, people which long term conditions, such as Asthma will be particularly vulnerable to areas increases in air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓/✗	Local-Reg	LT	Perm	Med	+/-	+/-	+/-	+/-

Commentary

Short Term: Greater Manchester, Humber and Sheffield City Region have below average killed or seriously injured for the North. Cheshire and Warrington have rates above average for the North. Any new links or enhanced road links that may increase the traffic or HGV content has the potential to increase accidents. Although, public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents.

Medium Term: There is the potential effect in the medium-term dependent on the infrastructure implemented. However, this depends on the number of vehicles travelling through specific road corridors and the uptake of public transport.

Long Term: The long term effect is dependent on the specific enhancement to road or public transport corridors.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester, Humber, Sheffield and Liverpool city region have higher than average crime levels for the North. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety.

Long Term: There could be improved community safety in the long term with the enhancement of services being developed over a number of years, and the uptake taking a while to reach its full potential.

Mitigation / Recommendations
Mitigation Measures: See Mitigation Table 15.
Recommendations: No recommendations made.

H.7. SDC 5 North West to Sheffield City Region

H.7.1. SDC 5 Datasheet

Table H-11 SDC 5 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	48	2.68	0.00475
Designated Sites	SAC	31	9.57	0.06116
	SPA	11	8.41	
	SSSI	331	12.86	
	Ramsar	7	2.71	
	NNR	7	0.57	
	LNR	152	0.39	
	WHS	1	1.15	0.00205
	EA Special Areas	3	N/A	-
	AONB	5	9.77	0.05657
	National Parks	3	22.15	
Water	Flood Zones	901.54 km^2	8.55	0.01516
	Flood Risk Areas	459.5 km^2	4.36	0.00772
Landfill	Authorised Landfill Sites	206	0.23	0.00189
	Historic Landfill sites	946	0.83	
Agriculture	Agricultural Land Grades	Grade 1: 44.20 km^2	0.42%	-
		Grade 2: 486.53 km^2	4.61%	-
		Grade 3: 3259.83 km^2	30.91%	-
		Grade 4: 2372.55 km^2	22.50%	-
		Grade 5: 2665.37 km^2	25.28%	-
		Urban: 1146.55 km^2	10.87%	-
		Non Agri: 274.93 km^2	2.61%	-
Heritage	Listed Buildings	18978	N/A	-
	Registered Battlefields	1	0.03	0.00142
	Registered Parks and Gardens	109	0.57	
	Scheduled Monuments	923	0.20	

