

Strategic Transport Projects Review (STPR2) Consultancy Support Services Contract



STRATEGIC TRANSPORT PROJECTS REVIEW

PROTECTING OUR CLIMATE
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Strategic Environmental Assessment (SEA) Environmental Report

January 2022

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ABBREVIATIONS	
AQMA	Air Quality Management Area
AST	Appraisal Summary Table
CO ₂	Carbon dioxide
CRWIA	Child Rights and Wellbeing Impact Assessment
EqIA	Equalities Impact Assessment
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
HES	Historic Environment Scotland
HRA	Habitats Regulations Appraisal
ICIA	Island Communities Impact Assessment
IIP	Infrastructure Investment Plan
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transport System
MaaS	Mobility as a Service
NLEF	National Low Emission Framework
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NPF4	National Planning Framework 4
NSA	National Scenic Area
NTS	National Transport Strategy
PfG	Programme for Government
PM _{2.5}	Particulate Matter of Diameter Less Than or Equal to 2.5 microns (µm)
PM ₁₀	Particulate Matter of Diameter Less Than or Equal to 10 microns (µm)
PPS	Plans, Programmes and Strategies
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SIMD	Scottish Indices of Multiple Deprivation
SO ₂	Sulphur dioxide

ABBREVIATIONS	
SPA	Special Protection Area
STAG	Scottish Transport Appraisal Guidance
STPR	Strategic Transport Projects Review
SSSI	Site(s) of Special Scientific Interest
TPO	Transport Planning Objective
WFD	Water Framework Directive