Ancient Woodland	Ancient Woodlands	2969	N/A	-

H.7.2. SDC 5 Mapping

Figure H-38 SDC 5 - Agricultural Land Classifications

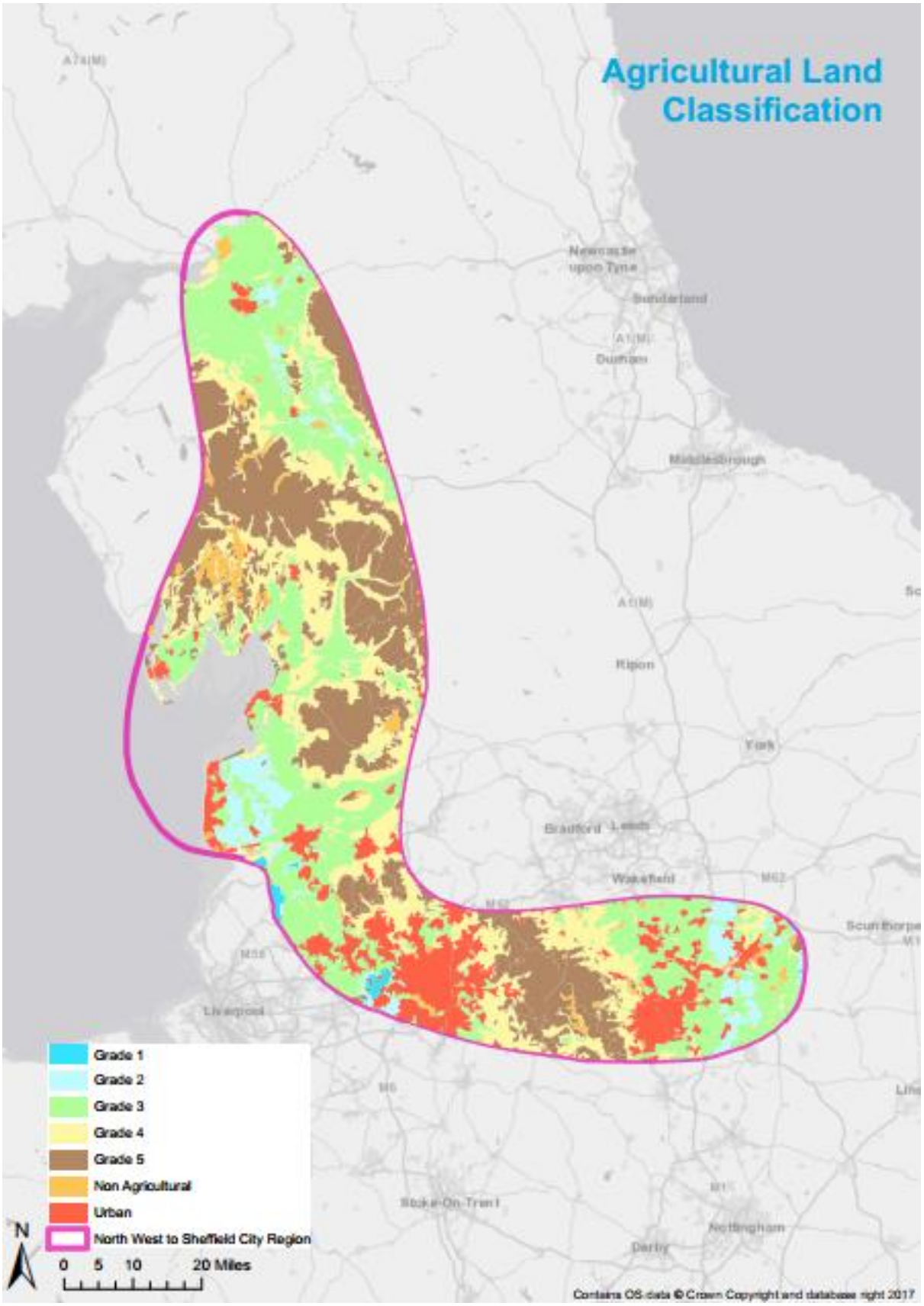


Figure H-39 SDC 5 - Air Quality Management Areas

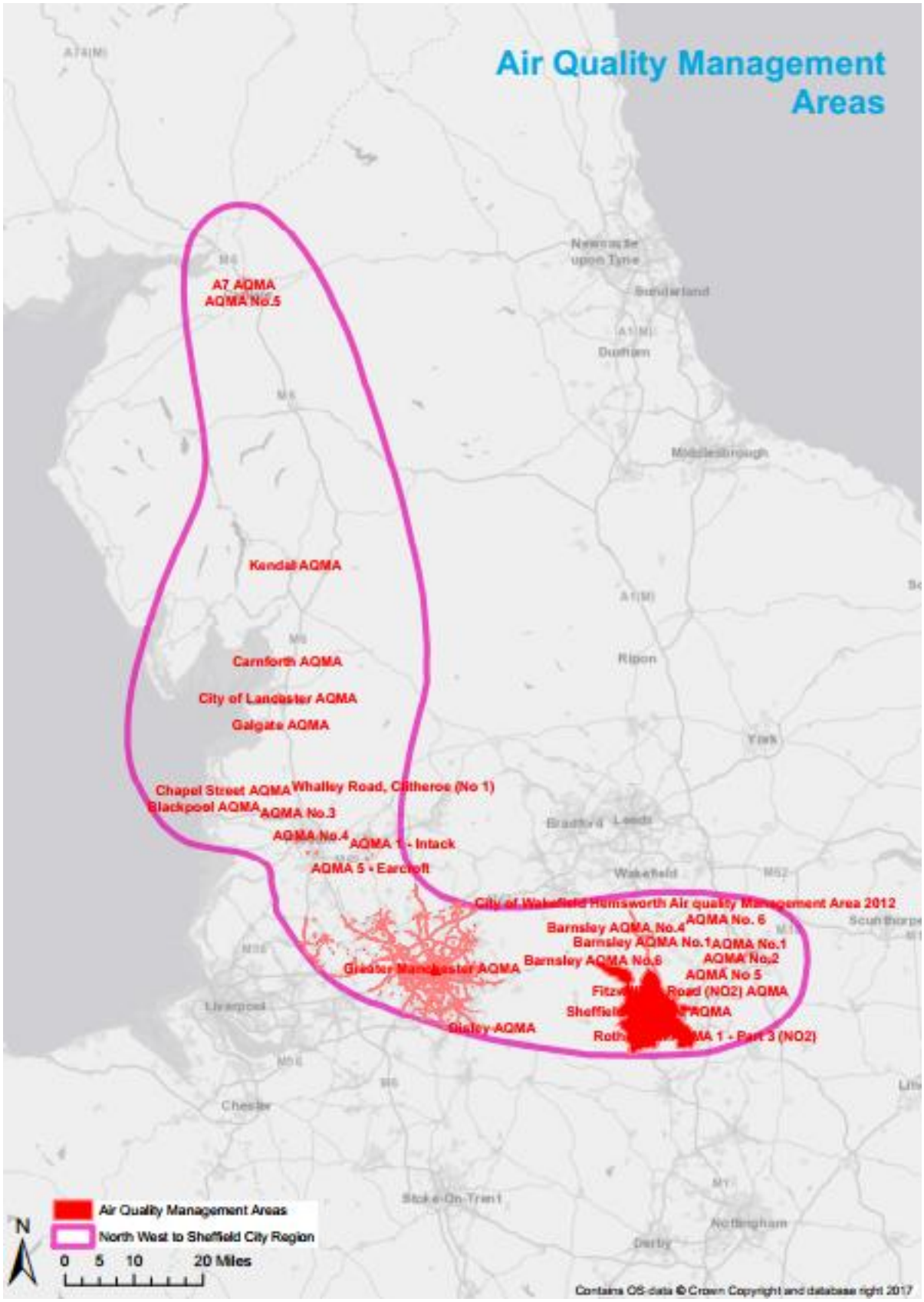


Figure H-40 SDC 5 - Ancient Woodland

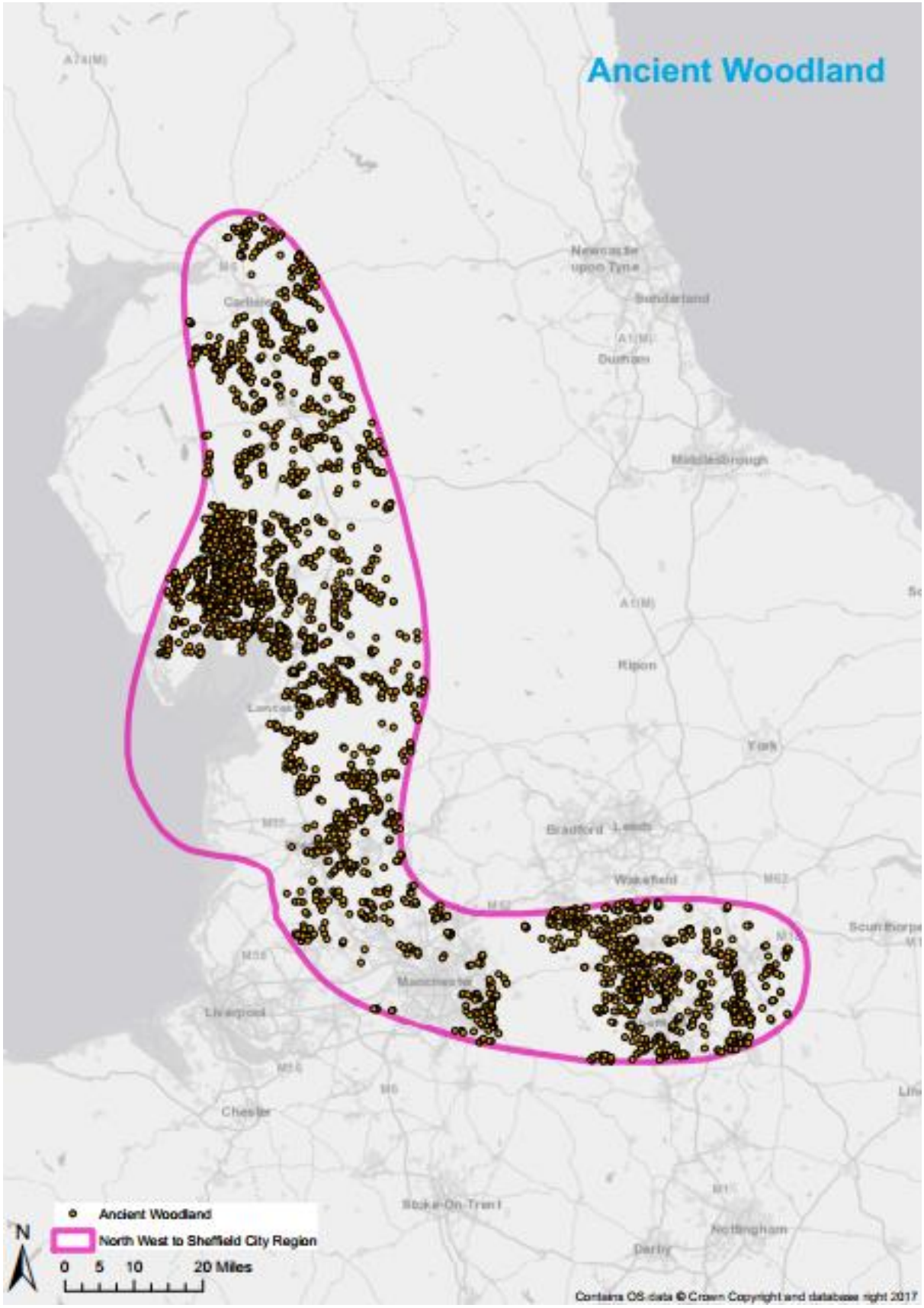


Figure H-41 SDC 5 - Designated Sites

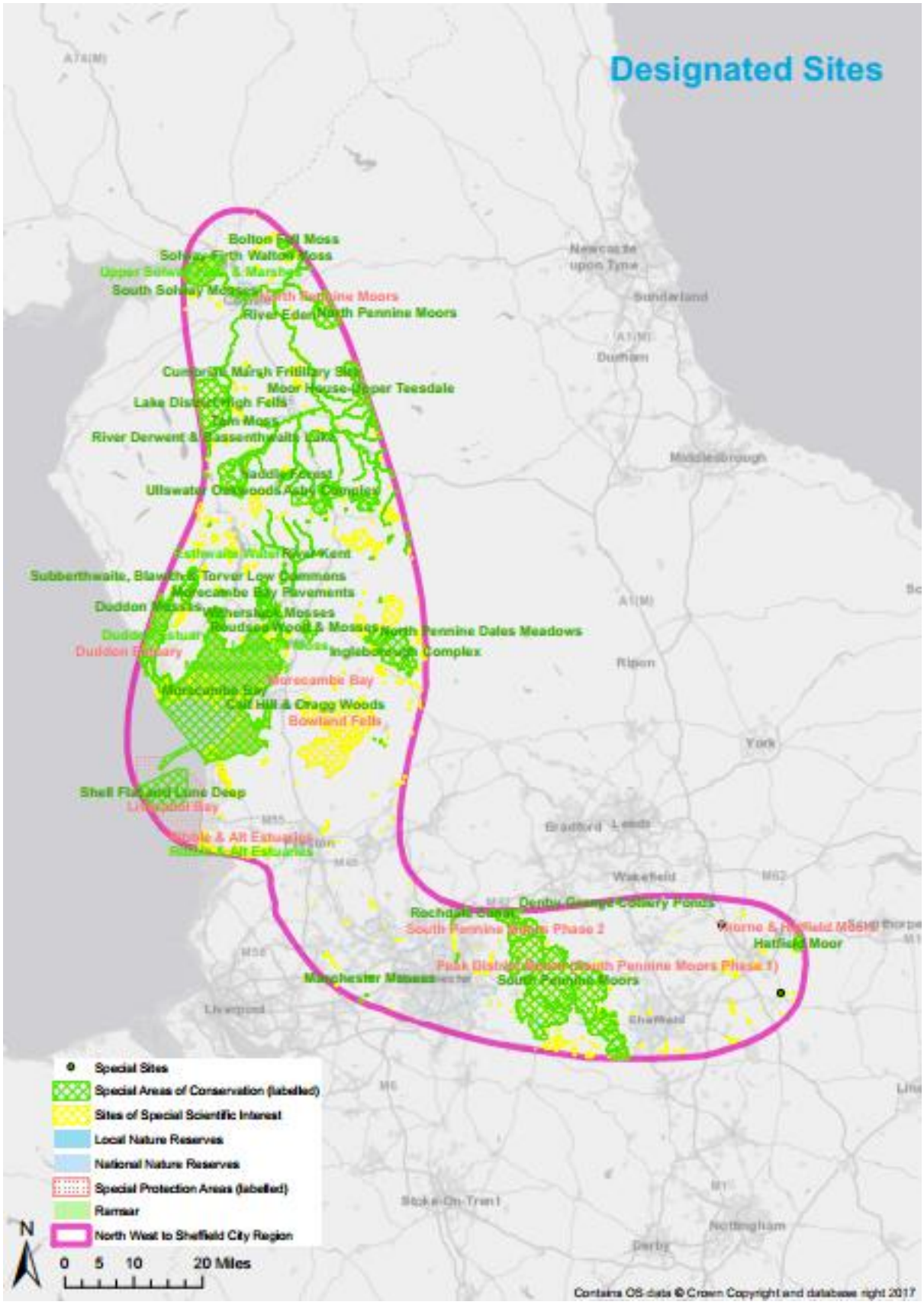


Figure H-42 SDC 5 - Heritage

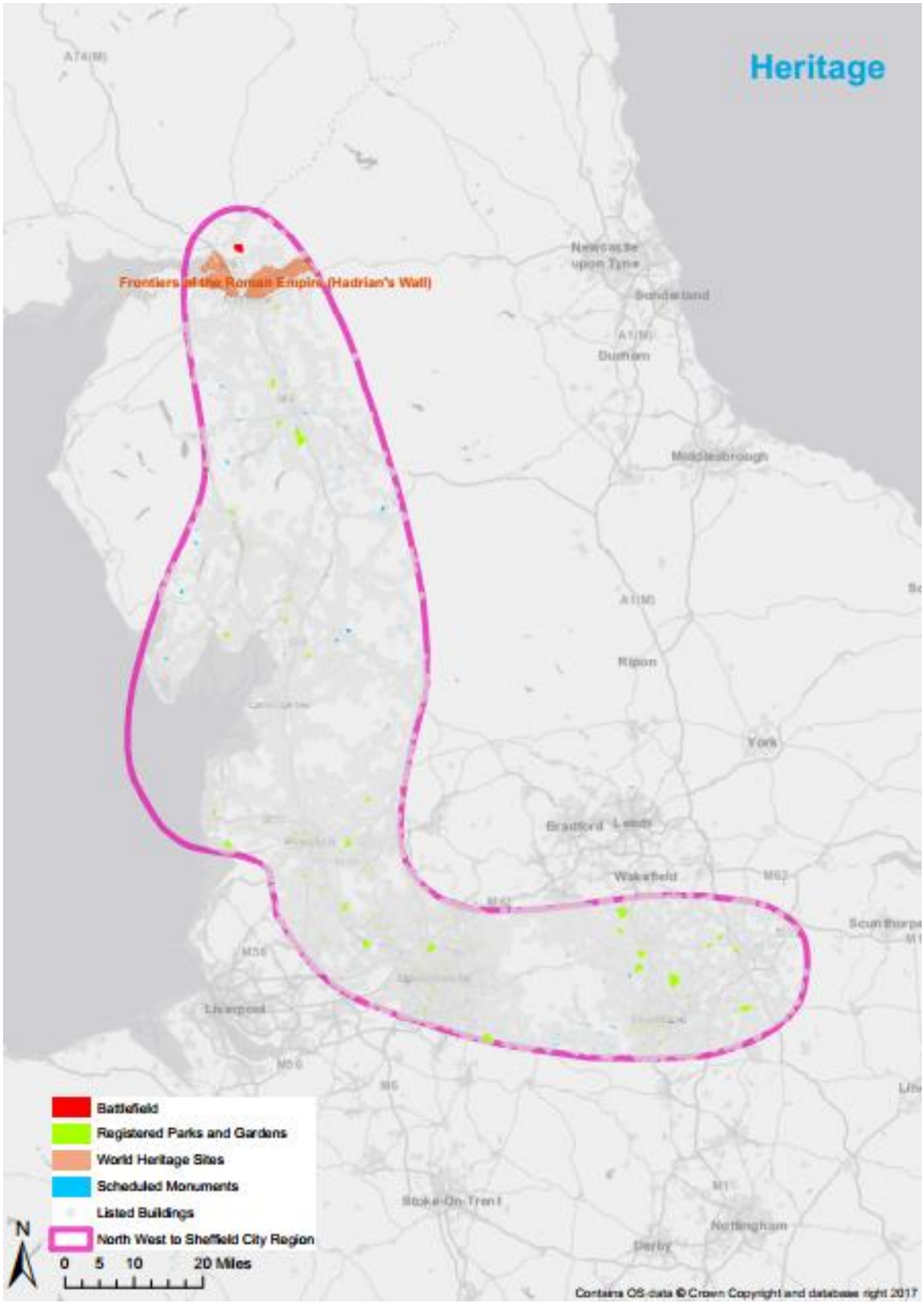


Figure H-43 SDC 5 - Historic and Authorised Landfills

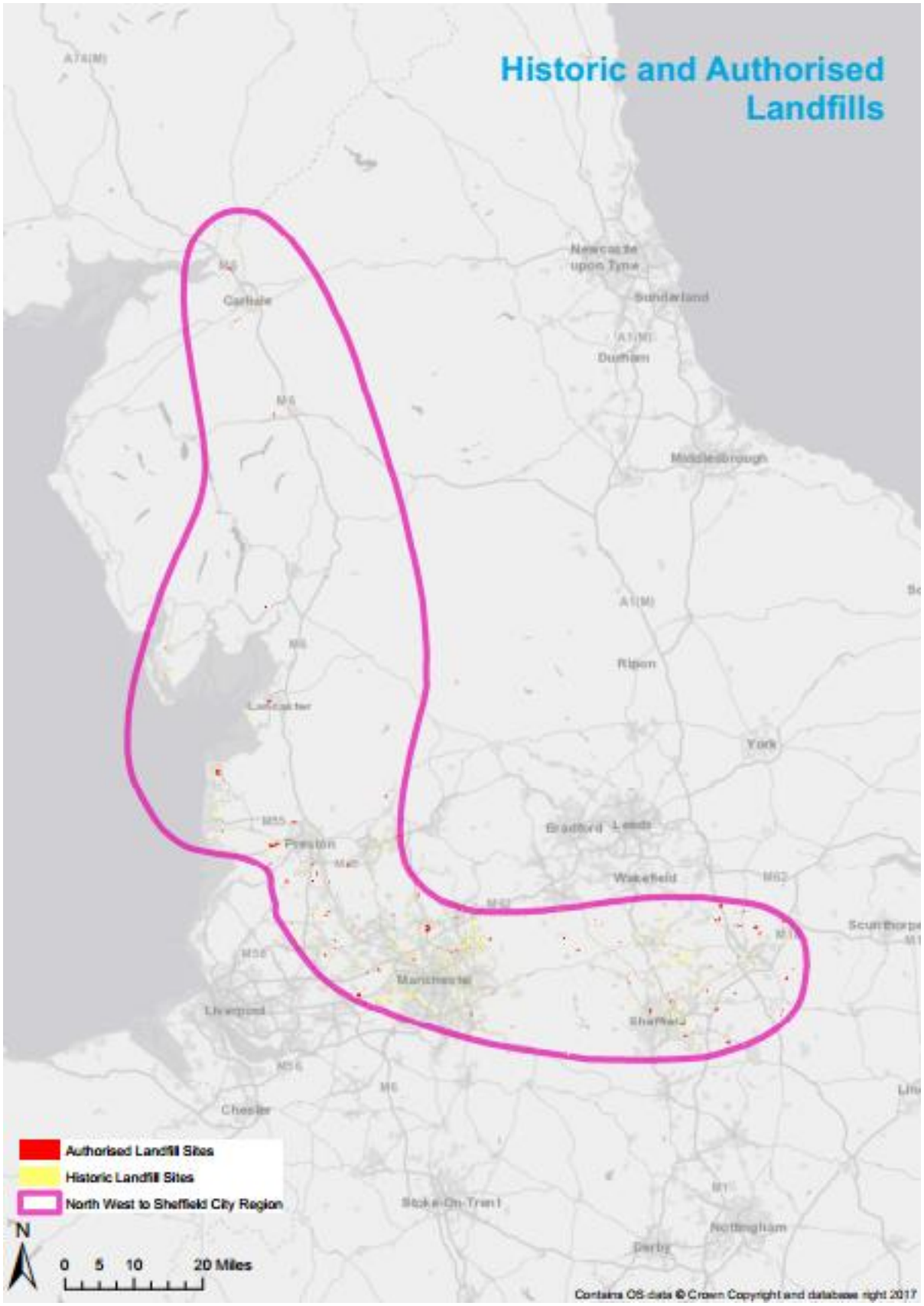


Figure H-44 SDC 5 - Landscape Designations

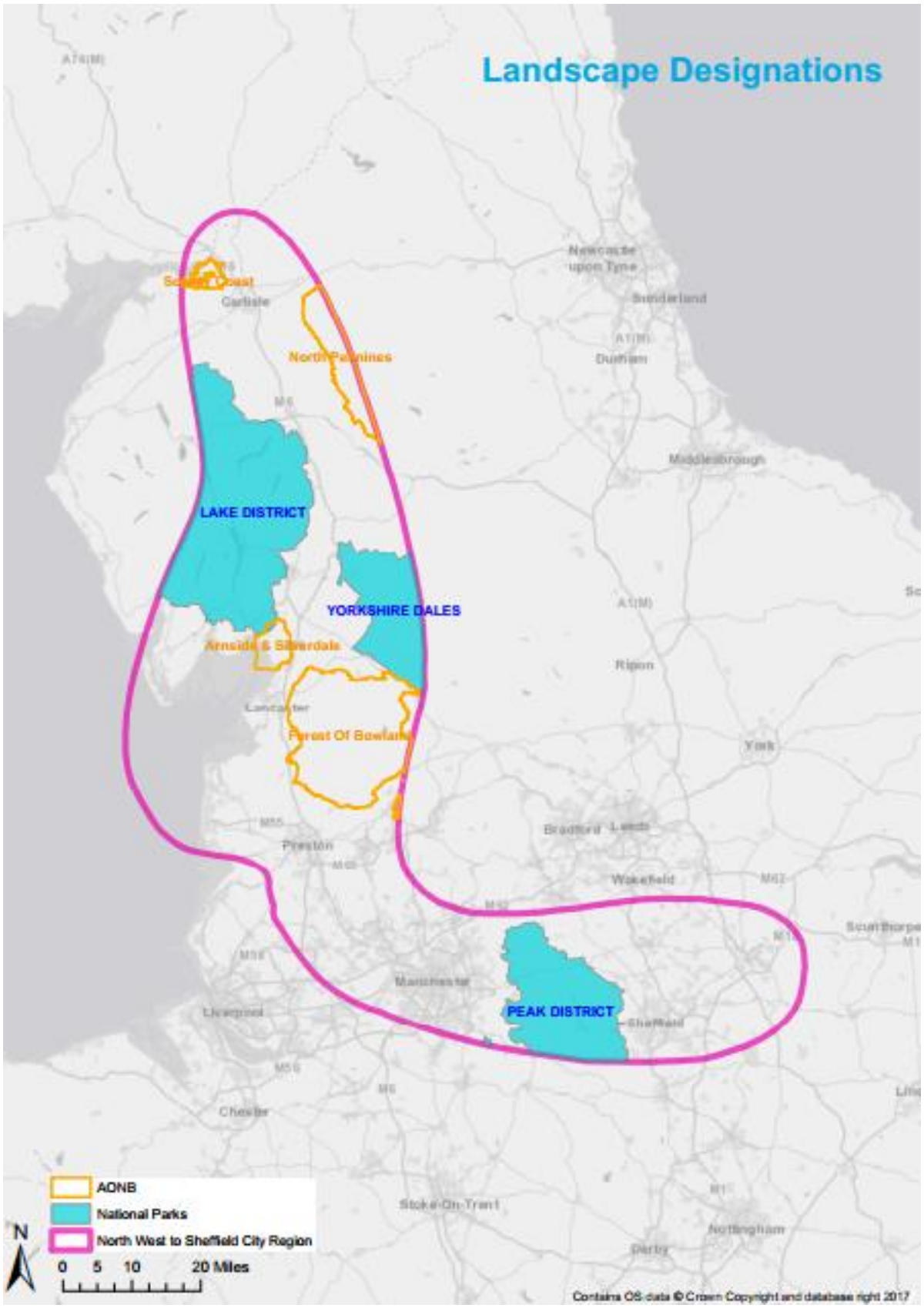
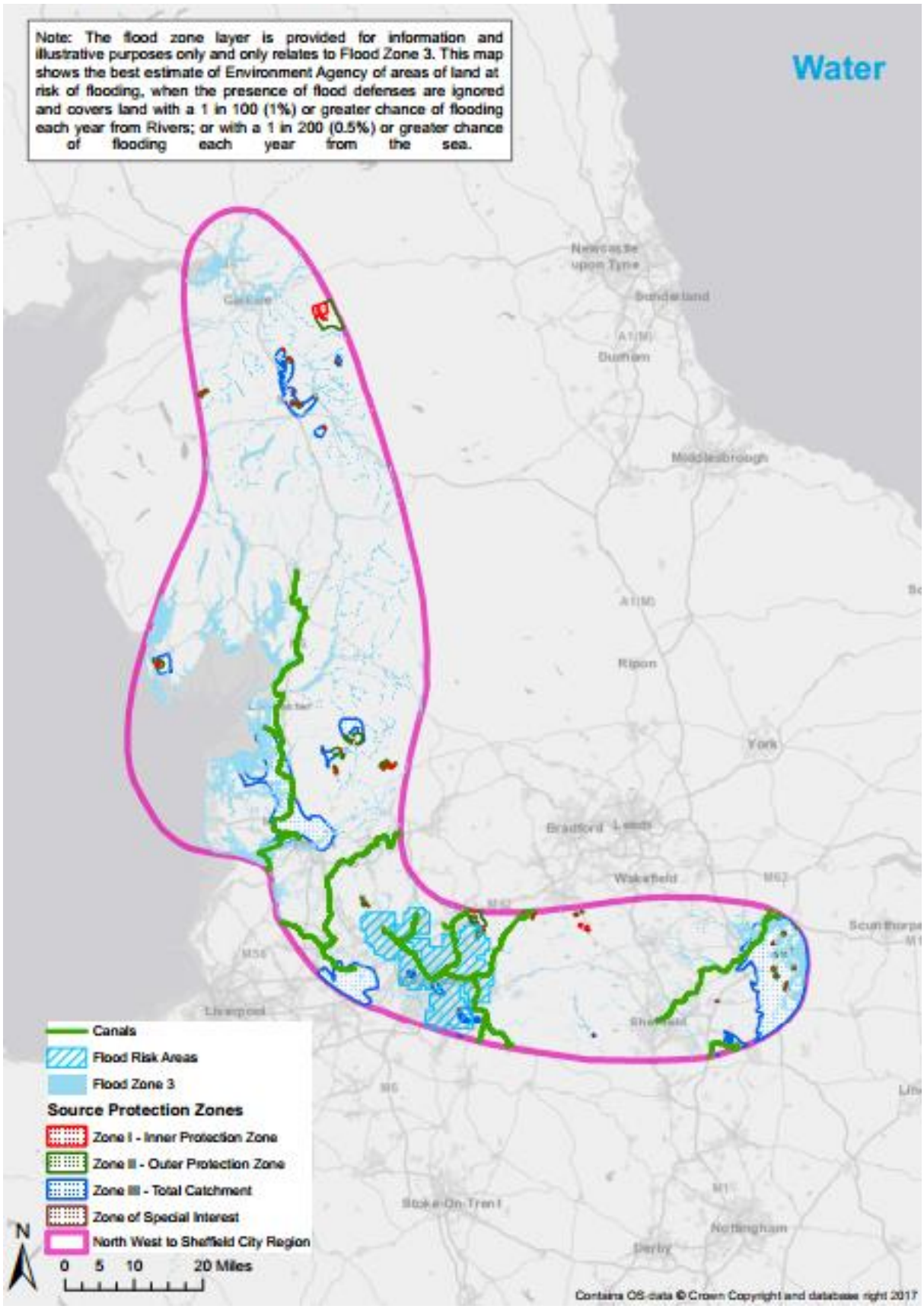


Figure H-45 SDC 5 - Water Features



H.7.3. SDC 5 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 5 - North West to Sheffield City Region (SDC 5) are as follows:

Assumed Intervention Types
Railways • New rail links • Rail infrastructure improvements • Station upgrades

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 5 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

	MOVEMENT			
	Trip km Increase			
	2015	**2025**	**2035**	**2050**
Rail	Low	Low	Low	Med
Road	Low	Low	Low	Med

	CARBON			
	CO_2e Increase (Red) / Decrease (Blue)			
	2015	**2025**	**2035**	**2050**
Low	Low	Low	Low	
Low	Med	Low	High	

Table H-12 Assessment of Strategic Development Corridors: SDC 5 – North West to Sheffield City Region

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✓/✗	Reg-Nat	MT-LT	Perm	High	--	+	++	+

Commentary

Short Term: Relative to other SDCs, SDC 5 has low levels of GHG emissions from road sources and low from rail. Overall, contributions within SDC 5 are overwhelmingly from road based sources, with rail levels growing at a low level and road emissions growing at a medium level over the short term. Effects are anticipated to be moderate adverse.

Medium Term: By 2035, carbon emissions from road should show a decline, with rail continuing to show low growth. Downward trends are likely to be due in large part to uptake of LZEVs, decarbonisation of the electrical grid and continuing rail efficiency improvements. Effects are anticipated to be slight beneficial.

Long Term: Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions. Road emission decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. As such there is potential for effects (positive and negative) from the new / upgraded infrastructure, depending upon the nature and location of interventions. Protected areas account for approximately 3,637km^2 which is about 34.51% of the total area of SDC 5. SDC 5 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued growth in road movement.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and medium growth in road movement, relatively to other SDCs, in this period.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and slight adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Tables 2 and 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local -Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include the range of potential rail interventions from which there is potential for effects (positive and negative) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **high risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the high sensitivity of assets and continued relatively high growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, potential effects are currently **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Table 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓	Local -Reg	LT	Perm	High	-	+	++	+

Commentary

Short Term: Within this SDC, the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a low level in this SDC relative to other SDCs and while it is anticipated to increase, this will be at a low rate compared to other SDCs. Emissions from road travel are anticipated to grow at a low rate relative to other SDCs. There are 48 AQMAs in this SDC, covering an area of 2.68% of the SDC. SDC 5 is considered at **medium risk** relative to other SDC. Effects are anticipated to be slight adverse.

Medium Term: Both road and rail travel increase during this time period (both at a low level relative to other SDCs). During this period, there is expected to also be a strong growth in LZEVs and this is reflected in a downward trend for emissions from road vehicles. Emissions from rail should grow in this period, as is to be expected as this SDC focuses on rail. Effects are anticipated to be slight beneficial.

Long Term: While road travel levels are anticipated to have increased at a medium rate relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEV. Rail travel will also have grown (at a medium rate relative to other SDCs) and this, allied to the growth in LZEV, should result in a fall in emissions. Emissions from road are therefore anticipated to decrease at a high rate relative to other SDCs. Rail emissions are likely to continue to increase. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local -Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Within this SDC, 901.54km^2 are located within Flood Zone 3, which makes up approximately 8.55% of the area. SDC 5 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience including, for example, SuDS, are being put in place under implemented interventions (including infrastructure upgrades). This SDC has medium level of road use relative to other SDCs and this may mean resilience is harder to achieve. Effects are anticipated to be slight adverse.

Medium Term: Length of railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. Road use is anticipated to have relatively low growth but existing road use levels are moderate relative to other SDCs. This may mean resilience is harder to achieve. Effects are anticipated to be slight adverse.

Long Term: By the 2050s the length of railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, this SDC has forecasted medium levels of road traffic growth and this could make resilience difficult to achieve. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5. At present 8.55% of the SDC is in Flood Zone 3 and measures would be required to address in particular these areas.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✗	Local -Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: This SDC is overwhelmingly located within the North West (59.98% of the SDC), Solway Tweed (20.99% of the SDC) and Humber (19.03% of the SDC) River Basins, with the WFD 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. This SDC has medium level of road use relative to other SDC and low road growth is predicted. This may mean protecting the water environment is difficult.

Medium Term: It is anticipated that an increase in rail travel in this SDC will reduce overall road use, helping reduce road runoff, and the range of measures promoted under the WFD would help to protect the water environment. Road use is anticipated to have relatively low growth but the existing level of road use is moderate relative to other SDCs. This could make protecting the water environment more difficult to achieve. Effects are anticipated to be slight adverse.

Long Term: It is anticipated that trends in increased rail use would increase further, along with WFD measures with resulting protection of the water environment. However, this SDC has forecasted medium levels of road traffic growth and this could make protecting the water environment more difficult to achieve. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	--	--	--	--

Commentary

Short Term: There is a range of agricultural land classifications across SDC 5, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a). There are some small pockets of Grade 1 to the west of the Greater Manchester area. There are also large tracts of poorer upland areas of Grade 5 centred on Cumbria and in the Pennines. It is also worth noting that in this SDC are located the large urban conurbations of Greater Manchester and Sheffield. Within this SDC approximate percentages of agricultural grade land are 0.42% Grade 1 (low risk relative to other SDCs), 4,61% Grade 2 (Medium risk relative to other SDCs), 30.91% Grade 3 (high risk relative to other SDCs), 22.5% Grade 4 (medium risk relative to other SDCs), and 25.28% Grade 5 (medium risk relative to other SDCs), while 13.48% is classed as Urban or Non-Agricultural (medium risk relative to other SDCs). Within this SDC there are three EA Special Sites identified, which are known to be contaminated. There are 206 Authorised Landfill sites (0.23% of the SDC area) and 946 Historic Landfill sites (0.83% of the SDC area). SDC 5 is considered to be at **high risk** relative to other SDCs in terms of high value agricultural land and known contamination. This SDC has moderate road use relative to other SDCs and anticipated low growth, which could result in moderate adverse effects in this area of high risk.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. The SDC is focused on rail measures. To the extent these may alleviate road transport negative effects against this ISA Objective may be reduced.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. The SDC is focused on rail measures. To the extent these may alleviate road transport negative effects against this ISA Objective may be reduced.

Overall, **moderate adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of soil resources, particularly those of higher quality / areas of better agricultural lands, should always be considered, in particular those areas of Grade 1 (0.42% of the SDC) such as to the west of Greater Manchester.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓/✗	Local-Reg	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Protected sites represent a total of about 1.95% of the SDC area (206km^2) and include the World Heritage Site of Frontiers of the Roman Empire (Hadrian's Wall), 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 STP aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features, e.g. historic railway stations. SDC 5 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. It is anticipated this will result in a mix of slight beneficial and adverse effects.

Medium Term: Protection of the full range of known sites will continue and it is likely that new sites will join the list. Low traffic growth added to existing moderate relative levels are anticipated to result in a mix of slight beneficial and adverse effects.

Long Term: 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. Low traffic growth added to existing moderate relative levels are anticipated to result in a mix of slight beneficial and adverse effects.

Overall, a **mix of slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHS of Frontiers of the Roman Empire (Hadrian's Wall).

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local	ST-LT	Perm	High	--	-	-	-

Commentary

Short Term: Three National Parks and five AONBs are within the SDC 5 area. These AONBs have an area of about 1,030km^2 representing about 9.77% of this SDC. SDC 5 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 5 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, etc. In some instances, though, there would be potential for enhancement. However, for the most part effects are anticipated to be moderate adverse due to the high risk potential.

Medium Term: Areas currently protected for their landscape / townscape would still receive that protection, but new interventions would still represent new features in the landscape. However, screening would have reduced adverse effects. Effects are anticipated to be slight adverse**.**

Long Term: Those areas currently protected for their landscape / townscape would still receive that protection but any interventions would still represent new features in the landscape. However, screening would have reduced adverse effects arising from medium traffic growth (relative to other SDC).

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓/✗	Local -Reg	ST-LT	Perm	Low	-	+/-	+/-	+/-

Commentary

Short Term: Within this SDC, it is estimated that total local authority waste collected is 2,074,381 tonnes (0.34tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 58.63% of total SDC LA collected waste is not sent for recycling. This rate is low relative to the other SDC and may be considered slight adverse as it may be relatively more difficult to meet this ISA Objective.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 5 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there could still be issues relating to meeting recycling objectives in this SDC. Effects would be a mix of beneficial and adverse.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 5 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there will always be some waste that is not reused and as such there will be a mix of beneficial and adverse effects.

Overall, a **mix of slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓	Reg-Nat	ST-LT	Perm	High	+	+	++	+

Commentary

Short Term: The range of transport interventions proposed under this SDC are limited to rail improvements. All these intervention types are likely to make rail more attractive to travellers and would represent a lower carbon option compared to road travel. It is anticipated that measures within the STP would help to address issues of affordability. Relative to other SDCs, SDC 5 has low levels of GHG emissions from road sources and low from rail. SDC 5 is thus considered to be at **low priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV use, are anticipated to result in slight beneficial effects. There are low rates of relative growth anticipated for both road and rail. By 2035, carbon emissions from road should show a decline, while rail is anticipated to show slight growth. These trends are likely to be due to uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight beneficial.

Long Term: Continued encouragement of public transport use would represent beneficial effects, though new highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, with a continued low growth in rail emissions. There is anticipated to be medium growth (relative to other SDCs) in rail use. Effects are anticipated to be moderate beneficial.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local -Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 5. A number of inferences are also made through assessment of the constituent Local Enterprise Partnership (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 5 attributes £130billion, in line with an SDC average of £131billion. Income deprivation is averaged at 24.75%, below an SDC average of 27.05%. SDC 5 is also found to attribute one of the lowest percentage population receiving job seekers allowance, at 1.50%. This is below an SDC average of 1.68%.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 1 will benefit to a slight extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 5 area will increase by an additional £33.1bn and there will be an additional 334k jobs. This represents a moderate beneficial effect relative to other SDCs.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓✓	Local -Reg	ST-LT	Perm	High	+	++	++	++

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. There are 20 Local Authorities in this SDC and it is the third smallest of the SDCs. This may make coordination relatively easier in comparison to most other SDCs, but full beneficial effects may not be experienced in the short term.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The relatively small size and low number of authorities may make it relatively easier to coordinate, etc. Effects are anticipated to be moderate beneficial.

Long Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The relatively small size and low number of authorities may make it relatively easier to coordinate etc. Effects are anticipated to be moderate beneficial.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local -Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen rail connectivity in Sheffield City Region, Cumbria and Lancashire and their advanced manufacturing, health technology, digital businesses and research centres. This will also serve Manchester as it falls directly in-between these areas. Currently on the line between Blackpool North, Preston and Manchester journey times and frequencies are being improved. Furthermore, North-West to Sheffield by rail is not well connected. Therefore, connecting these areas together, when they had previously poor connectivity, will open up the potential job opportunities and access to a wider range of services. This would be particularly beneficial to those communities who currently do not have good access to jobs, faith centres or social care services. Greater Manchester has the highest proportions of black and minority ethnic populations across the North (16%). Furthermore, Greater Manchester has the highest percentage of people in the most deprived areas in this SDC. Sheffield City Region also has one of the highest percentages of DLA claimants within the North. In SDC 5 29% of people are in highest income deprivation quintile; this is in line with the 28% figure across the North.

Medium Term: As the infrastructure develops, connecting a greater number of areas within Sheffield, Manchester, Cumbria and Lancashire may lead to them becoming stronger and offering a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. When strengthening the connectivity between the areas it is important to consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, such as increased levels of traffic increasing the level of perceived severance. Any impacts, such as increased air quality levels, as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local -Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Strengthening the connectivity between Cumbria, Lancashire, Greater Manchester and Sheffield could enable a wider range of people to access a number of services, such as healthcare. It could also create a mode shift from car to rail, and therefore reduce the number of cars on the roads, improving air quality in some areas. This could have a big impact in areas with high deprivation. Residents in Lancashire, Greater Manchester and Sheffield City Region have 7% of people in bad and very bad health compared to other areas in the North. The average life expectancy for those living in the LEPs in SDC 5 is in line with the average in the North, but slightly above that of England.

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. Promoting and enhancing rail services could have a mode shift, and therefore positive health effects associated with a reduction in air pollution.

Long Term: As with the medium term, there will be the potential benefits and negative effects of widening the number of services accessible to people and possibly increasing the attractiveness of rail to create a mode shift from car to rail.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air quality levels as a result of road enhancement schemes, need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Redevelopment and improved integration of stations have the potential to improve the perception of community safety and reduce the fear of crime. Greater Manchester and Sheffield City Region have the higher crime rates in the SD5 corridor. Whereas Cumbria and Lancashire have below average crime rates compared to the average in the North.

Medium Term: It is anticipated that more upgrades to stations and other user facilities, creating a modern travelling environment, would improve perceived community safety.

Long Term: As with the medium term, more enhancements are likely to reduce perceived level of fear of crime.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. When improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is important to consider the local areas when looking at improving interchanges. Areas with the highest crime deprivation would benefit most from increased perception of community safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between manufacturing and research centres across the North could create a number of job opportunities for a wider range of people, especially those with previously poor connectivity. Greater Manchester has some of the highest levels of income deprivation in the North. Whereas Cumbria, Lancashire and Sheffield Region are in line or below the average income deprivation levels in the North.

Medium Term: Infrastructure to connect the major employment areas could improve employment levels in a wider range of areas, and therefore to a wider range of people. Sheffield City Region and Greater Manchester have 2% of people claiming Job Seekers allowance, compared to 1% in Lancashire and Cumbria.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation, which may also have high levels of health deprivation and disability. Greater Manchester has some of the highest levels of health deprivation and disability in the North, significantly above the average for the North. Whereas Cumbria, Lancashire and Sheffield City Region are in line with the average across the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation in some of the most deprived areas.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure information is disseminated effectively to the public, making a particular effort to ensure timetabling and ticket price information is available to lower income groups, older people and disabled people. Promotional materials need to use uncomplicated language and information, in order to ensure the information is understandable for all. New transport provision should be priced in line with current transport options.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Any improvements/modernisation to stations and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. Greater Manchester, has higher than average Black and Minority Ethnic populations, whilst Greater Manchester and Sheffield City Region have higher levels of disability living allowance claimants.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Med	0	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport, as an option, by making it easier and more efficient to travel by rail could create a mode shift from car to rail. This would reduce the number of cars on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people.

Medium Term: As the infrastructure is implemented, a greater number of people may choose rail over car travel and therefore improve safety by reducing the number of cars on the road

Long Term: As with the medium affects, any affects from the enhanced rail infrastructure could have long term beneficial effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should consider the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers. This is important when enhancing/building interchanges that may attracted and increased amount of traffic to the local area.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport, as an option by making it easier and more efficient to travel by rail, could create a mode shift from car to rail. This would reduce the number of cars on the road and therefore, reduce levels of perceived severance. This is especially important in dense urban areas where a high proportion of households do not have access to a car, also areas with high levels of children and areas of high levels of income deprivation. However, any enhanced or new interchanges, which could attract an increased amount of traffic, could increase levels of severance in the local area.

Medium Term: As the infrastructure developed in the medium term and enhances rail connections this could continue to reduce the number of cars on the road, especially in urban areas, and therefore, reduce perceived severance.

Long Term: There could be long term beneficial effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as Asthma. There is a higher than average percentage of Children in Greater Manchester and Lancashire compared to the average across the North.

Medium Term: Any potential effects from reduced traffic and therefore air and noise pollution can have medium term effects.

Long Term: Any potential effects from reduced air and noise pollution can have long term beneficial effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local -Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between manufacturing and research centres across the North could create a number of job opportunities for a wider range of people especially increased with previously poor connectivity. Greater Manchester has some the highest levels of income deprivation in the North. Whereas Cumbria, Lancashire and Sheffield Region are in line or below the average income deprivation levels in the North. Therefore, improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those with high levels of income deprivation could be beneficial to health.

Medium Term: Infrastructure to connect the major employment areas, could reduce unemployment in a wider range of areas. Sheffield City Region and Greater Manchester have 2% of people claiming Job Seekers allowance, this is compared to 1% in Lancashire and Cumbria.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation, which may also have high levels of health deprivation and disability. Greater Manchester have some of the highest levels of health deprivation and disability in the North, significantly above the average for the North. Whereas Cumbria, Lancashire and Sheffield City Region are in line with the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improve the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Sheffield City Region, 28% of people are in areas with the highest level of income deprivation, for Greater Manchester this is 35%. Lancashire and Cumbria 28% and 11% respectively.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation in some of the most income deprived areas, within Greater Manchester. It could also help reduce health deprivation and disability levels in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low-income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Any improvements/modernisation to rail stations and waiting facilities could have increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local -Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail could create a mode shift from car to rail. This would reduce the number of cars on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people.

Medium Term: As the infrastructure is implemented, a greater number of people may choose rail over car travel and therefore improve safety by reducing the number of cars on the road

Long Term: As with the medium affects, any affects from the enhanced rail infrastructure could have long term beneficial effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Measures to enhance safety for all road users should be central in the design of new infrastructure. This is especially important for local areas surrounding multi-modal interchanges, maximising the safety benefits for drivers, pedestrians and cyclists.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local -Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail, could create a mode shift from car to rail. This would reduce the number of cars on the road and therefore, reduce levels of perceived severance. This is especially important in dense urban areas where a high proportion of households do not have access to a car, also areas with high levels of children and areas of high levels of income deprivation. However, any enhanced or new interchanges which could attract an increased amount of traffic by the interchange, could increase levels or perceived severance in the local area.

Medium Term: As the infrastructure developed in the medium term and enhances rail connections this could continue to reduce the number of cars on the road, especially in urban areas, and therefore, reduce perceived severance. the severance

Long Term: There could be long term beneficial effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When introducing stations or transport corridors, it is important consider whether they are severing public right of ways and pedestrian footpaths as these may have an increase in perceived severance. Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance, particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local -Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Any enhancements in public transport which could create a mode shift, could have beneficial effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. 7% of people in Greater Manchester, Lancashire and Sheffield City Region are in bad and very bad health, this is 6% in Cumbria.

It is important to consider the health affects an increase in local traffic and therefore, air and noise pollution as a direct consequence of any enhanced/new train stations.

Medium Term: Any potential health effects from reduced traffic and therefore, air and noise pollution can have medium term effects.

Long Term: Any potential health effects from reduced traffic and therefore, air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. schools. Furthermore, people which have long term conditions, such as asthma will be particularly vulnerable in areas with increased air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local -Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester, Cumbria and Sheffield City Region has below average killed or seriously injured for the North. Lancashire has rates above average for the North. Public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents. However, it is important to consider any increased traffic that new or enhanced rail stations may bring to the local area, this may have a negative impact on accidents in the vicinity close to the station.

Medium Term: There is the potential effect in the medium-term dependent on the infrastructure implemented, however, this depends on the uptake of public transport.

Long Term: The long-term effect is dependent on the specific enhancement to public transport corridors and the mode shift this creates.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local -Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Greater Manchester and Sheffield City Region have higher than average crime levels for the North, whereas Cumbria and Lancashire have below average rates. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety.

Long Term: There could be improved community safety in the long term with the enhancement of services being developed over a number of year, and the uptake taking a while to reach its full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

H.8. SDC 6 East Coast to Scotland

H.8.1. SDC 6 Datasheet

Table H-13 SDC 6 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	13	0.04	0.00014
Designated Sites	SAC	26	5	0.07364
	SPA	9	4.95	
	SSSI	260	7.01	
	Ramsar	7	0.47	
	NNR	11	0.41	
	LNR	133	0.23	
	WHS	3	0.89	0.00347
	EA Special Areas	2	N/A	-
	AONB	3	4.74	0.08749
	National Parks	2	17.62	
Water	Flood Zones	580.45km^2	5.29	0.02070
	Flood Risk Areas	0	N/A	-
Landfill	Authorised Landfill Sites	130	0.17	0.00277
	Historic Landfill sites	1297	0.54	
Agriculture	Agricultural Land Grades	Grade 1: 9.60 km^2	0.09	-
		Grade 2: 684.21 km^2	6.24	-
		Grade 3: 5233.00 km^2	47.70	-
		Grade 4: 1283.13 km^2	11.70	-
		Grade 5: 1707.34 km^2	15.56	-
		Urban: 685.56 km^2	6.25	-
		Non Agri: 396.16 km^2	3.61	-
Heritage	Listed Buildings	18931	N/A	-
	Registered Battlefields	10	0.18	0.00727
	Registered Parks and Gardens	92	1.11	
	Scheduled Monuments	2151	0.57	