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Active Travel Hubs	Specific locations which support/provide a base for active travel initiatives in a local community
Air Quality Management Area (AQMA)	A non-permanent designation created if monitoring reveals that statutory air quality thresholds are being exceeded or will be exceeded in the near future.
Appraisal Summary Table (AST)	These provide a high-level summary of the appraisal performance of each Grouping in a format which is quick and easy to interpret
Assessment	An umbrella term for description, analysis, and evaluation.
Baseline	The existing conditions which form the basis or start point of the environmental assessment
Biodiversity	Biological diversity, or richness of living organisms present in representative communities and populations.
Community Severance	Community severance is defined here as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows.
Conservation Area	Area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. Designated under section 61 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
Consultation Authorities	Refers to the three statutory Consultation Authorities in Scotland: Historic Environment Scotland, NatureScot and the Scottish Environment Protection Agency
Cultural heritage resource	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest
Cumulative effects	Scottish SEA Guidance (2013) states that ‘Cumulative effects can be considered in terms of synergistic effects, additive impacts and secondary effects.’ For the purposes of this SEA, the term ‘cumulative effects’ also encompasses synergistic and secondary effects.
Detailed Options Appraisal	The third stage of the STAG process, which involves quantitative assessment. The end output of this is a series of recommendations for future investment. This will be informed by more detailed and quantified appraisal of the option groupings so far as is practicable at this stage, and consideration of packages of groupings e.g. multi-modal or geographically based packages. The framework for detailed appraisal has been developed through the spring and summer of 2021.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Ecosystem	A biological community of organisms interacting with one another and their physical environment.
Effect	The result of change or changes on specific environmental resources or receptors.
Environmental Impact Assessment (EIA)	The process by which information about the environmental effects of a project is evaluated and mitigation measures are identified.
Environmental Report	An Environmental Report presents the findings of the SEA undertaken for a project
European Site	Otherwise known as ‘Natura 2000’ sites. These include Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC) and Special Protection Areas (SPAs) designated under the Birds Directive (2009/147/EEC). In addition, Candidate and Possible SACs, Potential SPAs and Ramsar wetlands (designated under the Convention on Wetlands of International Importance) should be included in appraisals as they are afforded the same level of protection as European sites under domestic policy. Natura 2000 sites are designated due to the presence of specific habitats and species of internationally important biodiversity value, otherwise known as ‘qualifying interest features.’
Grouping	<p>A collection of similar transport interventions under a common theme or region. Groupings were established to:</p> <ul style="list-style-type: none"> Allow similar options to be collated together to provide a more manageable list for further appraisal; Collate similar options across regions, thus aiding consistency in definition and appraisal; and, where appropriate Allow options that may, on their own merit, not be considered strategic, however when grouped address the identified national and regional Problems and Opportunities.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities, as used, for example in a Phase 1 Habitat Survey.
Habitat fragmentation	Describes the breaking up of an organism’s preferred environment/habitat. Occurs naturally through long-term geological processes, or through human activities, such as change of land use or infrastructure development.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Habitats Regulations Appraisal	Under the Habitats Regulations, all competent authorities must consider whether any plan or project will have a 'likely significant effect' on a European site. If so, they must carry out carry out an 'appropriate assessment' (AA). This is known as Habitats Regulations Appraisal (HRA).
Habitats Directive	EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
Hydrological	The exchange of water between the atmosphere, the land and the oceans.
Infrastructure Investment Plan (IIP)	Scottish Government document which sets out why there is a need to invest, how the Scottish Government invests and what strategic, large scale investments are intended to be taken forwards within each sector over the next 10 to 20 years.
Initial Appraisal: Case for Change	The first stage of the STAG process which demonstrates the rationale for intervention. The end output of this is a Sifted List of options. This process is informed by problems and opportunities, development of transport planning objectives, option generation and development, and sifting. Due to the scale of options being considered by STPR2, the sifted list of options are grouped together to form 'option groupings' of a similar type or nature. Draft Initial Appraisal: Case for Change reports for STPR2 were published in February 2020 (Transport Scotland (2021a)). Due to an enforced pause to the programme as a result of the COVID-19 pandemic, the draft reports were subsequently updated to reflect the impacts that the pandemic was having on people's travel behaviour. The updated reports were re-published in February 2021 and incorporated the outcomes from the option sifting and development processes.
Land Capability for Agriculture (LCA)	Land Capability for Agriculture (LCA) is derived from data published by The James Hutton Institute (2010) and its primary objective is to rank land based on its potential productivity and cropping flexibility determined by the extent to which its physical characteristics impose long term restrictions on its agricultural use.
Land Capability for Forestry (LCF)	Land Capability for Forestry (LCF) describes the potential for land to grow trees based on a number of factors including soil, climate and topography. The seven classes of LCF range from Class F1 (land with excellent flexibility for the growth and management of tree crops) to Class F7 (land unsuitable for producing tree crops.)
Landscape	Human perception of the land, conditioned by knowledge and identity with a place.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Land-take	Acquired land which is necessary to construct the project and associated infrastructure and to undertake the essential environmental mitigation measures.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories are A-C.
Local Landscape Character Area (LLCA)	An area outlined as having distinct characteristics based on landscape features. Derived from regional landscape studies available from NatureScot.
Low Emission Zone (LEZ)	Low emission zones set an environmental limit on certain road spaces, allowing access to only the cleanest vehicles and can help to transform towns and cities into cleaner, healthier places to live, work and visit. The development of these zones are one part of a range of actions that will help make our transport system cleaner, greener and healthier. Scotland's first LEZ, which only applies to buses, was introduced in Glasgow at the end of 2018. LEZs to improve air quality are to be introduced across Glasgow, Edinburgh, Dundee and Aberdeen between February 2022 and May 2022 and then into all other AQMAs by 2023 where the National Low Emission Framework (NLEF) appraisals show this is the correct mitigation.
MaaS	MaaS is a type of service that through a joint digital channel enables users to plan, book, and pay for multiple types of mobility services (e.g. bus and train journeys). The concept describes a shift away from privately-owned transport modes and towards mobility provided as a service. This is enabled by combining transportation services from public and private transportation providers through a unified gateway that creates and manages the trip, Users can pay per trip or a monthly fee for a limited distance. The key concept behind MaaS is to tailor the transport service to traveller needs.
Mitigation	Measure to avoid, reduce or offset potential adverse impacts.
Natural Capital	Natural Capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things. It is from this natural capital that humans derive a wide range of services, often called ecosystem services, which make human life possible.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Net Zero	Net zero refers to achieving a balance between the amount of greenhouse gas emissions produced and the amount removed from the atmosphere. There are two different routes to achieving net zero, which work in tandem: reducing existing emissions and actively removing greenhouse gases.
Net Zero Targets	Scotland has net-zero greenhouse gas emissions target for 2045 and an interim 2030 target to reduce emissions by 75% compared to 1990 levels. This covers all greenhouse gas emissions.
Non-motorised users	Pedestrians, cyclists, wheel chair users and equestrians.
Non-prime land	Agricultural land of Land Capability for Agriculture (LCA) classes 3.2 to 7.
Open space	Any land laid out as public parks or used for the purpose of public recreation, or land which is a disused burial ground.
Option Grouping	The 'option groupings' terminology has been adopted to refer to an intermediate stage in the option development process to support a proportionate appraisal of options through the Preliminary Appraisal stage. The option groupings have been identified based on consolidating a broad number of similar options and are designed to drive consistency in the appraisal of the significant number of options that remain following the Option Sifting stage (i.e. the Sifted Options List).
Option Sifting	Option Sifting is a process that should be undertaken when an unmanageably large number of options have been generated or where there is general consensus that a particular option or options generated will clearly not achieve the intended objectives or meet the identified transport problems and/or opportunities. The approach or basis for sifting options should be agreed with decision-makers.
Packaging	In STAG, packaging of transport options should be used to support achievement of the desired transport outcomes. By effectively packaging option groupings, this can reinforce, extend or complement the option grouping's impact, mitigate potential adverse impacts or increase the public acceptability of an option grouping. This has been considered in the detailed appraisal.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Place	The Place Principle recognises that: Place is where people, location and resources combine to create a sense of identity and purpose and is at the heart of addressing the needs and realising the full potential of communities. Places are shaped by the way resources, services and assets are directed and used by the people who live in and invest in them. A more joined-up, collaborative, and participative approach to services, land and buildings, across all sectors within a place, enables better outcomes for everyone and increased opportunities for people and communities to shape their own lives.
Positive effects for biodiversity	Net positive effects on biodiversity that would be likely to result from a development. This terminology is taken from the Planning (Scotland) Act 2019.
Potential Effect	The effect on an aspect of the environment that may occur in the absence of mitigation.
Preliminary Appraisal	The second stage of the STAG process which involves qualitative assessment. The end output of this is a Short List of options. In this stage, STPR2 option groupings are subject to further consideration against the STPR2 TPOs, the five STAG criteria of Environment, Safety, Economy, Integration, Social Inclusion & Accessibility, relevant impact and duty assessments and deliverability. Consideration is also given to the synergies between different option groupings.
Prime agricultural land	Agricultural land of Land Capability for Agriculture (LCA) classes 1, 2 and 3.1.
Public Transport Interchange	Places which allow for the interchange between one or more different (public/sustainable) mode of transport.
Ramsar site	Ramsar sites are wetlands of international importance, listed under the Convention on Wetlands of International Importance (Ramsar Convention 1971). It is Scottish Government policy to afford them the same protection as European Sites.
Receptor	In this context, an element that is susceptible to being affected (either directly or indirectly) by the project. Examples include habitats, species, people, properties, landscape, archaeological remains etc.
Scoping Report	Scoping Reports provide sufficient information about the potential environmental effects to allow the Consultation Authorities to provide an informed view regarding the environmental topics to be included in the SEA. Scoping Reports also provide a proposed methodology to be used for assessing potential environmental effects.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Scottish Transport Appraisal Guidance (STAG)	Transport Scotland's formal option appraisal toolkit and methodology to guide the development and assessment of transport options in Scotland. STAG provides an evidence-based and objective-led framework for: identifying transport problems and/or opportunities in a study area; setting objectives to address the transport problems/opportunities and identifying and appraising options in a consistent manner with the potential to meet the objectives. STAG is integral to the investment decision making process at the Strategic Business Case stage. The four stages of STAG are: Initial Appraisal Case for Change (formerly Pre-Appraisal), Preliminary Options Appraisal (formerly Part 1), Detailed Options Appraisal (formerly Part 2) and Post-Appraisal (Monitoring and Evaluation).
Secondary effects	Secondary or indirect effects are effects that are not a direct result of the plan but occur away from the original effect or as a result of a complex pathway.
Severance	The separation of communities from facilities and services used within their community. Alternatively, in relation to agricultural land, the division of land into separate areas, potentially affecting access or availability for agricultural use.
Sites of Special Scientific Interest (SSSI)	Designated areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species in the UK. The site network is protected under the provisions of Sections 28 and 19 of the Wildlife and Countryside Act 1981 as well as the Amendment Act 1985 and the Environmental Protection Act 1990.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEC) to protect important bird habitats.
Stakeholder	A person or group that has an investment, share or interest in something.
Strategic Environmental Assessment (SEA)	The process by which information about the environmental effects of proposed plans, policies and programmes are evaluated.

GLOSSARY	
TERMINOLOGY	DESCRIPTION
Strategic Transport Projects Review (STPR2)	A review of the Scottish transport network being undertaken by Transport Scotland. It aims to identify a range of potential interventions of national significance, which will be taken forward to improve the strategic transport network. Through selecting which transport projects of national significance should be progressed, the STPR would also affect regional and local transport networks.
Statutory Assessments	A number of statutory assessments are being undertaken for STPR2. These comprise an Equalities Impact Assessment, Fairer Scotland Duty Assessment, Child Rights and Wellbeing Impact Assessment, and Island Communities Impact Assessment. A Strategic Environmental Assessment is also being undertaken to assess and mitigate the transport impacts of options identified through STPR2. The methods for these assessments have informed the Appraisal Framework for STPR2 and visa-versa.
Sustainable Drainage Systems (SuDS)	SuDS, or sustainable drainage systems are a sequence of water management practices and facilities designed to drain surface water in a manner that will provide a more sustainable approach than what has been the conventional practice of routing run-off through a pipe to a watercourse.
Synergistic effects	Synergistic effects interact to produce a total effect greater than the sum of the individual effects.
Transport Planning Objectives (TPOs)	These seek to capture the essence of the evidence-based problem to be addressed or opportunity being sought. STPR2 has five national TPOs which are common to all regions and which reflect the evidence set out within the Case for Change reports. Where appropriate each region has considered the specific regional aspects in supporting the development of SMART (Specific, Measurable, Attainable, Relevant and Timed) sub-objectives.