Ancient Woodland	Ancient Woodlands	1937	N/A	-

H.8.2. SDC 6 Mapping

Figure H-46 SDC 6 - Agricultural Land Classifications

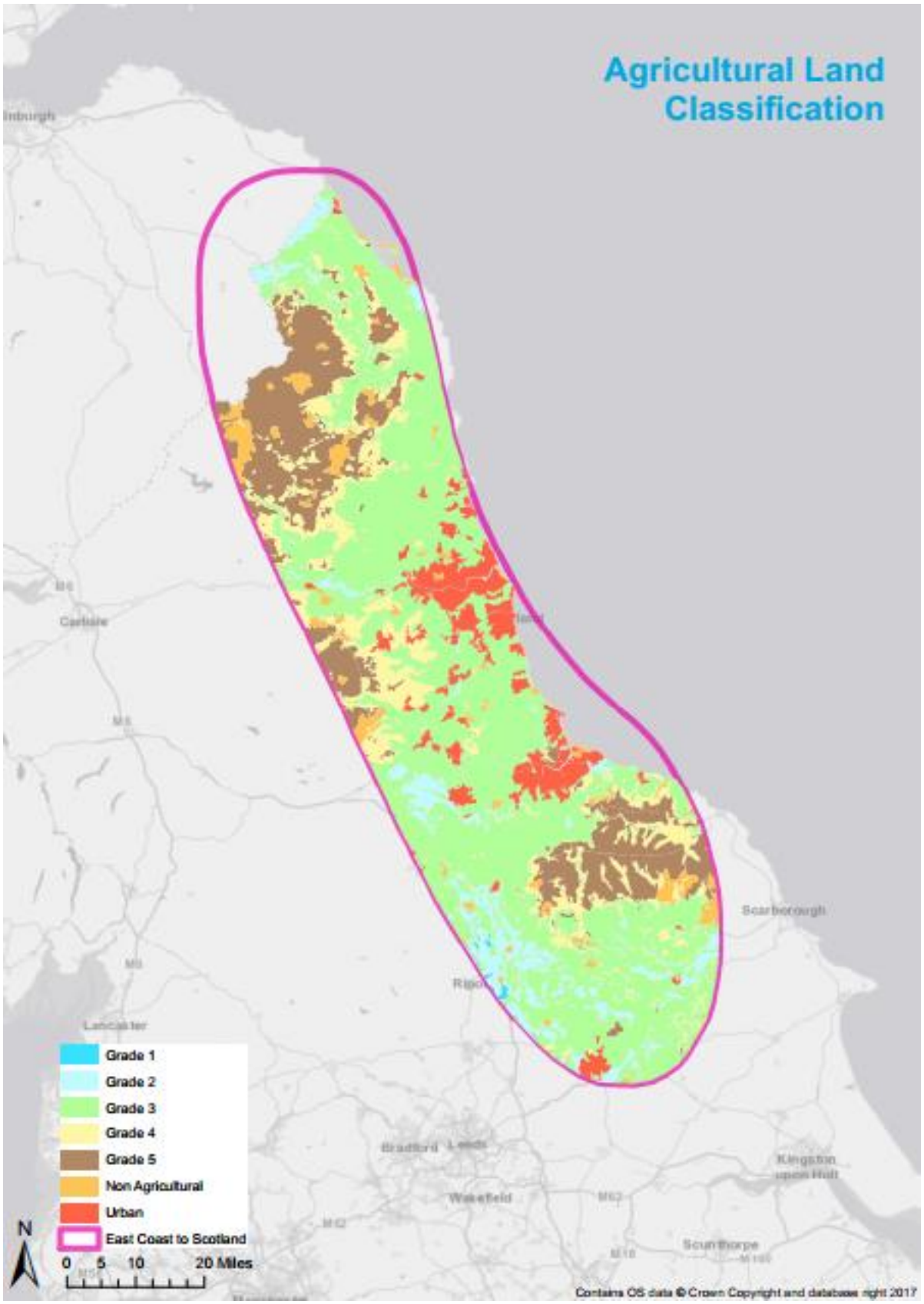


Figure H-47 SDC 6 - Air Quality Management Areas

Figure H-48 SDC 6 - Ancient Woodland

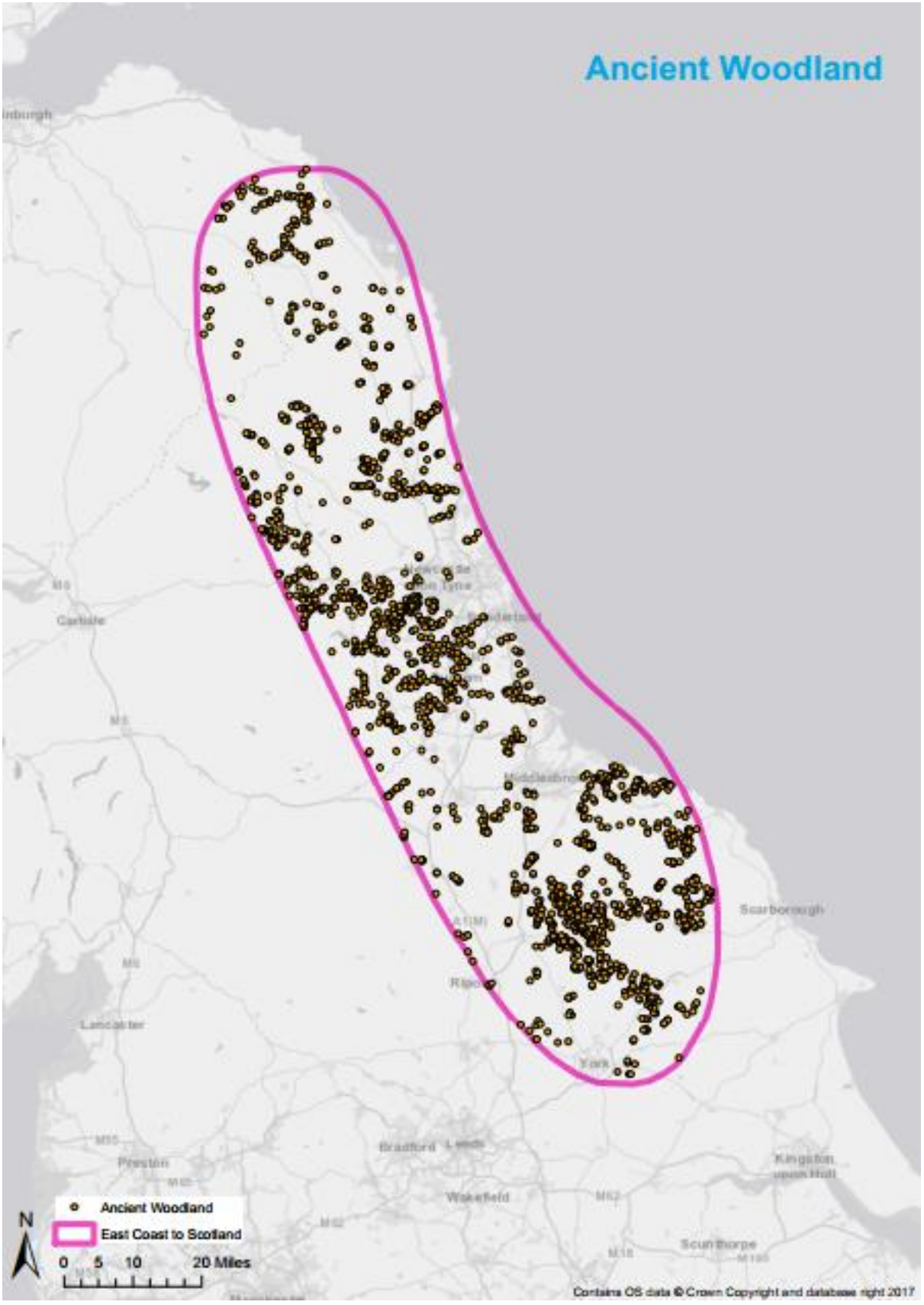


Figure H-49 SDC 6 - Designated Sites

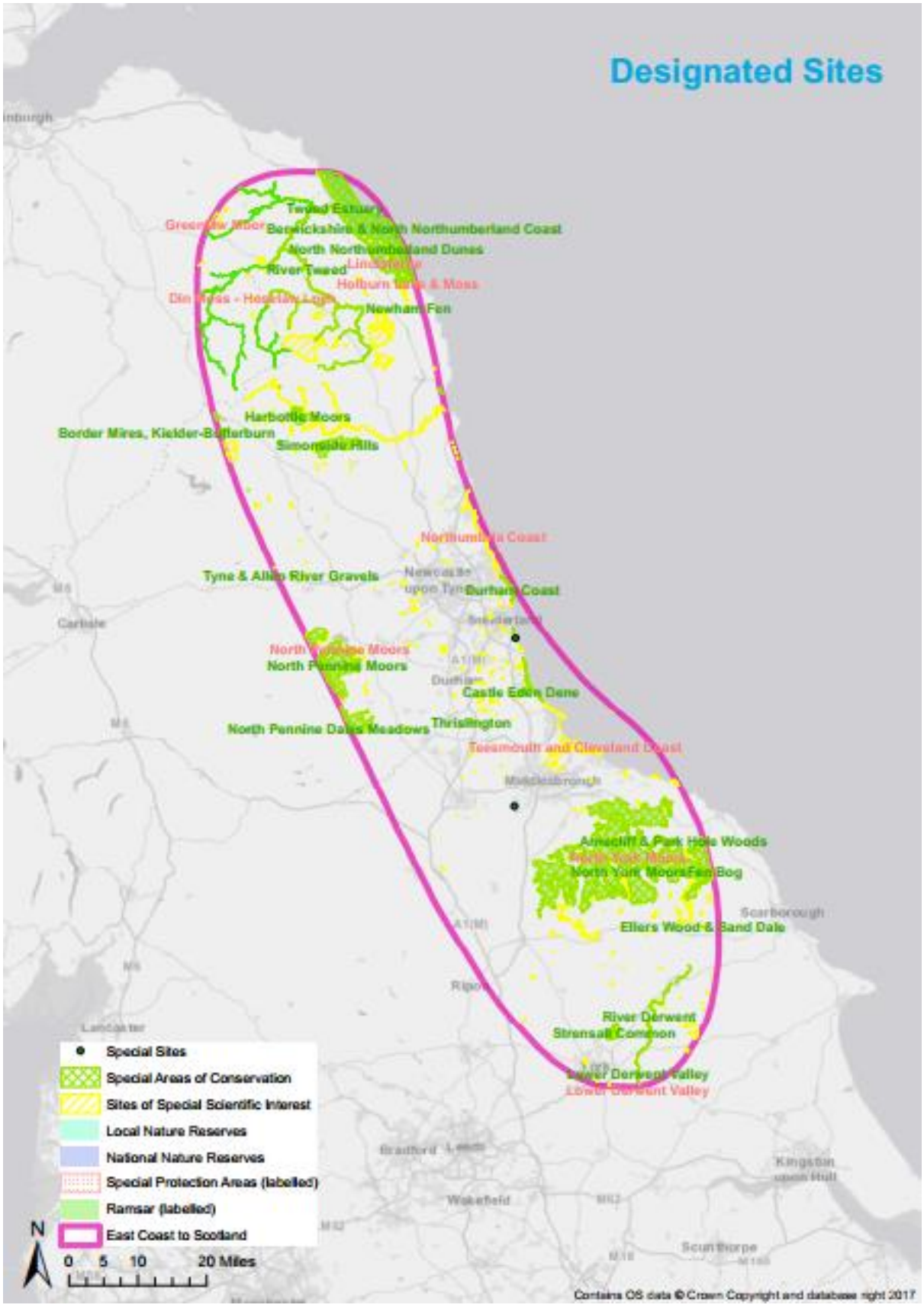


Figure H-50 SDC 6 - Heritage Sites

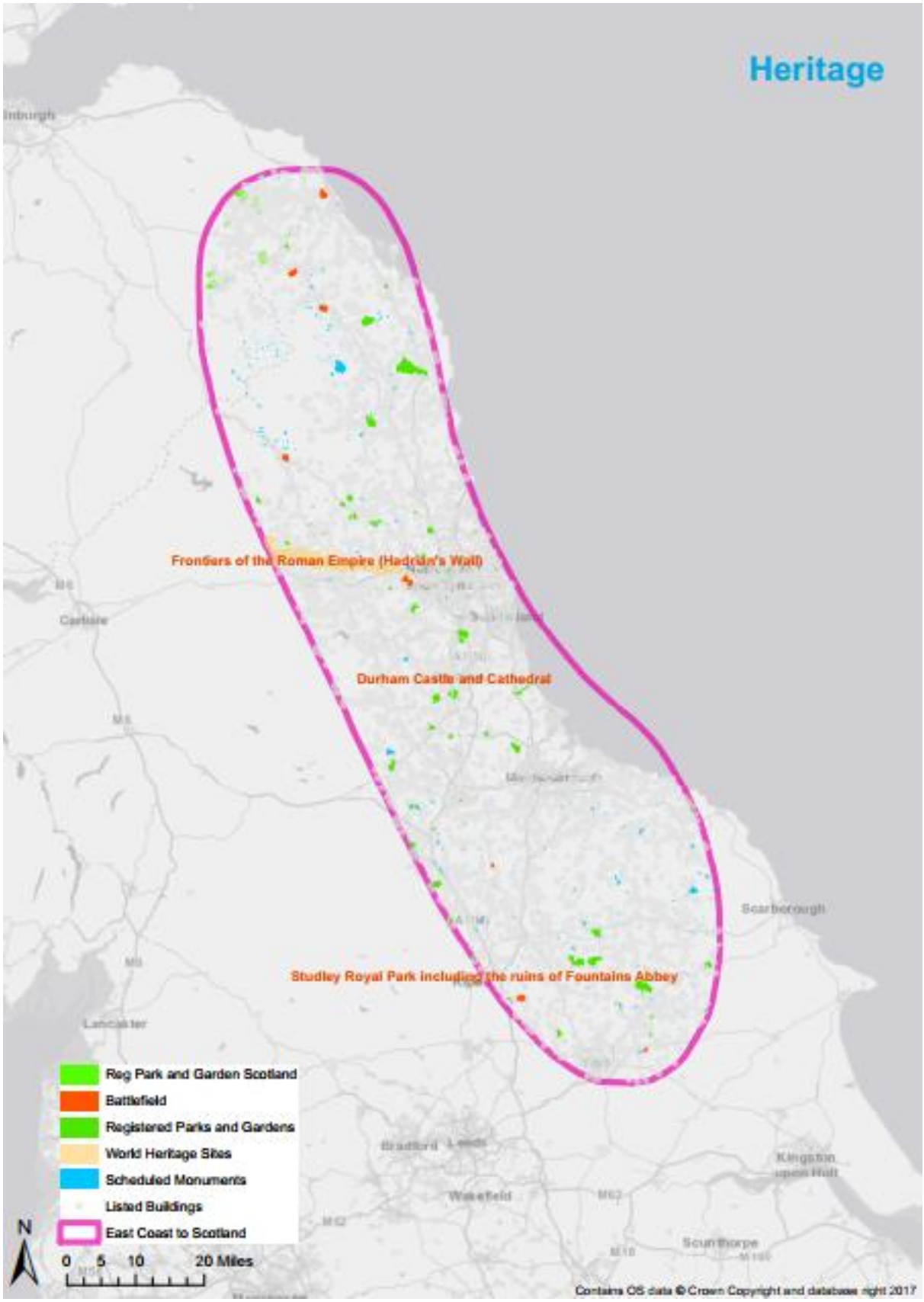


Figure H-51 SDC 6 - Historic and Authorised Sites

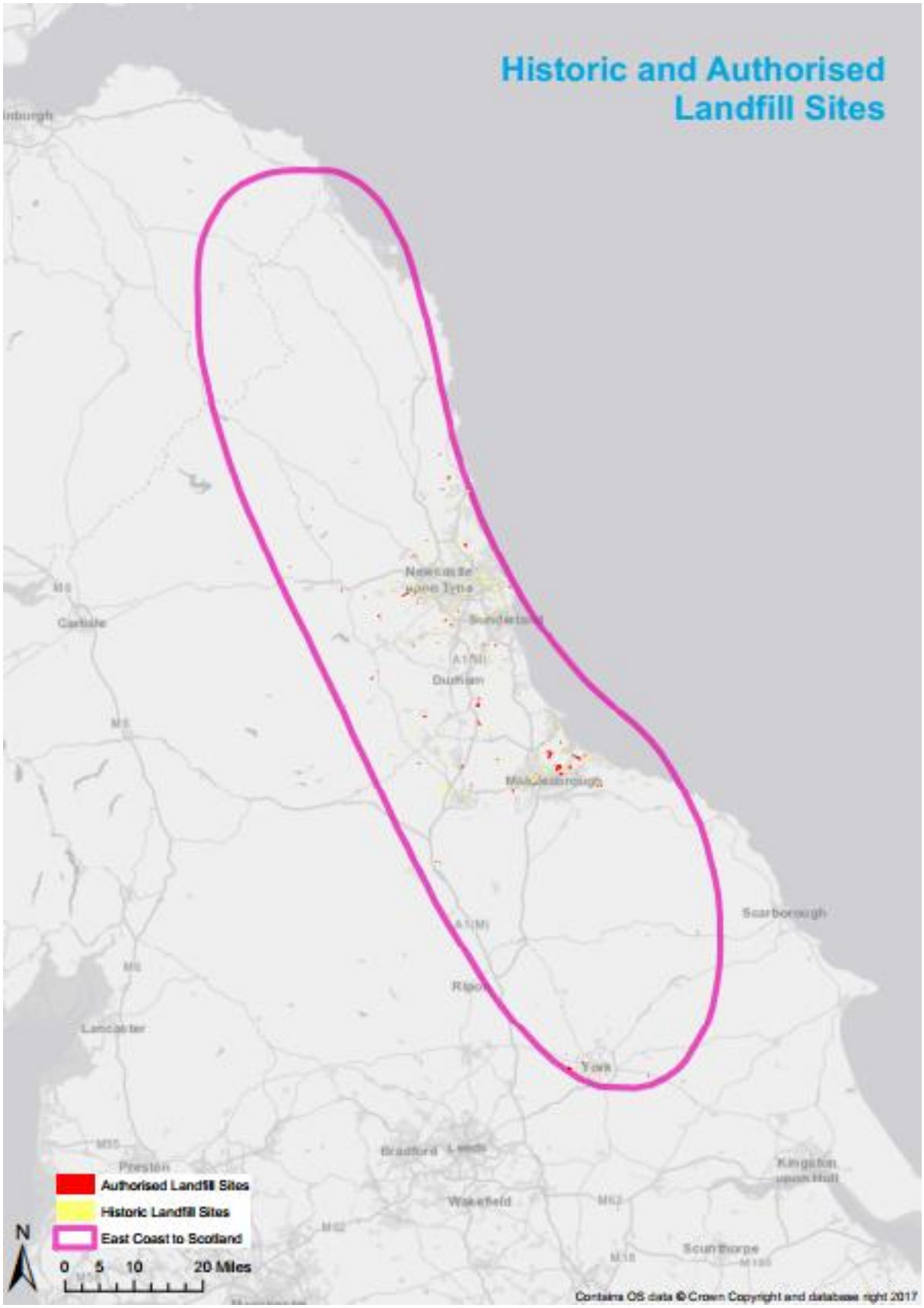


Figure H-52 SDC 6 - Landscape Designations

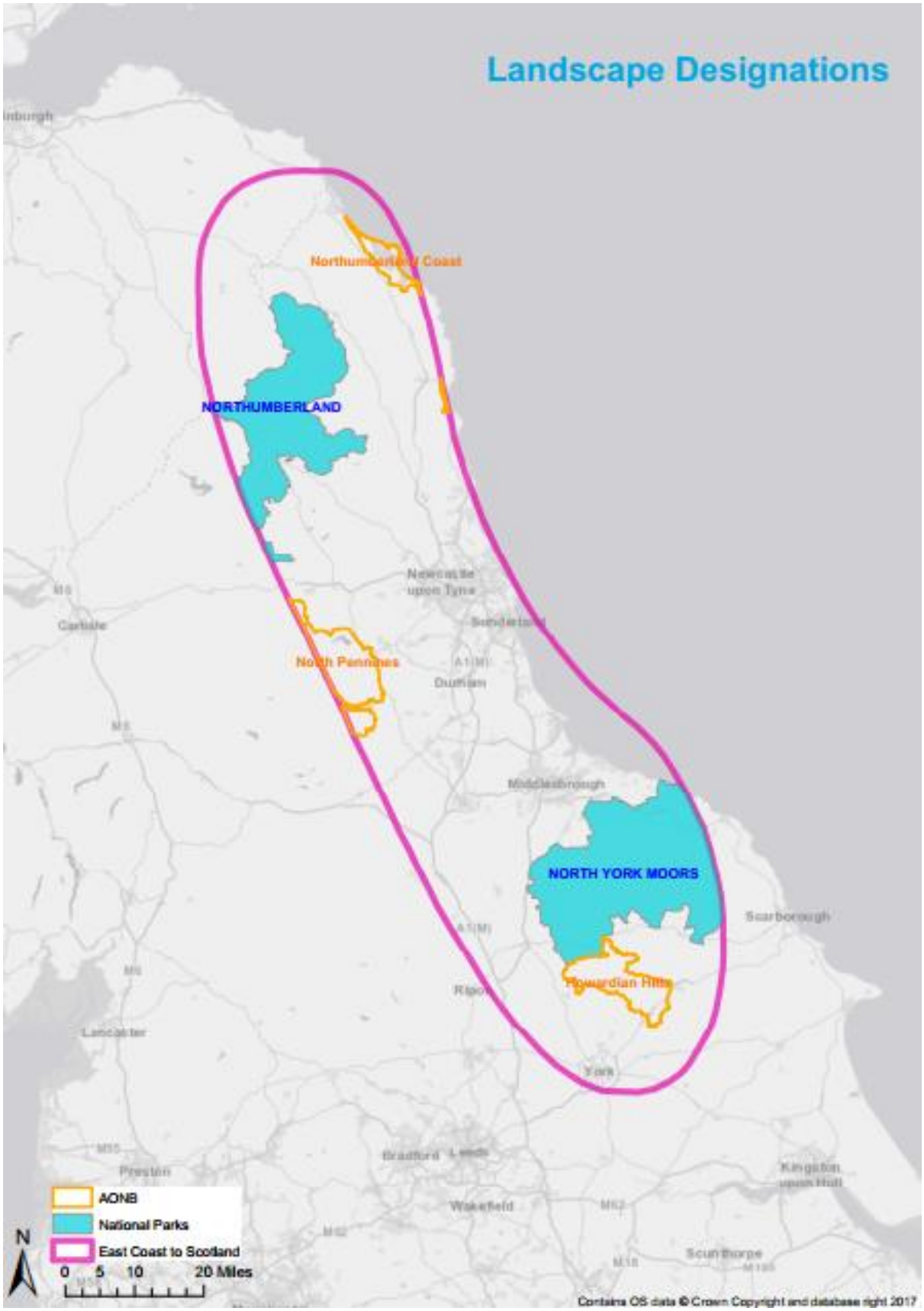
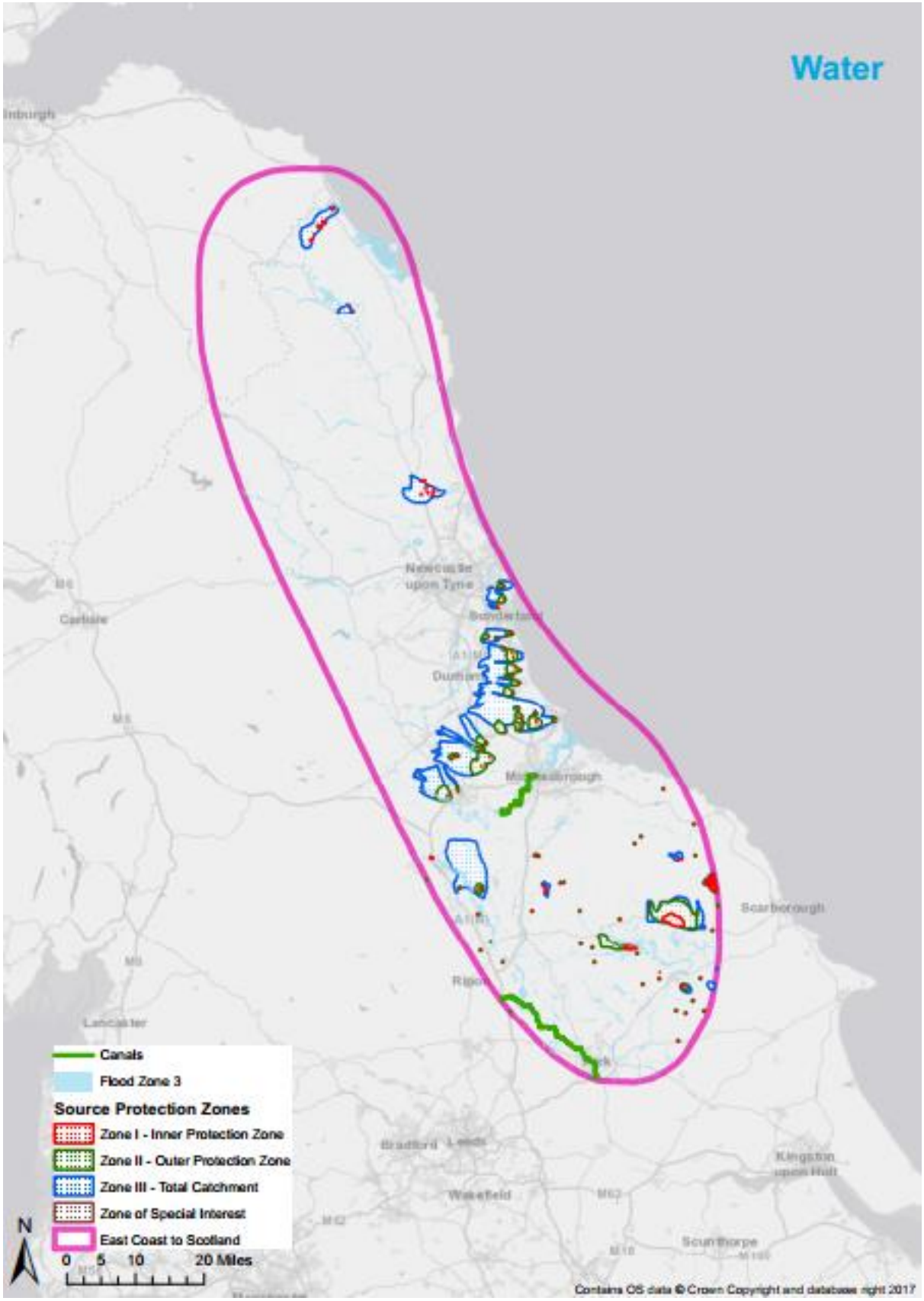


Figure H-53 SDC 6 - Water Features



H.8.3. SDC 6 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 6 - East Coast to Scotland (SDC 6) are as follows:

Assumed Intervention Types
Railways • New rail links • Rail infrastructure improvements • Station upgrades

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 6 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

Trip km Increase	2015	2025	2035	2050
Rail	High	Low	Low	High
Road	Med	Low	Med	High

CARBON

CO_2e Increase (Red) / Decrease (Blue)	2015	2025	2035	2050
	High	Low	Med	High
	Med	Med	Low	High

Table H-14 Assessment of Strategic Development Corridors: SDC 6 – East Coast to Scotland

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✗	Reg-Nat	MT-LT	Perm	High	--	-	-	-

Commentary

Short Term: Relative to other SDCs, SDC 6 has medium levels of GHG emissions from road sources but high levels from rail. Overall, the majority contributions within SDC 6 are from road based sources, though with rail at a high level relative to other SDCs and with rail emission levels growing at a low rate and road emissions growing at a medium rate over the short term. Effects are anticipated to be moderate adverse.

Medium Term: By 2035, carbon emissions from road are expected to show a continuing slight increase, while rail are expected to show medium growth. These trends are likely to be due to the uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight adverse.

Long Term: Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, but high growth in rail emissions. Road emission decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. Protected areas account for approximately 1,950km^2, which is 18.2% of the total area of SDC 6. SDC 6 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. There is potential for some beneficial and adverse effects for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of interventions.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and medium growth in road movement.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and relatively high growth in road movement, relatively to other SDCs, in this period.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include the range of potential rail interventions from which there is a potential for effects (positive and negative) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **medium risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued medium growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued relatively high growth in both road and rail movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that in relation to this ISA Objective in isolation, potential effects are currently **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Tables 2 and 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	LT	Perm	High	--	--	+	-

Commentary

Short Term: Within this SDC the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a high level in this SDC relative to other SDCs and it is anticipated to increase at a low rate. There are 13 AQMA within this SDC, which is low relative to other SDCs. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period, at moderate and low rates, respectively, relative to other SDCs. During this period, there is also expected to be a strong growth in LZEVs, with relatively low growth of emissions from road vehicles and continued moderate growth in emissions from rail. Effects are anticipated to be moderate adverse.

Long Term: While road travel levels are anticipated to have increased at a high rate relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEVs. Rail travel will also have grown at a high rate relative to other SDCs. Growth in LZEV use means emissions from road are anticipated to decrease at a high rate relative to other SDCs, but the growth in rail emissions will mean that effects on air quality are only anticipated to be slight beneficial.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: Within this SDC 580.45km^2 are located within Flood Zone 3, which makes up approximately 5.29% of the SDC area. SDC 6 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience including, for example, SuDS, are being put in place under implemented interventions (including infrastructure upgrades). However, high levels of rail use may make resilience more difficult to achieve.

Medium Term: Length of railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. Medium levels of road growth, relative to other SDC, may make resilience more problematic to achieve and effects are anticipated to be slight adverse.

Long Term: By the 2050s the length of railway at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, this SDC has forecasted high levels of road and rail traffic growth and this could make resilience difficult to achieve. Effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/✗	Local-Reg	MT-LT	Perm	Med	+	-	--	-

Commentary

Short Term: This SDC is overwhelmingly located within the Northumbria (56.94% of the SDC), Solway Tweed (14.12% of the SDC) and Humber (28.94% of the SDC) River Basins, with the WFD ensuring there is a good understanding of water management and quality issues in each. For example, in Northumbria, 4% of the River Basin is significantly impacted by pollution from towns, cities and transport.

Medium Term: It is anticipated that an increase in rail travel in this SDC will reduce overall road use, helping to reduce road runoff, and the range of measures promoted under the WFD would help to protect the water environment. Medium levels of road growth, relative to other SDC, may make protecting the water environment problematic to achieve and effects are anticipated to be slight adverse.

Long Term: It is anticipated that trends in increased rail use would continue, along with WFD measures with resulting protection of the water environment. However, this SDC has forecasted high levels of road and rail traffic growth and this could make resilience difficult to achieve. Effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: There are a range of agricultural land classifications across SDC 6, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a). There are some small pockets of Grade 1 to the south west boundary of the corridor (to the west of Ripon). There are also large tracts of poorer upland areas of Grade 5 centred on the North York Moors and close to the border with Scotland. It is also worth noting that in this SDC are located the large urban conurbations of Newcastle Upon Tyne, Sunderland and the Tees Valley area. Within this SDC approximate percentages of agricultural grade land are 0.09% Grade 1 (low risk relative to other SDCs), 6.24% Grade 2 (medium risk relative to other SDCs), 47.7% Grade 3 (high risk relative to other SDCs), 11.7% Grade 4 (medium risk relative to other SDCs), and 15.56% Grade 5 (medium risk relative to other SDCs), while 9.86% is classed as Urban or Non-Agricultural (medium risk relative to other SDCs). Within this SDC, there are two EA Special Sites identified, which are known to be contaminated. There are 130 Authorised Landfill sites (0.17% of the SDC area) and 1,297 Historic Landfill sites (0.54% of the SDC area). SDC 6 is considered at **medium risk** relative to other SDCs in terms of high value agricultural land and known contamination.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. There would be relatively high levels of both road and rail growth in this area of medium risk.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Of particular note, protection of soil resources, particularly those of higher quality / areas of better agricultural lands, should always be considered, and especially those areas of Grade 1 (0.09% of the SDC) to the west of Ripon.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings	✓	Local-Reg	ST-LT	Perm	Low	-	--	-	-

Commentary

Short Term: Protected sites represent a total of about 2.47% of the SDC area (269km^2) and include the World Heritage Site of Frontiers of the Roman Empire (Hadrian's Wall), Durham Castle and Cathedral and Studley Royal Park, which receive 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 STP aims to encourage archaeological investigation which will help aid understanding and there

may be opportunities to enhance features, e.g. historic railway stations. SDC 6 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. Road and rail are expected to grow at low levels and it is anticipated this would result in slight adverse effects.

Medium Term: Protection of the full range of known sites will continue and it is likely that new sites will join the list. Moderate growth in road movement is expected in this period. Effects are anticipated to be moderate adverse.

Long Term: 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. High growth in both road and rail movement is anticipated in this period. However, it is anticipated that a high proportion of road vehicles will be LZEVs. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHSs of Frontiers of the Roman Empire (Hadrian's Wall), Durham Castle and Cathedral and Studley Royal Park.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local-Reg	ST-LT	Perm	High	--	-	--	--

Commentary

Short Term: Two National Parks and three AONBs lie within the SDC 6 area. These AONBs have an area of about 520km^2, representing about 4.74% of the SDC. SDC 6 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 6 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, etc. In some instances, though, there would be potential for enhancement. But for the most part effects are anticipated to be moderate adverse.

Medium Term: Areas currently protected for their landscape would still receive that protection, but new interventions would still represent new features in the landscape. Road movement is expected to grow at a moderate rate, and rail movement at a low rate, during this period. It is anticipated this would result in moderate adverse effects.

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 have reduced adverse effects. High growth rates for both road and rail movement are expected in this period.

Overall, **moderate adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9. Of particular note is the need to protect the areas of National Parks.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓/✗	Local	ST-LT	Perm	Low	-	+/-	+/-	+/-

Commentary

Short Term: Within this SDC it is estimated that total English local authority waste collected is 3,349,443 tonnes (1.19 tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 57.83% of total SDC English LA collected waste is not sent for recycling, which is a medium priority relative to other SDCs. However, this SDC has a high level of waste generation relative to other SDCs and this may make dealing with waste relatively more difficult in this SDC, with slight adverse effects.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 6 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there could still be issues relating to meeting recycling objectives in this SDC due to levels of waste generated. Effects would be a mix of beneficial and adverse.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 6 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there will always be some waste that is not reused and as such there will be a mix of beneficial and adverse effects.

Overall, a mix of **slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✓/✗	Reg-Nat	ST-LT	Perm	High	--	--	+	-

Commentary

Short Term: The range of transport interventions proposed under this SDC is limited to rail improvements. All these intervention types are likely to make rail more attractive to travellers and would represent a lower carbon option compared to road travel. It is anticipated that measures within the STP would help to address issues of affordability. Relative to other SDCs, SDC 6 medium levels of GHG emissions from road sources and high levels from rail. SDC 6 is thus considered to be at **medium priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued emphasis on public transport in and between urban areas and continued implementation of smart mobility technology, along with growing LZEV use, are anticipated to result in slight beneficial effects. However, by 2035, carbon emissions from road are expected to still show low growth, and rail emissions are expected to show medium growth. These trends are likely despite uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be moderate adverse.

Long Term: Continued encouragement of public transport use would represent beneficial effects. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, together with a large rise in rail emissions, due to the uptake from rail promoted in this SDC. Effects are anticipated to be slight beneficial.

Overall, **slight adverse** effects are anticipated in relation to this ISA objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+	+++	+++	+++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 6. A number of inferences are also made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 6 attributes the lowest GVA at approximately £65billion. Income deprivation is averaged at 26%, below an SDC average of 27.05%. Those receiving job seekers allowance is high, comparative to other SDCs, at 2%. This is above an SDC average of 1.68%.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 6 will benefit to a slight extent relative to other SDCs through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 6 will increase by an additional £45.9bn and there will be an 342k jobs. This represents a large beneficial effect relative to other SDCs.

Overall, **large beneficial** effects are anticipated for SDC 6 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Local-Reg	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. There are 28 Local Authorities in this SDC, which is mid-sized relative to the areas of other SDCs. Full beneficial effects, though, may not be experienced in the short term. Note that co-ordination with authorities in Scotland would also be required in relation to this SDC.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. Cross border cooperation may be more difficult to achieve, so only slight beneficial effects are anticipated.

Long Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. Cross border cooperation may be more difficult to achieve, so only slight beneficial effects are anticipated.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 13. Close coordination with authorities in Scotland required under this SDC.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen rail connectivity in the economic development corridor along the North East. There are currently capacity, timetabling and reliability constraints along the corridor. Therefore, connecting these areas together, when they had previously poor connectivity, will open up the potential job opportunities and access to services. This would be particularly beneficial to those communities who currently do not have good access to jobs, faith centres or social care services. Sheffield City Region has the highest proportions of black and minority ethnic populations across the SDC (15%). Furthermore, Tees Valley has the highest percentage of people in the most income deprived areas in this SDC, followed closely by have above average percentage of DLA claimants for the North. In SDC 6 26% of people are in highest income deprivation quintile; this is slightly lower than the 28% average across the North.

Medium Term: As the infrastructure develops, connecting a greater number of areas within Sheffield, Newcastle, Leeds and other key areas on the east coast may become stronger and offer a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. When strengthening the connectivity between the areas it is important to consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, such as increased levels of traffic increasing the level of perceived severance. Any impacts, such as increased air pollution levels, as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Strengthening the rail connectivity between the east coast areas could enable a wider range of people to access a number of services, such as healthcare. It could also create a mode shift from car to rail, and therefore reduce the number of cars on the roads, improving air quality in some areas. This could have positive impacts in areas with high deprivation, such as areas in North East LEP. 8% of people in the North East LEP are in bad and very bad health; this is higher than other areas in the North. 7% of those in Sheffield City Region and Tees Valley are in bad and very bad health. The average life expectancy for those living in the LEPs in SDC 6 is in line with the average in the North, but slightly above that of England. North East and Tees Valley have the lowest life expectancies across the corridor.

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. If this is by promoting rail services as opposed to road, this could have a mode shift effect, and therefore positive health effects associated with a reduction in air pollution.

Long Term: As with the medium term, there will be the potential benefits and negative effects of widening the number of services accessible to people and possibly increasing the attractiveness of rail to create a mode shift from car to rail.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air pollution levels as a result of road enhancement schemes, need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Redevelopment and improved integration of stations have the potential to improve the perception of community safety and reduce the fear of crime. Leeds City Region, Tees Valley and North East LEP have the highest crime rates in the SDC corridor and some of the highest crime rates in the North. Leeds City Region has the highest crime rate in the whole of the North.

Medium Term: It is anticipated that more upgrades to stations and other user facilities, creating a modern travelling environment, would improve perceived community safety.

Long Term: As with the medium term, more enhancements are likely to reduce perceived level of fear of crime.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. When improving interchanges, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is important to consider the local areas when looking at improving interchanges; areas with the highest crime deprivation would benefit most from increased perception of community safety.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between manufacturing and research centres across the North could create a number of job opportunities for a wider range of people especially increased with previously poor connectivity. Tees Valley and North East have some the highest levels of income deprivation in the North. Whereas North Yorkshire has the lowest income deprivation levels in the North.

Medium Term: Infrastructure to connect the major employment areas, could improve employment levels in a wider range of areas. Tees Valley LEP has the highest levels of people claiming Job Seekers Allowance in the North (3%), compared to 2% in Sheffield and Leeds City Region, North East and Humber. 1% of people in North Yorkshire are claiming Job Seekers Allowance.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas. It could also help reduce income deprivation in many areas with more affordable transport options increasing access to a great number of jobs, community centres and social care services.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure information is disseminated effectively to the public, making a particular effort to ensure timetabling and ticket price information is available to lower income groups, older people and disabled people. Promotional materials need to use uncomplicated language and information, in order to ensure the information is understandable for all.

New transport provision should be priced in line with current transport options.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There are no specific measures that will promote community safety or reduce perceived fear of crime. However, any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety. This could be particularly beneficial for women, black and minority ethnic populations and people with a disability as they maybe more susceptible to fear of crime. Leeds City Region, has a higher than average Black and Minority Ethnic populations, whilst Sheffield City Region, North East and Tees Valley have higher levels of disability living allowance claimants.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Med	0	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail could create a mode shift from car to rail. This would reduce the number of cars on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people.

Medium Term: As the infrastructure is implemented, a greater number of people may choose rail over car travel and therefore improve safety by reducing the number of cars on the road

Long Term: As with the medium term, any effects from the enhanced rail infrastructure could have long term beneficial effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should consider the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers. This is important when enhancing/building interchanges that may attracted and increased amount of traffic to the local area.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail, could create a mode shift from car to rail. This would reduce the number of cars on the road and therefore, reduce levels of perceived severance. This is especially important in dense urban areas where a high proportion of households do not have access to a car, also areas with high levels of children and areas of high levels of income deprivation. However, any enhanced or new interchanges which could attract an increased amount of traffic by the interchange, could increase levels of severance in the local area.

Medium Term: As the infrastructure developed in the medium term and enhances rail connections this could continue to reduce the number of cars on the road, especially in urban areas, and therefore, reduce perceived severance.

Long Term: There could be long term beneficial effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. There is a higher than average percentage of children in Tees Valley and Leeds City Region compared to the average across the North.

Medium Term: Any potential health effects from reduced traffic and therefore air and noise pollution can have medium term effects.

Long Term: Any potential health effects from reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity across the economic development corridor in the North East could create a number of job opportunities for a wider range of people especially increased with previously poor connectivity. Tees Valley has the second highest levels of income deprivation in the North. North East is slightly above average for the North, Leeds and Sheffield City Region are in line with the average for the North. North Yorkshire has significantly below average levels of income deprivation for the North. Therefore, improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those with high levels of income deprivation could be beneficial to health.

Medium Term: Infrastructure to connect the major employment areas, could improve employment levels in a wider range of areas. Tees Valley LEP has the highest levels of people claiming Job Seekers allowance in the North (3%), this is compared to 2% in Sheffield and Leeds City Region, North East and Humber. 1% of people in North Yorkshire are claiming Job Seekers Allowance.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation, which may also have high levels of health deprivation and disability. Tees Valley and North East LEP have some of the highest levels of health deprivation and disability in the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg-	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: Whilst the specific fare structure in unknown, improving the ease of connectivity could simplify the fare structure and therefore may improve affordability of these services. This is especially important for those in lower income groups as it could enable them to afford a wider range of transport options.

In Tees Valley, 39% of people are in areas with the highest level of income deprivation, for North East this is 32%. Humber, Sheffield and Leeds City Region 28%, 28% and 25% respectively. North Yorkshire, only have 7% of people in the areas with the highest level of income deprivation.

Medium Term: Affordable transport and consequently improved job opportunities could help reduce the income deprivation and overall deprivation of some of the most income deprived areas, within Tees Valley and North East LEP. It could also help reduce health deprivation and disability in a number of areas with more affordable transport options increasing access to a great number of services, such as health.

Long Term: It is anticipated, as with the medium term, more affordable travel options by enhanced connectivity will have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low-income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: There is a mention of investment in a number of station facilities in places such as Sunderland and Darlington. Any improvements/modernisation to interchanges and waiting facilities could have increase perceived community safety.

Medium Term: This could have an effect in the medium term, dependent on any enhancements to interchange/waiting facilities.

Long Term: As with medium term, dependant on the enhancements and maintenance of facilities there could be a perceived increase in community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail could create a mode shift from car to rail. This would reduce the number of cars on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people. Any improvements to stations could attract additional levels of cars, this could increase traffic in the local area and could consequently increase accidents.

Medium Term: As the infrastructure is implemented, a greater number of people may choose rail over car travel and therefore improve safety by reducing the number of cars on the road

Long Term: As with the medium affects, any affects from the enhanced rail infrastructure could have long term beneficial effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Measures to enhance safety for all road users should be central in the design of new infrastructure, this is especially important for local areas surrounding multi-modal interchanges – maximising the safety benefits for drivers, pedestrians and cyclists.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: Increasing the attractiveness of public transport as an option by making it easier and more efficient to travel by rail, could create a mode shift from car to rail. This would reduce the number of cars on the road and therefore, reduce levels of perceived severance. This is especially important in dense urban areas where a high proportion of households do not have access to a car, also areas with high levels of children and areas of high levels of income deprivation. However, any enhanced or new interchanges which could attract an increased amount of traffic by the interchange, could increase levels of severance in the local area.

Medium Term: As the infrastructure developed in the medium term and enhances rail connections this could continue to reduce the number of cars on the road, especially in urban areas, and therefore, reduce perceived severance.

Long Term: There could be long term beneficial effects on communities, especially for those in deprived areas or with high numbers of children and older people.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When introducing stations or transport corridors, it is important consider whether they are severing public right of ways and pedestrian footpaths as these may have an increase in perceived severance. Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance, particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✓	Local-Reg	MT-LT	Perm	Med	+	++	++	++

Commentary

Short Term: Any enhancements in public transport which could create a mode shift, could have beneficial effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. 7% of people in Greater Manchester, Lancashire and Sheffield City Region are in bad and very bad health, compared to 6% in Cumbria.

It is important to consider the health affects an increase in local traffic and therefore, air and noise pollution as a direct consequence of any enhanced/new train stations.

Medium Term: Any potential health effects from reduced traffic and therefore, air and noise pollution can have medium term effects.

Long Term: Any potential health effects from reduced traffic and therefore, air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children e.g. schools. Furthermore, people which have long term conditions, such as asthma will be particularly vulnerable in areas with increased air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport option for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: North Yorkshire, North East and Tees Valley have above average proportion of people killed or seriously injured across the North. Whereas, Humber, Sheffield City Region and Leeds City Region have below the average for the North. Public transport enhancements which could create a mode shift and reduce car km could have a beneficial impact on safety and reduce accidents. However, it is important to consider any increased traffic that new or enhanced rail stations may bring to the local area, this may have a negative impact on accidents in the vicinity close to the station.

Medium Term: There is a potential effect in the medium term dependent on the infrastructure implemented. However, this depends on the uptake of public transport.

Long Term: The long term effect is dependent on the specific enhancement to public transport corridors and the mode shift this creates.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important that any new interchanges are safely accessible to pedestrians.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	✓	Local-Reg	ST-MT	Perm	Low	+	+	+	+

Commentary

Short Term: Leeds City Region has the highest level of crime in the North, Tees Valley and North East also have high levels. Any improvements to infrastructure and interchanges that modernises them and increases the amount of people that use the interchanges which could increase informal surveillance and therefore, improve perceived security and this could also improve crime levels.

Medium Term: In the medium term, improved and modernised infrastructure on a larger scale could have a regional positive affect on crime levels and perceived community safety.

Long Term: There could be improved community safety in the long term with the enhancement of services being developed over a number of years, and the uptake taking a while to reach its full potential.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: No recommendations made.

H.9. SDC 7 Yorkshire to Scotland

H.9.1. SDC 7 Datasheet

Table H-15 SDC 7 Datasheet

ISA Topic	Sustainability feature	Parameters (No. / Area)	Percentage coverage	Per capita
Air Quality	AQMA	32	0.40	0.00150
Designated Sites	SAC	28	4.51	0.06043
	SPA	13	3.78	
	SSSI	394	5.48	
	NNR	15	0.47	
	LNR	179	0.22	
	Ramsar	6	1.47	
	WHS	3	0.30	0.00114
	EA Special Areas	6	N/A	-
	AONB	3	3.11	0.04958
	National Parks	2	9.96	
Water	Flood Zones	2163.66 km^2	12.95	0.04913
	Flood Risk Areas	131.4 km^2	0.79	0.00298
Landfill	Authorised Landfill Sites	251	0.26	0.00302
	Historic Landfill sites	2030	0.53	
Agriculture	Agricultural Land Grades	Grade 1: 207.76 km^2	1.24	-
		Grade 2: 2896.52 km^2	17.34	-
		Grade 3: 7862.89 km^2	47.06	-
		Grade 4: 1229.48km^2	7.36%	-
		Grade 5: 1417.88 km^2	8.49	-
		Urban: 996.39 km^2	5.96	-
		Non Agri: 440.42 km^2	2.64	-
Heritage	Listed Buildings	22679	N/A	-
	Registered Battlefields	12	0.18	0.00632
	Registered Parks and Gardens	106	1.06	
	Scheduled Monuments	2346	0.42	

Ancient Woodland	Ancient Woodlands	1947	N/A	-

H.9.2. SDC 7 Mapping

Figure H-54 SDC 7 - Agricultural Land Classifications

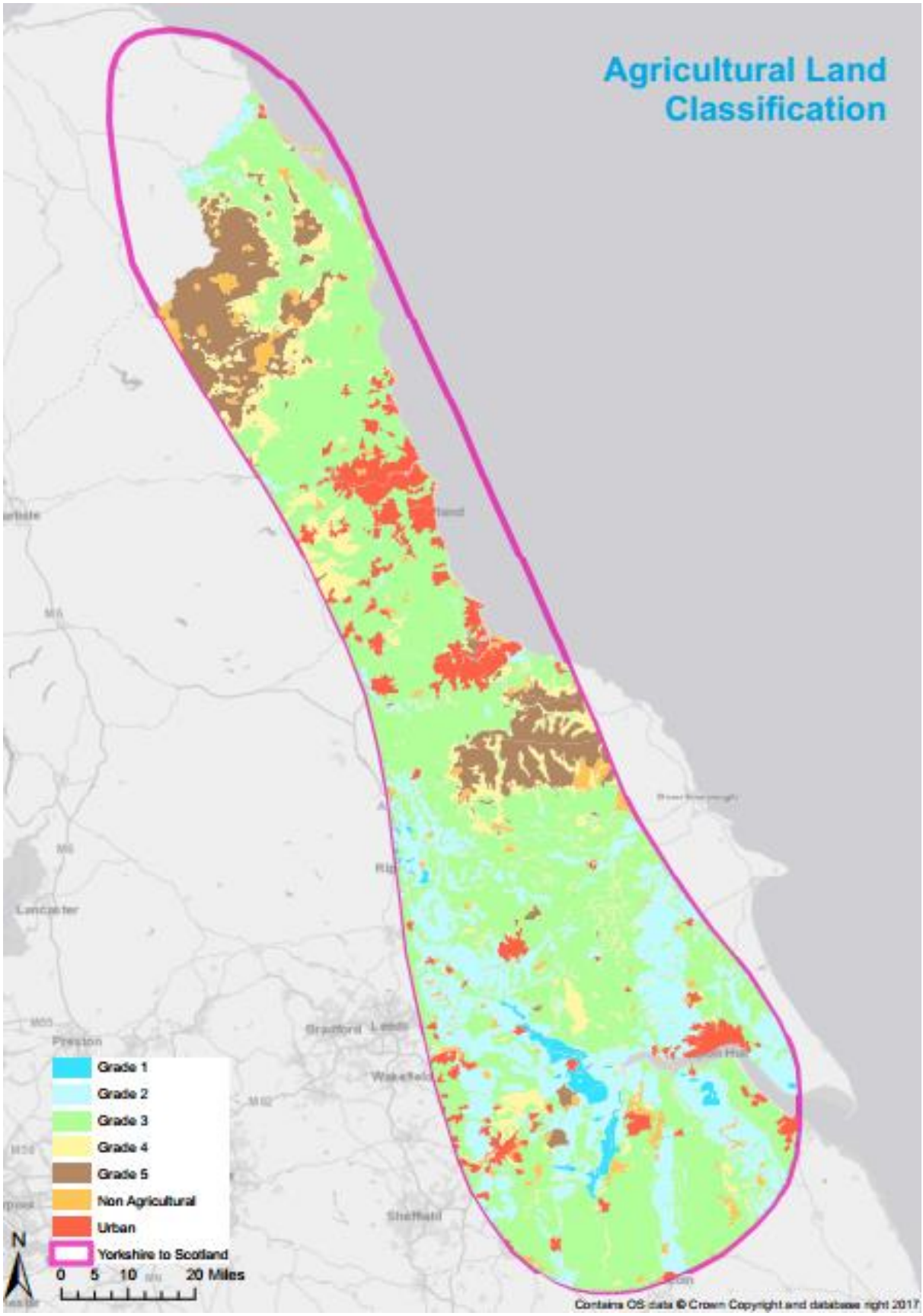


Figure H-55 SDC 7 - Air Quality Management Areas

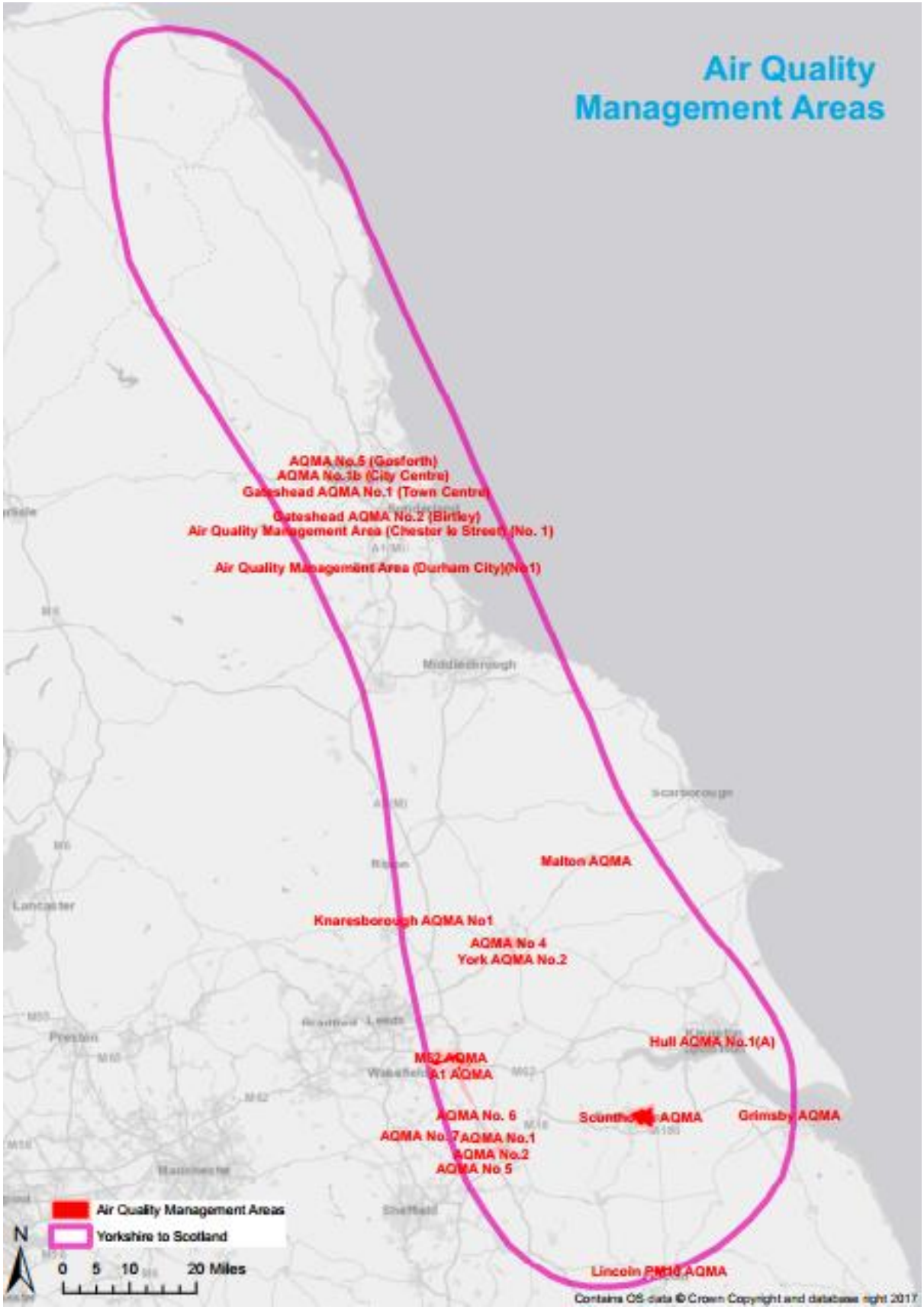


Figure H-56 SDC 7 - Ancient Woodland

Figure H-57 SDC 7 - Designated Sites

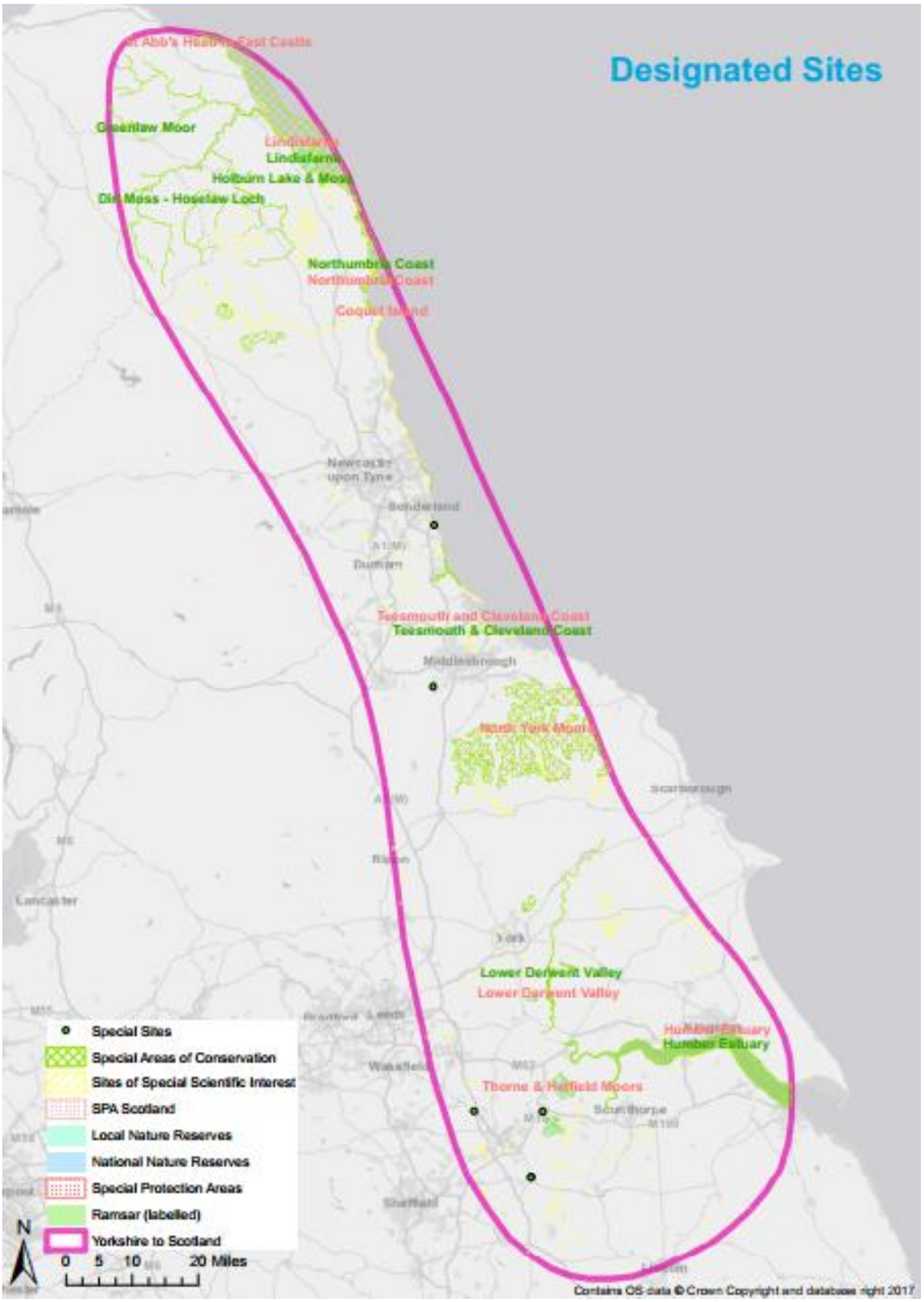


Figure H-58 SDC 7 - Heritage Sites

Figure H-59 SDC 7 - Historic and Authorised Landfill Sites

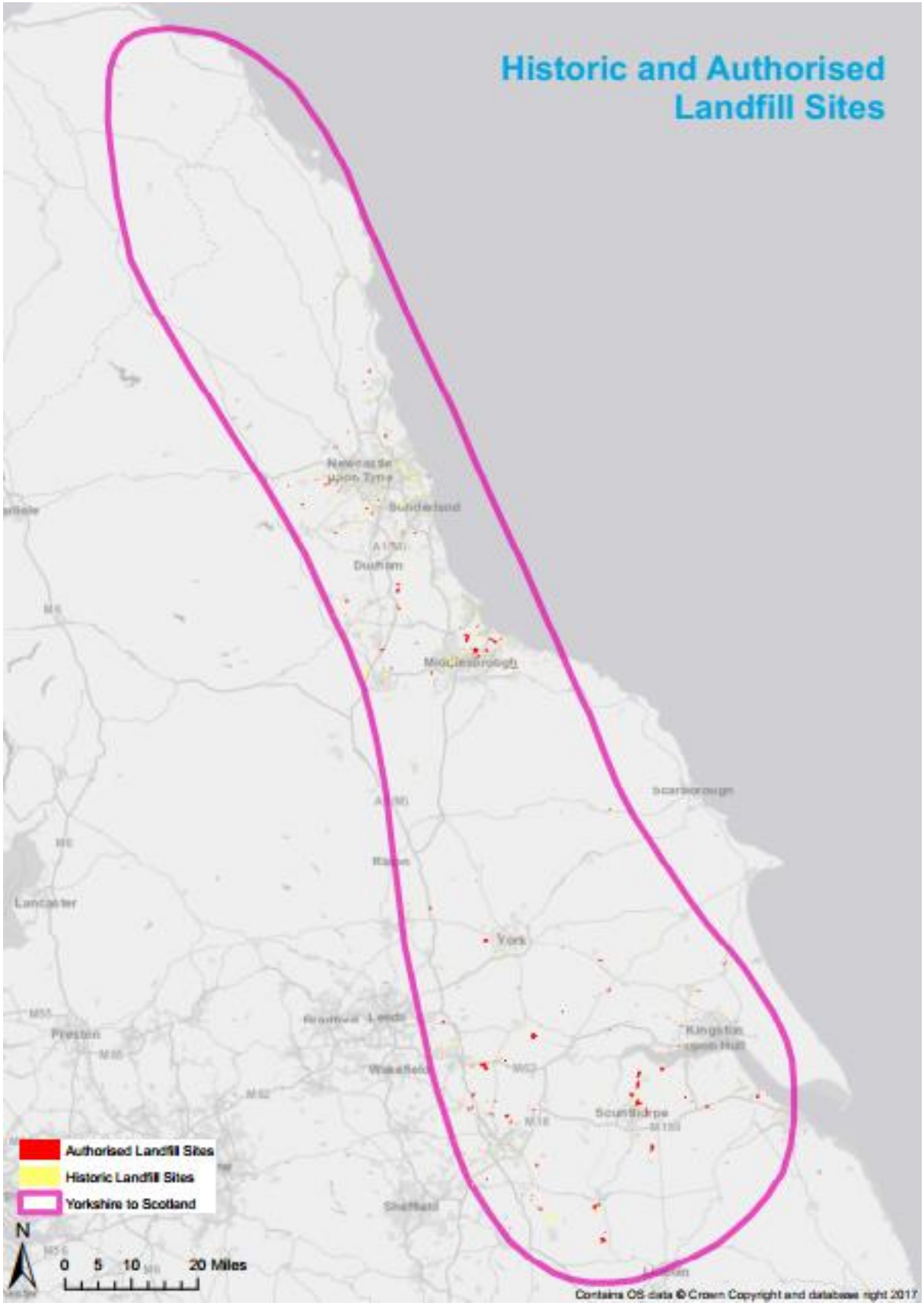
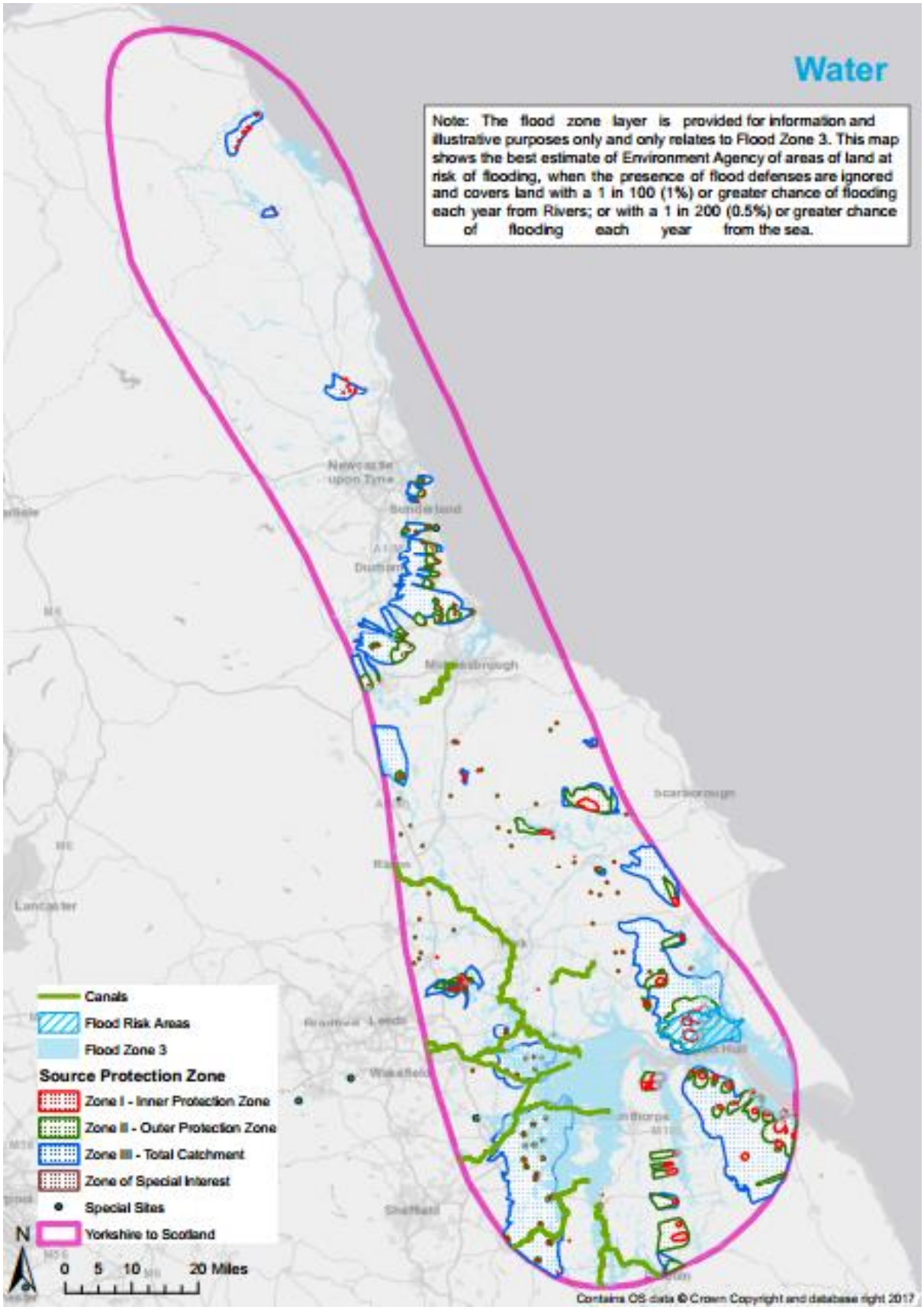


Figure H-60 SDC 7 - Landscape Designations

Figure H-61 SDC 7 - Water Features



H.9.3. SDC 7 Assessment Tables

Anticipated interventions in the 'Transformational' scenario relating to Strategic Development Corridor 7 - Yorkshire to Scotland (SDC 7) are as follows:

Assumed Intervention Types
Highways • New highway links • Highway infrastructure improvements **Enabling infrastructure** • EV facilitating • Smart/adaptive roads • Digital connectivity

Estimates of overall annual movement derived from TfN transport modelling, and associated estimated carbon emissions, have been categorised for SDC 7 relative to other SDCs for 2015, short term (2025), medium term (2035) and long term (2050). The results of this analysis, referenced in the assessment tables, are shown below.

MOVEMENT

Trip km Increase

	2015	2025	2035	2050
Rail	High	Low	Low	High
Road	Med	Low	Med	High

CARBON

CO_2e Increase (Red) / Decrease (Blue)

2015	2025	2035	2050
High	Low	Med	High
Med	Med	Low	High

Table H-16 Assessment of Strategic Development Corridors: SDC 7 – Yorkshire to Scotland

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Reduce greenhouse gas emissions from transport overall, with particular emphasis on road transport	✗	Reg-Nat	LT	Perm	High	--	-	-	-

Commentary

Short Term: Relative to other SDCs, SDC 7 has medium levels of GHG emissions from road sources and but high levels from rail. Overall, the majority of contributions within SDC 7 are from road based sources, with rail emissions growing at a low rate and road emissions growing at a medium rate over the short term. Effects are anticipated to be moderate adverse.

Medium Term: By 2035, carbon emissions from road are expected to show a low increase, while rail is anticipated to show medium growth. These trends are likely to be due to the uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be slight adverse.

Long Term: Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, but high growth in rail emissions. Road emissions decline is anticipated to be due to increased uptake of LZEVs and grid decarbonisation. Effects are anticipated to be slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 1.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Protect and enhance biodiversity, geodiversity and the green infrastructure network	✓/✗	Local	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: New transport interventions have the potential to impact on designated and non-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). However, opportunities could be provided for enhancement of biodiversity, for example through planting of native species. Protected areas account for approximately 2,560km^2, which is 15.33% of the total area of SDC 7. SDC 7 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. There is potential for some beneficial and adverse effects for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of interventions.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued moderate growth in road movement.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued relatively high growth in road movement.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, there would be a **mix of slight beneficial and adverse** effects.

Mitigation

Mitigation Measures: See Mitigation Table 2 and 3.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Conserve and enhance the international sites (HRA specific objective)	?	Local-Reg	ST-LT	Perm	Low	?	?	?	?

Commentary

Short Term: This SDC will include al range of potential road transport interventions, from which there is a potential for effects (positive and negative) for this ISA Objective from the new / upgraded infrastructure, depending upon the nature and location of potential interventions. This SDC is at **medium risk** relative to the other SDCs. Effects are anticipated to be uncertain.

Medium Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued medium growth in road movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Long Term: There is potential for both positive and negative effects, depending upon the nature and location of potential interventions, with some tendency towards negative effects given the sensitivity of assets and continued relatively high growth in both road and rail movement. However, the lack of detail on specific interventions means that anticipated effects are currently uncertain.

Overall, it is anticipated that, in relation to this ISA Objective in isolation, potential effects are currently **uncertain**.

Mitigation

Mitigation Measures: See Mitigation Tables 2 and 3. Also, Habitats Regulation Assessment process to be followed in relation to the development of interventions as required.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Protect and enhance air quality	✓/✗	Local-Reg	LT	Perm	High	--	--	+	-

Commentary

Short Term: Within this SDC the majority of travel is undertaken by road and this is anticipated to increase at a low rate relative to other SDCs. Rail travel is currently at a high rate in this SDC relative to other SDCs and while it is anticipated to increase, this will be at a low rate compared to other SDCs. Effects are anticipated to be moderate adverse.

Medium Term: Both road and rail travel increase during this time period (road at a medium rate and rail at a low level relative to other SDCs). During this period, there will also be a strong growth in LZEVs, though there is likely to still be low growth in emissions from road vehicles and continued growth in emissions from rail. Effects are anticipated to be moderate adverse.

Long Term: While road travel levels are anticipated to have increased at a high rate relative to other SDCs, by 2050 it is anticipated that a high proportion of vehicles will be LZEV. Rail travel will also have grown at a high rate relative to other SDC). Growth in LZEV use means emissions from road are anticipated to decrease at a high rate relative to other SDCs, but the growth in rail emissions will mean that effects on air quality are anticipated to be slight beneficial.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 4.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Increase resilience of the transport network to extreme weather events and a changing climate	✗	Local	MT-LT	Perm	Med	-	-	--	-

Commentary

Short Term: Within this SDC 2,163km^2 are located within Flood Zone 3, which makes up approximately 12.95% of the SDC area. SDC 7 is thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. New measures to increase resilience including, for example, SuDS, are being put in place under implemented interventions (including infrastructure upgrades).

Medium Term: Length of road at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 13% by the 2020s under a four degree Celsius average temperature increase scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. Medium levels of road growth, relative to other SDC, may make resilience more problematic to achieve and effects are anticipated to be slight adverse.

Long Term: By the 2050s the length of road at risk of flooding more frequently than 1:75 years (on average) is predicted to increase by 61% for railways under a four degree Celsius average temperature increase scenario and by 49% for road under this scenario. However, it is anticipated new design standards will take account of a changing climate and will be implemented on new / upgraded infrastructure and the uptake of measures such as SuDS will continue to cover a greater proportion of the SDC. However, this SDC has forecasted high levels of road and rail traffic growth and this could make resilience difficult to achieve. Effects are anticipated to be moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 5. At present 12.95% of the SDC is in Flood Zone 3 and measures would be required to address these areas in particular.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Protect and enhance the inland and coastal water environment	✓/✗	Local-Reg	MT-LT	Perm	Med	+	-	--	-

Commentary

Short Term: This SDC is located within the Northumbria (33.38% of the SDC), Solway Tweed (11.54% of the SDC) and Humber (55.08% of the SDC) River Basins, with the WFD ensuring there is a good understanding of water management and quality issues in each. For example, in Northumbria 4% of the River Basin is significantly impacted by pollution from towns, cities and transport.

Medium Term: Specific measures are being introduced under the WFD to address water pollution from the transport network, in particular from roads. The use of SuDS is also becoming a more common / standard element to road drainage design. The WFD anticipates that measures such as these will help improve water quality status in future and such measures are promoted under this STP. Medium levels of road growth, relative to other SDCs, may make protecting the water environment problematic to achieve and effects are anticipated to be slight adverse.

Long Term: It is anticipated that trends in increased rail use would increase further, along with WFD measures with resulting protection of the water environment. However, this SDC has forecasted high rates of road and rail traffic growth and this could make resilience difficult to achieve. Effects are considered moderate adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 6.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
7. Protect and conserve soil and remediate / avoid land contamination	✘	Local	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: There are a range of agricultural land classifications across SDC 7, with large areas known to be of Best and Most Versatile (BMV) types (i.e. Grades 1 – 3a). There are some small pockets of Grade 1 to the south west boundary of the corridor (to the west of Ripon), with larger areas in the Goole / Selby region. There are also large tracts of poorer upland areas of Grade 5 centred on the North York Moors and close to the border with Scotland. It is also worth noting that in this SDC are located the large urban conurbations of Newcastle Upon Tyne, Sunderland, Hull and the Tees Valley area. Within this SDC approximate percentages of agricultural grade land are 1.24% Grade 1 (low risk relative to other SDCs), 17.34% is Grade 2 (high risk relative to other SDCs), 47.06% Grade 3 (high risk relative to other SDCs), 7.36% Grade 4 (medium risk relative to other SDCs), and 8.49% Grade 5 (low risk relative to other SDCs), while 8.6% is classed as Urban or Non-Agricultural (medium risk relative to other SDCs). Within this SDC, there are six EA Special Sites identified, which are known to be contaminated. There are 251 Authorised Landfill sites (0.26% of the SDC area) and 2,030 Historic Landfill sites (0.53% of the SDC area). SDC 7 is considered at **low risk** relative to other SDCs in terms of high value agricultural land and known contamination.

Medium Term: In the medium term, agricultural land quality is anticipated to remain generally stable, with small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation.

Long Term: In the longer term, agricultural land quality is anticipated to continue to remain generally stable, with further small areas of loss due to encroaching transport infrastructure and other development. Ongoing contamination could continue from transport projects, though there would be opportunities for land remediation. There are expected to be relatively high rates of both road and rail growth in this SDC of low risk.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 7. Protection of soil resources, particularly those of higher quality / areas of better agricultural lands, should always be considered, especially those areas of Grade 1 to the west of Ripon and in the Goole / Selby area.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
8. Support the conservation and enhancement of the quality and distinctiveness of historic assets, industrial and cultural heritage and their settings.	✘	Local-Reg	ST-LT	Perm	Low	--	-	-	-

Commentary

Short Term: Of pre-eminence in cultural heritage terms within SDC 7 are the World Heritage Sites of Frontiers of the Roman Empire (Hadrian's Wall), Durham Castle and Cathedral and Studley Royal Park. It is anticipated that these sites will continue to receive the highest levels 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 STP aims to encourage archaeological investigation which will help aid understanding and there may be opportunities to enhance features, e.g. historic railway stations. Historic sites represent a total of about 1.71% of this SDC (285km^2). SDC 7 is

thus considered to be at **high risk** of negative effects against this ISA Objective, relative to other SDCs. Road and rail are expected to grow at low rates and it is anticipated this will result in moderate adverse effects.

Medium Term: Protection of the full range of known sites will continue and it is likely that new sites will join the list. Effects are anticipated to be slight adverse.

Long Term: 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 remain slight adverse.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 8. Of particular note in this SDC is the need to avoid the WHSs of Frontiers of the Roman Empire (Hadrian's Wall), Durham Castle and Cathedral and Studley Royal Park.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
9. Protect and enhance the character and quality of landscapes and townscapes	✗	Local-Reg	ST-LT	Perm	High	--	-	-	-

Commentary

Short Term: North York Moors National Park and three AONBs lie within the SDC 7 area. These AONBs have an area of about 519km^2 representing about 3.11% of this SDC. SDC 7 is thus considered to be at **medium risk** of negative effects against this ISA Objective, relative to other SDCs. At present, landscape and townscape within SDC 7 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, etc. In some instances, though, there would be potential for enhancement. But for the most part effects are anticipated to be moderate adverse.

Medium Term: Areas currently protected for their landscape would still receive that protection, but new interventions would still represent new features in the landscape and there is a medium risk to landscape in this SDC. However, screening would have reduced adverse effects. Effects are anticipated to be slight adverse

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 have reduced adverse effects. High growth rates for both road and rail movement are expected in this period.

Overall, **slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 9.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	✓/✗	Local-Reg	ST-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: Within this SDC it is estimated that total English local authority waste collected is 3,349,443 tonnes (0.76tonnes/capita). As an indication within this SDC of recycling rates, it is estimated that 57.83% of total SDC English LA collected waste is not sent for recycling, which are medium rates relative to other SDCs.

Medium Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 7 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there could still be issues relating to meeting recycling objectives in this SDC. Effects would be a mix of beneficial and adverse.

Long Term: Targets for the recovery of waste will require an increase in recycling rates across the SDC 7 area. Efforts to reach these targets would be considered slight beneficial, but it is anticipated that there will always be some waste that is not reused and as such there will be a mix of beneficial and adverse effects.

Overall, a mix of **slight beneficial and slight adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 10.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
11. Enhance lower carbon, affordable transport choice	✗✗	Reg-Nat	ST-LT	Perm	High	---	--	+	--

Commentary

Short Term: Highway interventions only are proposed under this SDC and while that would include EV facilitating which allow a lower carbon choice, overall highway construction would not be considered low carbon, at least in the short term. Relative to other SDCs, SDC 7 has medium levels of GHG emissions from road sources and high from rail. SDC 7 is thus considered to be at **medium priority** for this ISA Objective, relative to other SDCs.

Medium Term: A continued implementation of smart mobility technology, along with growing LZEV use, are anticipated to result in slight beneficial effects. However, by 2035, carbon emissions from road are expected to still show a low growth, as will rail. These trends are likely despite uptake of LZEVs and decarbonisation of the electrical grid. Effects are anticipated to be moderate adverse.

Long Term: Continued development of highway infrastructure would still encourage car use. However, there would be a greater uptake of LZEVs and smart mobility technology. While these would be lower carbon, they may have issues around affordability. Over the term to 2050, there is anticipated to be a large fall in carbon emissions from road based transport, though a large rise in rail. Effects are anticipated to be slight beneficial.

Overall, **moderate adverse** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 11.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
12. Enhance long term economic prosperity and promote economic transformation	✓✓	Local-Reg	ST-LT	Perm	High	+	+++	+++	+++

Commentary

Short Term: Over the short term key economic figures are anticipated to grow, with tax receipts by 2025 anticipated to be approximately £155 billion. This is anticipated to be aided through the interventions proposed under SDC 7. A number of inferences are also made through assessment of the constituent Local Enterprise Partnerships (LEPs) and derivation of economic indicators at SDC level. Comparative to other SDCs, and accounting for major intersecting LEPs only, SDC 7 attributes a below average GDV at

approximately £111billion. Income deprivation is averaged at 26.8%, above an SDC average of 27.05%. It is also inferred that those receiving job seekers allowance is also high, at 2%, equal highest with SDC 6.

Medium Term: Under a Transformational Scenario, it is anticipated that SDC 7 will benefit through providing greater access to job opportunities and by connecting the main economic centres.

Long Term: Under a Transformational Scenario, it is anticipated that the GVA of the SDC 7 area will increase by an additional £45.9bn and there will be an additional 342k jobs. This represents a large beneficial effect relative to other SDCs.

Overall, **large beneficial** effects are anticipated for SDC 7 in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 12.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
13. Coordinate land use and strategic transport planning across the region	✓	Local-Reg	ST-LT	Perm	High	+	+	+	+

Commentary

Short Term: At present, transport planning and land use planning across England are organised on a local / combined authority level and this would be the case for all the areas within this SDC. The result of this is that a co-ordination deficit has been identified relating to governance and funding approaches which have driven competitive behaviours in the short term and a move away from regional spatial planning has left a gap between integrated transport and spatial planning at the Pan-Northern level. It is the intention that this STP will plug this gap. There are 28 Local Authorities over this wide SDC area. This may make coordination more difficult to achieve relative to other SDCs. Full beneficial effects may not be experienced in the short term. Note that coordination with authorities in Scotland would be required in relation to this SDC.

Medium Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The wide area and need for cross border cooperation may make cooperation more difficult to achieve.

Long Term: It is anticipated that the introduction of a new strategic approach will result in more effective delivery of major infrastructure. The wide area and need for cross border cooperation may make cooperation more difficult to achieve.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 13.

Recommendations: Close coordination with authorities in Scotland required under this SDC.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	✓	Local-Reg	MT-LT	Perm	Med	+	+	+	+

Commentary

Short Term: This SDC aims to strengthen road connectivity between the east coast corridor and Scotland. Connecting these areas together will open up the potential job opportunities and access to services. This would be particularly beneficial to those communities who currently do not have good access to jobs, faith centres or social care services. Sheffield City Region has the highest proportions of black and minority ethnic populations across the SDC (15%). Furthermore, Tees Valley has the highest percentage of people in the most income deprived areas in this SDC, and also has an above average percentage of DLA claimants for the North. In SDC 7 26% of people are in highest income deprivation quintile; this is slightly lower than the 28% average across the North.

Medium Term: As the infrastructure develops, connecting a greater number of areas within Sheffield, Newcastle, Leeds and other key areas on the east coast may become stronger and offer a larger range of services and jobs to different areas.

Long Term: As with the medium-term, benefits will be increased when sufficient infrastructure is increased.

Overall, **slight beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 14. When strengthening the connectivity between the areas it is important to consider the needs of different communities and make sure that the distribution of connectivity enhancements and access is proportionate between a range of areas. Communities need to be considered when there are any improvements to road infrastructure which may have negative effects, such as increased levels of traffic increasing the level of perceived severance. Any impacts, such as increased air pollution levels as a result of road enhancement schemes, need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	✓	Local-Reg	MT-LT	Perm	Low	+	++	++	++

Commentary

Short Term: Strengthening the road connectivity between on the east coast and Scotland could enable a wider range of people to access a number of services, such as healthcare. However, this could attract a larger number of people to travel by car, reducing air quality in some areas. This could have negative impacts in areas with high deprivation, such as areas in North East LEP. 8% of people in the North East LEP are in bad and very bad health; this is higher than other areas in the North. 7% of those in Sheffield City Region and Tees Valley are in bad and very bad health. The average life expectancy for those living in the LEPs in SDC 7 is in line with the average in the North, but slightly above that of England. North East and Tees Valley have the lowest life expectancies across the corridor.

Medium Term: Any infrastructure or measures that are developed to enhance connectivity for both people and goods can have medium term impacts on health. However, when this is promoting increased road connections, especially in urban areas, this could have negative health effects associated with an increase in air pollution.

Long Term: As with the medium term, there will be the potential benefits and negative effects of enhancing road connections. This could enable people to access a number of jobs and healthcare services more easily. However, there could potentially be an increase in air and noise pollution as a direct result of enhanced road connections.

Overall, **moderate beneficial** effects are anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15. Any impacts on health, such as increased air quality levels as a result of road enhancement schemes need to be fully assessed so that any necessary localised mitigation such as noise barriers can be suggested.

ISA Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
16. Promote community safety and reduce crime and fear of crime for all citizens (CSA specific objective)	✓/✗	Local-Reg	MT-LT	Perm	Low	+/-	+/-	+/-	+/-

Commentary

Short Term: As this corridor is focussed on road improvements, it is considered that there could be beneficial effects in terms of new roads / road improvements built to the latest standards. There would also be adverse effects from the potential for road accidents to pedestrians and other road users. No aspects relating to crime or the fear of crime have been identified.

Medium Term: A mix of beneficial and adverse effects are anticipated to continue into the medium term.

Long Term: A mix of beneficial and adverse effects are anticipated to continue into the long term.

Overall, a **mix of slight beneficial and slight adverse** effects is anticipated in relation to this ISA Objective.

Mitigation

Mitigation Measures: See Mitigation Table 15.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity between areas in the North East could create a number of job opportunities for a wider range of people with previously poor connectivity. Tees Valley and North East have some the highest levels of income deprivation in the North. Whereas North Yorkshire has the lowest income deprivation levels in the North.

Medium Term: Infrastructure to connect the major employment areas, could improve employment levels in a wider range of areas. Tees Valley LEP has the highest levels of people claiming Job Seekers Allowance in the North (3%), this is compared to 2% in Sheffield and Leeds City Region, North East and Humber. 1% of people in North Yorkshire are claiming Job Seekers Allowance.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links. They should be positioned where they do not block access to services, such as health care services, or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This SDC is primarily aimed at road travel and is unlikely to have a large impact on affordability. However, increasing road connections and reducing the time taken for people to travel to various areas within the east coast could have beneficial impacts on affordability. Furthermore, any improvements in road connectivity, without equivalent options via public transport, could discriminate against households that do not have a car and that cannot afford to have a car.

In Tees Valley, 39% of people are in areas with the highest level of income deprivation, for North East this is 32%. Humber, Sheffield and Leeds City Region 28%, 28% and 25% respectively. In North Yorkshire, only have 7% of people in the areas with the highest level of income deprivation.

Medium Term: Enhanced road connectivity may have some improvements on affordability in the medium term.

Long Term: It is anticipated, there may be some impacts on affordability with improved road connectivity However, there is not likely to be a large impact.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Ensure information is disseminated effectively to the public, making a particular effort to ensure timetabling and ticket price information is available to lower income groups, older people and disabled people. Promotional materials need to use uncomplicated language and information, in order to ensure the information is understandable for all.

New transport provision should be priced in line with current transport options.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This SDC is likely to have very little impact on community safety.

Medium Term: This SDC is unlikely to have any potential future impact on community safety.

Long Term: This SDC is unlikely to have any potential future impact on community safety.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Any new or enhanced road corridors should have sufficient street lighting on footpaths and laybys to reduce fear of potential crime.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Enhancing road connectivity and therefore, increasing the attractiveness of travelling by car could increase the number of cars and HGVs on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people. Therefore, this could have a negative impact on accidents and incidents. Any new road corridors also have the potential to increase accidents.

Medium Term: If a greater number of people are attracted to road travel, as opposed to public transport, this could create increased numbers of road accidents.

Long Term: This has long term negative effects as a larger number of HGVs and cars on the road could lead to an increase in accidents in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: Safety measures should consider the needs of all transport users on the road network, including pedestrians and cyclists as well as car drivers/passengers.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Enhancing road connectivity, and therefore increasing the attractiveness of travelling by car, could increase the number of cars and HGVs on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people. Therefore, this could have a negative impact on perceived levels of severance. Any new road corridors also have the potential to increase levels of perceived severance, especially if they sever any PRoWs. Furthermore, perceived levels of severance could be increased in areas where a high number of households do not have access to a car.

Medium Term: If a greater number of people are attracted to road travel, as opposed to public transport, this could create increased levels of perceived severance.

Long Term: This has long term negative effects as a larger number of HGVs and cars on the road could lead to an increased level of perceived severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

EqIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Any enhancements in public transport which could create a mode shift or any support for the introduction of zero emission vehicles could have positive effects on noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. There is a higher than average percentage of children in Tees Valley and Leeds City Region compared to the average across the North.

Medium Term: Any potential health effects from reduced traffic, and therefore air and noise pollution, can have medium term effects.

Long Term: Any potential health effects from reduced air and noise pollution can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 14.

Recommendations: When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. school.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve accessibility to services, facilities and amenities for all	✓✓	Local-Reg	LT	Perm	Med	+	++	+++	++

Commentary

Short Term: Strengthening connectivity across the economic development corridor in the North East could create a number of job opportunities for a wider range of people especially increased with previously poor connectivity. Tees Valley has the second highest levels of income deprivation in the North. North East is slightly above average for the North, Leeds and Sheffield City Region are in line with the average for the North. North Yorkshire has significantly below average levels of income deprivation for the North. Therefore, improving accessibility between economic centres and therefore opening up a wider range of jobs and services to those with high levels of income deprivation could be beneficial to health.

Medium Term: Infrastructure to connect the major employment areas, could improve employment levels in a wider range of areas. Tees Valley LEP has the highest levels of people claiming Job Seekers allowance in the North (3%), this is compared to 2% in Sheffield and Leeds City Region, North East and Humber. 1% of people in North Yorkshire are claiming Job Seekers Allowance.

Long Term: Long term investment in connectivity between the densely populated areas could enhance connectivity over the long term, especially in areas with high levels of income deprivation, which may also have high levels of health deprivation and disability. Tees Valley and North East LEP have some of the highest levels of health deprivation and disability in the North.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations:

There is a need to ensure that any new transport interventions are thoroughly assessed for their air quality and noise impacts. Furthermore, it is important to consider the physical placement of new transport links, they should be positioned where they do not block access to services, such as health care services or obstruct access to open spaces. Information on proposals should be fully accessible for all (i.e. in a variety of formats, easy to read, audio description, and in a variety of languages to suit the local community, and at suitable venues).

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve affordability of transport	✓	Local-Reg	MT-LT	Perm	Low	+	+	+	+

Commentary

Short Term: This SDC is primarily aimed at road travel and is unlikely to have a large impact on affordability. However, increasing road connections and reducing the time taken for people to travel to various areas within the east coast could have beneficial impacts on affordability.

In Tees Valley, 39% of people are in areas with the highest level of income deprivation, for North East this is 32%. Humber, Sheffield and Leeds City Region 28%, 28% and 25% respectively. North Yorkshire, only have 7% of people in the areas with the highest level of income deprivation.

Medium Term: Enhanced road connectivity may have some improvements on affordability in the medium term.

Long Term: It is anticipated, there may be some impacts on affordability with improved road connectivity However, there is not likely to be a large impact.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: It is important travel is affordable to those in areas of high income deprivation areas, as well as areas with relatively low-income deprivation.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
3. Reduce crime and fear of crime and promote community safety	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary

Short Term: This SDC is primarily aimed at road travel and is unlikely to have a large impact on affordability. However, increasing road connections and reducing the time taken for people to travel to various areas within the east coast could have beneficial impacts on affordability.

In Tees Valley, 39% of people are in areas with the highest level of income deprivation, for North East this is 32%. Humber, Sheffield and Leeds City Region 28%, 28% and 25% respectively. North Yorkshire, only have 7% of people in the areas with the highest level of income deprivation.

Medium Term: Enhanced road connectivity may have some improvements on affordability in the medium term.

Long Term: It is anticipated there may be some impacts on affordability with improved road connectivity. However, there is not likely to be a large impact.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When improving interchanges and waiting facilities provision, it is important to ensure that the areas are well lit, have good visibility so that people are able to see any potential dangers, and where appropriate implement CCTV. It is also important to develop areas which will attract a large amount of people so there is an increase in informal surveillance.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
4. Improve road safety and reduce the number of accidents and other incidents	✗	Local-Reg	MT-LT	Perm	Med	-	--	---	--

Commentary

Short Term: Enhancing road connectivity, and therefore increasing the attractiveness of travelling by car, could increase the number of cars and HGVs on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people. Therefore, this could have a negative impact on accidents and incidents. Any new road corridors also have the potential to increase accidents.

Medium Term: If a greater number of people are attracted to road travel, as opposed to public transport, and as traffic levels rise, this could lead to an increased number of accidents on the road.

Long Term: Long term negative effects as a larger number of HGVs and cars on the road could lead to an increase in accidents in the long term.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Measures to enhance safety for all road users should be central in the design of new infrastructure. This is especially important for local areas surrounding multi-modal interchanges, maximising the safety benefits for drivers, pedestrians and cyclists.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
5. Reduce severance	✗	Local-Reg	MT-LT	Perm	Med	-	--	---	--

Commentary

Short Term: Enhancing road connectivity and therefore, increasing the attractiveness of travelling by car could increase the number of cars and HGVs on the road, especially in urban areas, which have high levels of pedestrians, cyclists, children and older people. Therefore, this could have a negative impact on perceived levels of severance. Any new road corridors also have the potential to increase levels of perceived severance, especially if they sever any PRoWs.

Medium Term: If a greater number of people are attracted to road travel, as opposed to public transport, and as traffic levels rise, this could create increased levels of severance.

Long Term: This has long term negative effects as a larger number of HGVs and cars on the road could lead to an increased level of severance.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: When introducing stations or transport corridors, it is important consider whether they are severing public right of ways and pedestrian footpaths as these may have an increase in perceived severance. Transport initiatives / routes should be placed sensitively to minimise the impact on (actual or perceived) severance, particularly for those most vulnerable to the impacts of severance, or those in more remote communities.

HIA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
6. Reduce environmental impacts of transport - vibration and air, noise and light pollution	✗	Local-Reg	MT-LT	Perm	Med	-	-	-	-

Commentary

Short Term: Any enhancements in road corridors or new corridors which attract new levels of HGVs and cars could negatively impact vibration levels, noise and air pollution. This is especially important in areas with a high proportion of children or those with health problems, such as asthma. People in Tees Valley have the highest percentage of people in bad and very bad health within the North.

Medium Term: Any potential health effects from increase traffic, and therefore air and noise pollution, can have medium term effects.

Long Term: Any potential health effects from increased traffic, and therefore air and noise pollution, can have long term effects.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Large road enhancements which will attract a significant increase in vehicles and HGV traffic through, densely populated urban areas, areas with high deprivation and those with high levels of children should be avoided or mitigated against.

When enhancing connectivity, it is important to consider urban areas in particular and income deprived areas. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Furthermore, children are particularly vulnerable to noise pollution therefore it is important to consider if the area has high levels of children or is near services that might have a high proportion of children, e.g. schools. Furthermore, people who have long term conditions such as asthma will be particularly vulnerable in areas with increased air pollution. It will be important to minimise the impact of transport on the environment and therefore transport initiatives should prioritise and focus on use of public transport options for people and goods movement.

In addition, it is assumed that construction/implementation of new transport services/routes will make use of suitable approaches to minimise noise, air quality and light pollutants.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
1. Improve road safety and reduce the number of accidents and other incidents	✗	Local -Reg	MT-LT	Perm	Low	-	-	-	-

Commentary

Short Term: North Yorkshire, North East and Tees Valley have above average proportion of people killed or seriously injured across the North. Whereas, Humber, Sheffield City Region and Leeds City Region have below the average for the North. Any road enhancement, likely to attract an increased number of cars or HGVs has the potentially to increase accidents and incidents on the road corridor.

Medium Term: There is the potential for this SDC to have negative effects in the medium term, as the uptake on enhanced road corridors increases the number of accidents.

Long Term: The long term effect is dependent on the specific increases in car and HGV levels and other public transport alternatives.

Mitigation / Recommendations

Mitigation Measures: See Mitigation Table 15.

Recommendations: Any new or enhanced road corridors should have safe pedestrian and cyclist crossing points.

CSA Sub-Objective	Effects					Assessment			
	Mag	Scale	Dur	T/P	Cert	ST	MT	LT	Sm
2. Improve actual and perceived safety and security issues	-	N/A	N/A	N/A	N/A	0	0	0	0

Commentary
Short Term: This SDC is likely to have very little impact on community safety.
Medium Term: This SDC is unlikely to have any potential future impact on community safety.
Long Term: This SDC is unlikely to have any potential future impact on community safety.
Mitigation / Recommendations
Mitigation Measures: See Mitigation Table 15.
Recommendations: Any new or enhanced road corridors should have sufficient street lighting on footpaths and laybys to reduce fear of potential crime.

Appendix I. Mitigation

I.1. Generic Mitigation Tables

Table I-1 Mitigation Table 1

Overview

Due to the potential threats posed by a changing climate and in order to meet Government commitments to reducing carbon emissions, measures should be taken to reduce the amount of carbon from our transport system. Reductions would mainly be from vehicles and can be found in many of the measures suggested to reduce air pollution emissions, but further reductions to the carbon footprint can be found in the construction and operation of transport network assets, for example by using more energy efficient lights. The carbon footprint can be readily measured at construction and operation by use of an appropriate carbon calculator.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A1. Consideration of GHG emitting potential in the selection of materials A2. High Occupancy Lanes and Cycle Lanes A3. Increase distances between traffic and sensitive receptors	B1. Methods to reduce carbon footprint during construction e.g. use by contractor of carbon calculator B2. Setting energy targets and monitoring performance B3. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C1. Management of vehicle speed C2. Encourage use of Low Emission Vehicles C3. Development and regular monitoring of KPIs C4. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C5. Implement a regular programme of maintenance and improvement
Highways – Infrastructure improvements		
A4. Consideration of GHG emitting potential in the selection of materials A5. High Occupancy Lanes and Cycle Lanes	B4. Methods to reduce carbon footprint during construction e.g. use by contractor of carbon calculator B5. Setting energy targets and monitoring performance B6. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C6. Management of Vehicle speed C7. Encourage use of Low Emission Vehicles C8. Development and regular monitoring of KPIs C9. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C10. Implement a regular programme of maintenance and improvement
Rail – New links		
A6. Consideration of GHG emitting potential in the selection of materials A7. Low emission engine technology trains A8. Increased electrification of the rail network	B7. Methods to reduce carbon footprint during construction, e.g. use by contractor of carbon calculator B8. Setting energy targets and monitoring performance B9. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C11. Development and regular monitoring of KPIs C12. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C13. Implement a regular programme of maintenance and improvement
Rail – Infrastructure improvements		
A9. Consideration of GHG emitting potential in the selection of materials	B10. Methods to reduce Carbon Footprint during construction, e.g. use by contractor of carbon calculator	C14. Development and regular monitoring of KPIs C15. Use of a carbon footprint calculator to monitor

A10. Low emission engine technology trains A11. Increased electrification of the rail network	B11. Setting energy targets and monitoring performance B12. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	performance and identify areas for improvement C16. Implement a regular programme of maintenance and improvement
Rail – Station upgrade		
A12. Consideration of GHG emitting potential in the selection of materials A13. Low emission engine technology trains A14. Increased electrification of the rail network	B13. Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator B14. Setting energy targets and monitoring performance B15. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C17. Development and regular monitoring of KPIs C18. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C19. Implement a regular programme of maintenance and improvement
Public transport (excl. rail) – Park and ride schemes		
A15. Consideration of GHG emitting potential in the selection of materials A16. Encourage further investment in low emission bus vehicles	B16. Methods to reduce carbon footprint during construction e.g. use by contractor of carbon calculator B17. Setting energy targets and monitoring performance B18. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C20. Management of vehicle speed C21. Encourage use of Low Emission Vehicles C22. Development and regular monitoring of KPIs C23. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C24. Implement a regular programme of maintenance and improvement
Public transport (excl. rail) – Station and interchange works		
A17. Consideration of GHG emitting potential in the selection of materials	B19. Methods to reduce carbon footprint during construction, e.g. use by contractor of carbon calculator B20. Setting energy targets and monitoring performance B21. Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C25. Management of vehicle speed C26. Encourage use of Low Emission Vehicles C27. Development and regular monitoring of KPIs C28. Use of a carbon footprint calculator to monitor performance and identify areas for improvement C29. Implement a regular programme of maintenance and improvement
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A18. Consideration of GHG emitting potential in the selection of materials	B22. Methods to reduce carbon footprint during construction e.g. use by contractor of carbon calculator B23. Setting energy targets and monitoring performance	C30. Development and regular monitoring of KPIs C31. Use of a carbon footprint calculator to monitor performance and identify areas for improvement

	B24.	Consideration of GHGs in Construction Environmental Management Plans (CEMPs)	C32.	Implement a regular programme of maintenance and improvement

Table I-2 Mitigation Table 2

Overview

Opportunities to enhance biodiversity and green infrastructure exist, through designing in biodiversity into schemes. These opportunities include for example, the development of wildflower meadows along linear features such as roads and railway lines, which will look attractive and also provide opportunities for pollinators, or could include simple measures such as bird / bat boxes. More complex measures such as animal over or under passes can be considered. Similarly, biodiversity can be enhanced by the planting of suitable / native species of trees and hedgerows. Properly planned maintenance schemes can also enhance biodiversity, for example from the active control of invasive species. Particular consideration needs to be made to protection measures in relation to any scheme which may impact directly, or indirectly, on any site designated for nature conservation purposes

Typical mitigation for type of intervention					
Design		**Construction**		**Operation and Maintenance**	
Highways – New links					
A19.	Consideration of the potential for ecological enhancement	B25.	Consideration of the timing of construction works in relation to ecological windows and legislative requirements.	C33.	Screening with native species
A20.	Compensatory green infrastructure - including development of 'Green Streets'	B26.	Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs)	C34.	Development of wildflower meadows along route alignment or at junction islands, etc.
A21.	Scheme realignment – particularly if designated areas may be effected	B27.	Appropriate management of invasive species where applicable	C35.	Animal under / over passes
				C36.	Installation of bird / bat boxes
				C37.	Scheduled control of invasive species where necessary
Highways – Infrastructure improvements					
A22.	Consideration of the potential for ecological enhancement	B28.	Consideration of the timing of construction works in relation to ecological windows and legislative requirements.	C38.	Screening with native species
A23.	Compensatory green infrastructure – including development of 'Green Streets'	B29.	Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs)	C39.	Development of wildflower meadows along route alignment
		B30.	Appropriate management of invasive species where applicable	C40.	Planting of junction islands etc with wildflowers
				C41.	Scheduled control of invasive species where necessary
Rail – New links					
A24.	Consideration of the potential for ecological enhancement	B31.	Consideration of the timing of construction works in relation to ecological windows and legislative requirements.	C42.	Planting of appropriate native species
A25.	Protect green corridors	B32.	Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs)	C43.	Animal over / under passes
				C44.	Consideration of installation of bird / bat boxes
				C45.	Consideration of planting of trees
				C46.	Scheduled control of invasive species where necessary
		B33.	Appropriate management of invasive species where applicable		

Rail – Infrastructure improvements		
A26. Consideration of the potential for ecological enhancement A27. Protect green corridors	B34. Consideration of the timing of construction works in relation to ecological windows and legislative requirements. B35. Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs) B36. Appropriate management of invasive species where applicable	C47. Planting of appropriate native species C48. Animal over / under passes C49. Consideration of installation of bird / bat boxes C50. Consideration of planting of trees C51. Scheduled control of invasive species where necessary
Rail – Station upgrade		
A28. Consideration of the potential for ecological enhancement	B37. Consideration of the timing of construction works in relation to ecological windows and legislative requirements. B38. Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs) B39. Appropriate management of invasive species where applicable	C52. Consideration of installation of bird / bat boxes C53. Consideration of planting of trees C54. Scheduled control of invasive species where necessary
Public transport (excl. rail) – Park and ride schemes		
A29. Consideration of the potential for ecological enhancement	B40. Consideration of the timing of construction works in relation to ecological windows and legislative requirements. B41. Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs) B42. Appropriate management of invasive species where applicable	C55. Scheduled control of invasive species where necessary
Public transport (excl. rail) – Station and interchange works		
A30. Consideration of the potential for ecological enhancement	B43. Consideration of the timing of construction works in relation to ecological windows and legislative requirements. B44. Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs) B45. Appropriate management of invasive species where applicable	C56. Consideration of installation of bird / bat boxes C57. Consideration of planting of trees C58. Scheduled control of invasive species where necessary
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested

Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A31. Consideration of the potential for ecological enhancement A32. Appropriate mitigation anticipated to be incorporated into scheme design	B46. Consideration of the timing of construction works in relation to ecological windows and legislative requirements. B47. Consideration of biodiversity and designated sites and habitats in Construction Environmental Management Plans (CEMPs) B48. Appropriate management of invasive species where applicable	C59. Scheduled control of invasive species where necessary

Table I-3 Mitigation Table 3

Overview

Particular consideration needs to be made to protection measures in relation to any scheme which may impact directly, or indirectly, on any site designated for nature conservation purposes – particularly those designated as SSSI or Natura 2000 (SPA and SAC) and Ramsar sites. When necessary Habitats Regulation Assessment needs to be carried out.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New Links		
A33. Undertake Habitats Regulation Assessment (HRA) A34. Scheme realignment – particularly if designated areas may be effected A35. Consider incorporating pollution prevention measure into the design	B49. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C60. Implement a management programme which aligns with the findings of the HRA.
Highways – Infrastructure improvements		
A36. Undertake Habitats Regulation Assessment (HRA) A37. Consider incorporating pollution prevention measure into the design	B50. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA.	C61. Implement a management programme which aligns with the findings of the HRA
Rail – New links		
A38. Undertake Habitats Regulation Assessment (HRA) A39. Scheme realignment – particularly if designated areas may be effected A40. Consider incorporating pollution prevention measure into the design	B51. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C62. Implement a management programme which aligns with the findings of the HRA

Rail – Infrastructure improvements		
A41. Undertake Habitats Regulation Assessment (HRA) A42. Scheme realignment – particularly if designated areas may be effected A43. Consider incorporating pollution prevention measure into the design	B52. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C63. Implement a management programme which aligns with the findings of the HRA
Rail – Station upgrade		
A44. Undertake Habitats Regulation Assessment (HRA) A45. Consider incorporating pollution prevention measure into the design	B53. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C64. Implement a management programme which aligns with the findings of the HRA
Public transport (excl. rail) – Park and ride schemes		
A46. Undertake Habitats Regulation Assessment (HRA) A47. Scheme relocation – particularly if designated areas may be effected A48. Consider incorporating pollution prevention measure into the design	B54. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA.	C65. Implement a management programme which aligns with the findings of the HRA.
Public transport (excl. rail) – Station and interchange works		
A49. Undertake Habitats Regulation Assessment (HRA) A50. Consider incorporating pollution prevention measure into the design	B55. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C66. Implement a management programme which aligns with the findings of the HRA
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A51. Undertake Habitats Regulation Assessment (HRA) A52. Consider incorporating pollution prevention measure into the design	B56. Development and Implementation of a detailed Construction Environmental Management Plan (CEMP) that addresses the specific requirements of affected designated sites and aligns with the findings of the HRA	C67. Implement a management programme which aligns with the findings of the HRA

Table I-4 Mitigation Table 4

Overview

It will be important to reduce emissions and protect air quality as much as possible. Mitigation measures may affect the project design, layout, construction, operation and/or may comprise measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and speed control. The implementation of mitigation measures may require working with partners to support their delivery.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and maintenance**
Highways – New links		
A53. High Occupancy Lanes and Cycle Lanes A54. Increase distances between traffic and sensitive receptors A55. Consideration of the impact of the scheme on Air Quality Management Areas and potential scheme realignment if necessary. A56. Identify the potential for schemes may have a beneficial impact on Air Quality Management Areas	B57. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B58. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	C68. Management of vehicle speed C69. Encourage use of Low Emission Vehicles
Highways – Infrastructure improvements		
A57. High Occupancy Lanes and Cycle Lanes A58. Increase distances between traffic and sensitive receptors A59. Consideration of the impact of the scheme on Air Quality Management Areas and potential scheme realignment if necessary. A60. Identify the potential for schemes may have a beneficial impact on Air Quality Management Areas	B59. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B60. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	C70. Management of vehicle speed C71. Encourage use of Low Emission Vehicles
Rail – New links		
A61. Low emission engine technology trains A62. Increased electrification of the rail network	B61. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B62. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	
Rail – Infrastructure improvements		
A63. Low emission engine technology trains A64. Increased electrification of the rail network	B63. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B64. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	

Rail – Station upgrade		
A65. Low emission engine technology trains A66. Increased electrification of the rail network	B65. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B66. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	
Public transport (excl. rail) – Park and ride schemes		
A67. Increase distances between traffic and sensitive receptors A68. Consideration of the impact of the scheme on Air Quality Management Areas and potential scheme realignment if necessary. A69. Identify the potential for schemes to have a beneficial impact on Air Quality Management Areas	B67. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B68. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	
Public transport (excl. rail) – Station and interchange works		
	B69. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B70. Use of best practice construction techniques to minimise the impact on air quality, e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A70. Examine potential to increase distances between sites and sensitive receptors. A71. Consideration of the impact of the scheme on Air Quality Management Areas and potential scheme realignment if necessary. A72. Identify the potential for schemes may have a beneficial impact on Air Quality Management Areas	B71. Consideration of air quality in Construction Environmental Management Plans (CEMPs). B72. Use of best practice construction techniques to minimise the impact on air quality e.g. ensuring all plant and machinery are well maintained and not emitting excessive fumes	

Table I-5 Mitigation Table 5

Overview

Flooding poses a particular risk to the transport network and this situation is likely to get worse with a changing climate. However, new infrastructure developments or improvements to existing infrastructure can also contribute to an additional flood risk elsewhere. Opportunities can be taken to lower flood risk by considering flood protection measures, improving flow routes, flood storage capacity and using Sustainable Drainage Systems (SuDS). The appropriate use of SuDS will be critical and it should be the intention that site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts. Infrastructure should only be located in flood zones when there is no other option.

Typical mitigation for type of intervention					
Design		**Construction**		**Operation and maintenance**	
Highways – New links					
A73.	Careful route selection – avoid flood areas if possible	B73.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs).	C72.	Use of SuDS (sized to allow for a changing climate)
A74.	Design to consider flood protection measures, flow routes and flood storage capacity	B74.	Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff		
Highways – Infrastructure improvements					
A75.	Design to consider flood protection measures, flow routes and flood storage capacity	B75.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs).	C73.	Use of SuDS (sized to allow for a changing climate)
		B76.	Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff		
Rail – New links					
A76.	Careful route selection – avoid flood areas if possible	B77.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs).	C74.	Use of SuDS (sized to allow for a changing climate)
A77.	Design to consider flood protection measures, flow routes and flood storage capacity	B78.	Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff		
Rail – Infrastructure improvements					
A78.	Design to consider flood protection measures, flow routes and flood storage capacity	B79.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs).	C75.	Use of SuDS (sized to allow for a changing climate)
		B80.	Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff		
Rail – Station upgrade					
A79.	Explore opportunities for use of SuDS	B81.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs).	C76.	Use of SuDS (sized to allow for a changing climate)

		B82.	Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff		
Public transport (excl. rail) – Park and ride schemes					
A80.	Consideration of potential for flooding in design	B83. B84.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff	C77.	Use of SuDS (sized to allow for a changing climate)
Public transport (excl. rail) – Station and interchange works					
A81.	Consideration of potential for flooding in design	B85. B86.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMP'). Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff	C78.	Use of SuDS (sized to allow for a changing climate)
Enabling Infrastructure – EV facilitating					
Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested	
Enabling Infrastructure – Smart / adaptive roads					
Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested	
Enabling Infrastructure – Digital connectivity					
Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested		Minor works anticipated - no mitigation suggested	
Waterways – Inland and coastal port upgrades and canals					
A82.	Consider flow attenuation during design	B87. B88.	Consideration of storm water runoff and dewatering operations in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the impact on flooding, e.g. use of temporary SuDs features to control site runoff	C79.	Use of SuDS (sized to allow for a changing climate)

Table I-6 Mitigation Table 6

Overview
Impact on local water resources can be addressed through planning and design for the efficient use of water, including water recycling. Consideration should be given to the use of SuDS (including permeable paving), but it is also recognised that conventional drainage will play an important role. Protection and good pollution control measures are to be utilised during both construction and operation of transport schemes.

Typical mitigation for type of intervention					
Design		**Construction**		**Operation and Maintenance**	
Highways – New links					
A83.	Explore opportunities for use of SuDS	B89. B90.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C80.	Use of SuDS and/or conventional pollution control techniques such as petrol interceptors
Highways – Infrastructure improvements					
A84.	Explore opportunities for use of SuDS	B91. B92.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C81.	Use of SuDS and/or conventional pollution control techniques such as petrol interceptors
Rail – New links					
A85.	Explore opportunities for use of SuDS	B93. B94.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C82.	Use of SuDS and/or conventional pollution control techniques
Rail – Infrastructure Improvements					
A86.	Explore opportunities for use of SuDS	B95. B96.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C83.	Use of SuDS and/or conventional pollution control techniques
Rail – Station upgrade					
A87. A88.	Consideration of the use of greywater systems in buildings Explore opportunities for use of SuDS	B97. B98.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C84.	Use of SuDS and/or conventional pollution control techniques
Public transport (excl. rail) – Park and ride schemes					
A89.	Explore opportunities for use of SuDS	B99. B100.	Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C85.	Use of SuDS and/or conventional pollution control techniques such as petrol interceptors

Public transport (excl. rail) – Station and interchange works		
A90. Consideration of the use of greywater systems in buildings A91. Explore opportunities for use of SuDS	B101. Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs). B102. Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C86. Use of SuDS and/or conventional pollution control techniques such as petrol interceptors
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A92. Consideration of the use of greywater systems in buildings A93. Explore opportunities for use of SuDS	B103. Consideration of water quality and pollution in Construction Environmental Management Plans (CEMPs) B104. Use of best practice construction techniques to minimise the likelihood of a pollution incident occurring	C87. Use of SuDS and/or conventional pollution control techniques such as petrol interceptors

Table I-7 Mitigation Table 7

Overview

Protection of soil resources, particularly those of higher quality / areas of better agricultural lands should always be considered – this could be done during scheme planning by careful route selection. If areas of good quality soil cannot be avoided, care should be taken during construction to store topsoil for later reuse – either on site as landscaping or further afield. Opportunities should also be taken to utilise areas of previously developed land and to remediate contaminated land when possible. This could include the removal / appropriate treatment of any invasive species such as Japanese Knotweed.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and maintenance**
Highways – New links		
A94. Careful route selection – avoid areas of better quality soils if possible and target previously used land	B105. Remediation of contaminated land B106. Removal of invasive species B107. Care of topsoil for future reuse B108. Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) B109. Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C88. Scheduled control of invasive species where necessary C89. Encourage the use of low emission vehicles

Highways – Infrastructure improvements					
		B110. B111. B112. B113. B114.	Remediation of contaminated land Removal of invasive species Care of topsoil for future reuse Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C90. C91.	Scheduled control of invasive species where necessary Encourage the use of low emission vehicles
Rail – New links					
A95.	Careful route selection – avoid areas of better quality soils if possible and target previously used land	B115. B116. B117. B118. B119.	Remediation of contaminated land Removal of invasive species Care of topsoil for future reuse Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C92.	Scheduled control of invasive species where necessary
Rail – Infrastructure improvements					
A96.	Careful route selection – avoid areas of better quality soils if possible and target previously used land	B120. B121. B122. B123. B124.	Remediation of contaminated land Removal of invasive species Care of topsoil for future reuse Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C93.	Scheduled control of invasive species where necessary
Rail – Station upgrade					
		B125. B126. B127. B128. B129.	Remediation of contaminated land Removal of invasive species Care of topsoil for future reuse Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C94.	Scheduled control of invasive species where necessary
Public transport (excl. rail) – Park and ride schemes					
		B130. B131. B132. B133. B134.	Remediation of contaminated land Removal of invasive species Care of topsoil for future reuse Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) Use of best practice construction techniques to prevent the spread	C95. C96.	Scheduled control of invasive species where necessary Encourage the use of low emission vehicles

	of contamination when working with contaminated material	
Public transport (excl. rail) – Station and interchange works		
	B135. Remediation of contaminated land B136. Removal of invasive species B137. Care of topsoil for future reuse B138. Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) B139. Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C97. Scheduled control of invasive species where necessary C98. Encourage the use of low emission vehicles
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	B140. Remediation of contaminated land B141. Removal of invasive species B142. Care of topsoil for future reuse B143. Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) B144. Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A97. Careful route selection – avoid areas of better quality soils if possible and target previously used land	B145. Remediation of contaminated land B146. Removal of invasive species B147. Care of topsoil for future reuse B148. Consideration of contaminated spoil in Construction Environmental Management Plans (CEMPs) B149. Use of best practice construction techniques to prevent the spread of contamination when working with contaminated material	C99. Scheduled control of invasive species where necessary C100. Encourage the use of low emission vehicles

Table I-8 Mitigation Table 8

Overview
The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora. Heritage assets may be buildings, monuments, sites, places, areas or landscapes. Consideration should be made of the character and setting of the heritage asset, its significance (and level of protection afforded to it), the potential for loss or harm and need for conservation. Opportunities should be taken when possible for the enhancement of heritage assets. It should

also be noted that due to its nature, not all heritage features may be apparent at the planning / design stage and precautions for unexpected discovery should be taken – perhaps through an archaeological watching brief.		
Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A98. Consideration of character, setting, level of protection and potential need for conservation during planning and design A99. Consideration of opportunities for enhancement of known features of industrial & cultural heritage significance	B150. Precautions for unexpected heritage discovery during construction B151. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B152. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Highways – Infrastructure improvements		
A100. Consideration of character, setting, level of protection and potential need for conservation during planning and design A101. Consideration of opportunities for enhancement of known features of industrial & cultural heritage significance	B153. Precautions for unexpected heritage discovery during construction B154. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B155. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Rail – New links		
A102. Consideration of character, setting, level of protection and potential need for conservation during planning and design A103. Consideration of opportunities for enhancement of known features of industrial & cultural heritage significance	B156. Precautions for unexpected heritage discovery during construction B157. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B158. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Rail – Infrastructure improvements		
A104. Consideration of character, setting, level of protection and potential need for conservation during planning and design	B159. Precautions for unexpected heritage discovery during construction B160. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B161. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Rail – Station upgrade		
A105. Consideration of character, setting, level of protection and potential need for conservation during planning and design		

Public transport (excl. rail) – Park and ride schemes		
A106. Consideration of character, setting, level of protection and potential need for conservation during planning and design	B162. Precautions for unexpected heritage discovery during construction B163. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B164. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Public transport (excl. rail) – Station and interchange works		
A107. Consideration of character, setting, level of protection and potential need for conservation during planning and design	B165. Precautions for unexpected heritage discovery during construction B166. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	
Enabling Infrastructure – EV facilitating		
A108. As part of planning, ensure that the EV charging points do not affect any listed / historic building etc. e.g. by being incongruous with the historic building façade. Move the location if this is a potential. A109.	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A110. Consideration of character, setting, level of protection and potential need for conservation during planning and design A111. Consideration of opportunities for enhancement of known features of industrial and cultural heritage significance	B167. Precautions for unexpected heritage discovery during construction B168. Potential need for archaeological watching brief during construction – particularly in areas not previously developed B169. Consideration of unexpected heritage discovery in Construction Environmental Management Plans (CEMPs)	

Table I-9 Mitigation Table 9

Overview
Projects need to be designed carefully, taking account of the potential impact on the landscape. Reducing the scale of a project or making changes to its operation can help to avoid or mitigate the visual and landscape effects of a proposed project. Consideration during planning should also be given to appropriate siting, design of the scheme (including choice of materials) and landscaping schemes. Note that ideally native species should be used in any planting. Subject to appropriate planning, screening can also take place 'off site', e.g. by planting out gaps in tree lines / hedgerows. Particular consideration is to be given to conserving landscape and

scenic beauty in any nationally designated areas, with encouragement given to avoiding these areas if possible. Opportunities for landscape enhancement should be taken when possible.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A112. Careful route selection, especially in rural areas – particular protection to nationally designated areas required, with avoidance if possible A113. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used A114. Consideration of potential opportunities for landscape enhancement	B170. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Highways – Infrastructure improvements		
A115. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used A116. Opportunities to improve townscape, e.g. through decluttering of signage to be considered during design	B171. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Rail – New links		
A117. Careful route selection, especially in rural areas – particular protection to nationally designated areas required, with avoidance if possible A118. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used	B172. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Rail – Infrastructure improvements		
A119. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used	B173. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Rail – Station upgrade		
A120. Consideration during planning / design to choice of materials used	B174. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	

Public transport (excl. rail) – Park and ride schemes		
A121. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used	B175. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Public transport (excl. rail) – Station and interchange works		
A122. Consideration during planning / design to landscaping and screening, with care taken in choice of materials and species used	B176. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	
Enabling Infrastructure – EV facilitating		
A123. Consideration during Planning / Design to precise location of the EV charging point with care taken in choice of materials	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A124. Consideration during planning / design to landscaping and screening. Note this could also include off site screening from particularly sensitive viewpoints.	B177. Use of best practice construction techniques and Construction Environmental Management Plan (CEMP) to ensure that the character and quality of landscapes and townscapes are maintained as far as practical during construction	

Table I-10 Mitigation Table 10

Overview

Consideration during design and construction of transport schemes should be given to the waste hierarchy of prevention, reuse, recycling and disposal. All waste should be handled in accordance to applicable waste management legislation and the emphasis should be to minimise the volume of waste produced and the volume sent for disposal, unless it can be demonstrated that this is the best environmental outcome. Consideration should be given to the use of recycled materials in construction.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A125. Sustainable design measures	B178. Consideration of waste hierarchy and use of recycled or re-used materials in a Site	C101. Encourage the use of electric vehicles

	Waste Management Plan (SWMP)	
Highways – Infrastructure improvements		
A126. Sustainable design measures	B179. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	C102. Encourage the use of electric vehicles
Rail – New links		
A127. Sustainable design measures	B180. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	
Rail – Infrastructure improvements		
A128. Sustainable design measures	B181. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	
Rail – Station upgrade		
A129. Sustainable design measures	B182. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	C103. Development and regular monitoring of KPIs in relation to waste minimisation and use of natural resources
Public transport (excl. rail) – Park and ride schemes		
A130. Sustainable design measures	B183. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	C104. Encourage the use of electric vehicles
Public transport (excl. rail) – Station and interchange works		
A131. Sustainable design measures	B184. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	C105. Development and regular monitoring of KPIs in relation to waste minimisation and use of natural resources
Enabling Infrastructure – EV facilitating		
A132. Sustainable design measures	B185. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	B186. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested

Waterways – Inland and coastal port upgrades and canals		
A133. Sustainable design measures	B187. Consideration of waste hierarchy and Use of recycled or re-used materials in a Site Waste Management Plan (SWMP)	C106. Encourage the use of electric vehicles

Table I-11 Mitigation Table 11

Overview

Congestion can be reduced in numerous ways. Examples include new junctions and highway improvements, though these measures often only provide short term fixes. Therefore, it is important that aspects such as Smart Infrastructure and Managed Highways and, importantly, the development of more sustainable and active modes (such as cycling and walking) are pursued. Improved communities, with better streetscapes and people friendly streets, may also encourage people to leave their cars, thereby reducing road traffic / congestion. A further key component will be the full integration of bus and rail services to increase accessibility to the transport system.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A134. Bus priority measures, the provision of high-occupancy lanes A135. Cycle lanes (if highway type appropriate) A136. Ensure adequate footpaths (if highway type appropriate)		C107. Implement a regular programme of maintenance to facilitate the promotion of more active modes of travel
Highways – Infrastructure Improvements		
A137. Bus priority measures, the provision of high-occupancy lanes A138. Cycle lanes (if highway type appropriate) A139. Ensure adequate footpaths (if highway type appropriate)		C108. Implement a regular programme of maintenance to facilitate the promotion of more active modes of travel
Rail – New links		
Rail – Infrastructure improvements		
Rail – Station upgrade		
A140. Provision of secure cycle storage		C109. Implement a regular programme of maintenance to facilitate the promotion of more active modes of travel to / from stations
Public transport (excl. rail) – Park and ride schemes		

Public transport (excl. rail) – Station and interchange works		
Enabling Infrastructure – EV facilitating		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Smart / adaptive roads		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Enabling Infrastructure – Digital connectivity		
Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested	Minor works anticipated - no mitigation suggested
Waterways – Inland and coastal port upgrades and canals		
A141. Consider potential for integration with the rail network		

Table I-12 Mitigation Table 12

Overview

It is vital that the transport network provides and, where possible, improves the access to employment opportunities and effectively connects business areas with residential areas. Connectivity between business and residential centres and key infrastructure such as airports is a major consideration to be made, as is connectivity between urban centres across the region. Issues such as the attractiveness of the region as a better place to live and work can also influence and enhance inward investment or tourism and thereby increase employment opportunities across the region.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A142. Consideration of economic growth at route option selection stage	B188. Provide employment opportunities to unskilled / apprentices at construction stage	C110. Implement a plan of maintenance and improvement to ensure that the connectivity to commercial / economic centres are maintained
Highways – Infrastructure improvements		
	B189. Provide employment opportunities to unskilled / apprentices at construction stage	C111. Implement a plan of maintenance and improvement to ensure that the connectivity to commercial / economic centres are maintained
Rail – New links		
A143. Consideration of economic growth at route option selection stage	B190. Provide employment opportunities to unskilled / apprentices at construction stage	C112. Implement a plan of maintenance and improvement to ensure that the connectivity to commercial / economic centres are maintained
Rail – Infrastructure improvements		
A144. Explore potential commercial opportunities at planning stage	B191. Provide employment opportunities to unskilled / apprentices at construction stage	C113. Implement a plan of maintenance and improvement to ensure that the connectivity to commercial / economic centres are maintained

Rail – Station upgrade		
A145. Explore potential commercial opportunities at planning stage	B192. Provide employment opportunities to unskilled / apprentices at construction stage	
Public transport (excl. rail) – Park and ride schemes		
	B193. Provide employment opportunities to unskilled / apprentices at construction stage	C114. Implement a plan of maintenance and improvement to ensure that the connectivity to commercial / economic centres are maintained
Public transport (excl. rail) – Station & Interchange works		
A146. Explore potential commercial opportunities at planning stage	B194. Provide employment opportunities to unskilled / apprentices at construction stage	
Enabling Infrastructure – EV facilitating		
	B195. Provide employment opportunities to unskilled / apprentices at construction stage	
Enabling Infrastructure – Smart / adaptive roads		
	B196. Provide employment opportunities to unskilled / apprentices at construction stage	
Enabling Infrastructure – Digital connectivity		
	B197. Provide employment opportunities to unskilled / apprentices at construction stage	
Waterways – Inland and coastal port upgrades and canals		
	B198. Provide employment opportunities to unskilled / apprentices at construction stage	

Table I-13 Mitigation Table 13

Overview		
All of the proposed schemes will require adherence to the relevant planning requirements for any development in the region. As such, consideration of these requirements will be made at the design stage of all relevant schemes.		
Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A147. Consideration of design in relation to land use plans and planning requirements.		

Highways – Infrastructure improvements			
A148.	Consideration of design in relation to land use plans and planning requirements.		
Rail – New links			
A149.	Consideration of design in relation to land use plans and planning requirements.		
Rail – Infrastructure improvements			
A150.	Consideration of design in relation to land use plans and planning requirements.		
Rail – Station upgrade			
A151.	Consideration of design in relation to land use plans and planning requirements.		
Public transport (excl. rail) – Park and ride schemes			
A152.	Consideration of design in relation to land use plans and planning requirements.		
Public transport (excl. rail) – Station and interchange works			
A153.	Consideration of design in relation to land use plans and planning requirements.		
Enabling Infrastructure – EV facilitating			
A154.	Consideration of design in relation to land use plans and planning requirements.		
Enabling Infrastructure – Smart / adaptive roads			
A155.	Consideration of design in relation to land use plans and planning requirements.		
Enabling Infrastructure – Digital connectivity			
A156.	Consideration of design in relation to land use plans and planning requirements.		
Waterways – Inland and coastal port upgrades and canals			
A157.	Consideration of design in relation to land use plans and planning requirements.		

Table I-14 Mitigation Table 14

Overview
During the planning and design stages of any transport scheme, it is vital that consideration is given to the need for access to key public services such as health, education community and leisure facilities by all members of society. Access should be considered in relation to all modes, with an emphasis on more active and sustainable types. Affordability should also be a key consideration, with a

particular emphasis placed on effects on lower income groups. It should also be a priority to enhance access to key services for vulnerable groups.		
Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A158. Introduction of footpaths and cycle lanes (if nature of carriageway allows) A159. Consider potential for severance from key public services, or opportunities to improve access		C115. Implement a plan of maintenance and improvement to ensure that footpaths and cycle lanes remain an attractive option
Highways – Infrastructure improvements		
A160. Introduction of footpaths and cycle lanes (if nature of carriageway allows) A161. Consider potential for severance from key public services – or opportunities to improve access		C116. Implement a plan of maintenance and improvement to ensure that footpaths and cycle lanes remain an attractive option
Rail – New links		
A162. Consider potential for severance from key public services – or opportunities to improve access		C117. Regular reviews of ticket pricing / consideration of affordability
Rail – Infrastructure improvements		
		C118. Regular reviews of ticket pricing / consideration of affordability
Rail – Station upgrade		
Public transport (excl. rail) – Park and ride schemes		
A163. Consider potential for severance from key public services – or opportunities to improve access A164. See suggested mitigation for reduction in emissions		
Public transport (excl. rail) – Station and interchange works		
A165. Consider potential for severance from key public services – or opportunities to improve access A166. See suggested mitigation for reduction in emissions		
Enabling Infrastructure – EV facilitating		
Enabling Infrastructure – Smart / adaptive roads		
Enabling Infrastructure – Digital connectivity		

Waterways – Inland and coastal port upgrades and canals		

Table I-15 Mitigation Table 15 – Mitigation / Recommendations Relating to Health, Well-being and Community Safety

Overview

The consideration of health, well-being and community safety is critical as part of scheme planning and design and should include the introduction of the most modern and effective safety measures where proportionate**.** Safety considerations should apply to the construction phase, as well as when the transport infrastructure is operational. It should always be the consideration to minimise the risk of deaths or injury arising from the scheme and contribute to an overall improvement in societal safety levels. Consideration during scheme planning and design also has to be given to reducing emissions and other aspects such as noise, vibration dust, light pollution and severance which potentially effect health and well-being. Access to public services (health, education, community facilities etc.) is also another key consideration. Where appropriate, there should be an education programme to explain new technologies, digital services and automated vehicles etc. to ensure people feel secure and confident in their use. Liaison with relevant community services, hospitals, education centres, etc. should also be undertaken as appropriate. People should also be able to feel secure and safe, and design should always consider the need to reduce / prevent crime.

Typical mitigation for type of intervention		
Design	**Construction**	**Operation and Maintenance**
Highways – New links		
A167. Ensure scheme is designed to latest H&S standards A168. Consideration to reducing noise and vibration impacts through design, e.g. use of noise barriers or low noise road surfacing, in particular near to sensitive receptors A169. Consideration during design to be given to issue of community severance A170. High Occupancy Lanes and Cycle Lanes A171. Increase distances between traffic and sensitive receptors	B199. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B200. Adherence to all relevant health and safety measures	
Highways – Infrastructure improvements		
A172. Ensure scheme is designed to latest H&S standards A173. Consideration to reducing noise and vibration impacts through design, e.g. use of noise barriers or low noise road surfacing, in particular near to sensitive receptors A174. Consideration during design to be given to issue of community severance A175. High Occupancy Lanes and Cycle Lanes A176. Increase distances between traffic and sensitive receptors	B201. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B202. Adherence to all relevant health and safety measures	
Rail – New links		
A177. Ensure scheme is designed to latest H&S standards A178. Consideration to reducing noise and vibration impacts through design, e.g. use of noise barriers, in particular near to sensitive receptors	B203. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP	

A179. Low emission engine technology trains A180. Increased electrification of the rail network	B204. Adherence to all relevant health and safety measures	
Rail – Infrastructure improvements		
A181. Ensure scheme is designed to latest H&S standards A182. Consideration to reducing noise and vibration impacts through design, e.g. use of noise barriers, in particular near to sensitive receptors A183. Low emission engine technology trains A184. Increased electrification of the rail network	B205. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B206. Adherence to all relevant health and safety measures	
Rail – Station upgrade		
A185. Low emission engine technology trains A186. Increased electrification of the rail network	B207. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B208. Adherence to all relevant health and safety measures	
Public transport (excl. rail) – Park and ride schemes		
A187. Encourage further investment in low emission bus vehicles	B209. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B210. Adherence to all relevant health and safety measures	
Public transport (excl. rail) – Station and interchange works		
	B211. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B212. Adherence to all relevant health and safety measures	
Enabling Infrastructure – EV facilitating		
	B213. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B214. Adherence to all relevant health and safety measures	
Enabling Infrastructure – Smart / adaptive roads		
Enabling Infrastructure – Digital connectivity		

Waterways – Inland and coastal port upgrades and canals		
	B215. Use of best practice construction techniques to minimise annoyance and nuisance during construction, e.g. in relation to noise. This should be addressed in a CEMP B216. Adherence to all relevant health and safety measures	

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