1. Introduction

1.1. Background

In 2019, Transport Scotland commenced the second Strategic Transport Projects Review (STPR2) to help inform transport investment in Scotland for the next 20 years. STPR2 will help to deliver the vision, priorities and outcomes for transport set out in the National Transport Strategy (NTS2), aligning with other national plans such as the Climate Change Plan and the fourth National Planning Framework (NPF4).

Further information on NTS2 and STPR2 is provided in **Chapters 2 (STPR2 Overview) and 3 (Policy Context)** of this report.

STPR2 involves conducting an evidence-based review of the performance of Scotland's strategic transport network across active travel, bus, ferry, rail and the trunk road network. The outcomes from STPR2 will:

- enhance accessibility across Scotland for residents, visitors and businesses;
- create better connectivity with sustainable, smart and cleaner transport options; and
- highlight the vital contribution that transport investment can play in enabling and sustaining Scotland's economic growth.

The review will help inform Scottish Ministers on a programme of potential transport investment opportunities for the period between 2022 and 2042.

1.2. Phased Approach to STPR2 Delivery

The COVID-19 pandemic has directly led to a restructuring of STPR2. Recognising this, the Phase 1 report published in February 2021 (Jacobs Aecom 2021a) focused on short to medium term measures that could support and extend the increase in travel by sustainable travel modes, and those that could be brought forward to support economic recovery. The final report incorporates and therefore supersedes the Phase 1 recommendations and covers the period from 2022 to 2042. Lasting responses to the COVID-19 pandemic such as increased working from home do, however, create an element of uncertainty with regards to future travel patterns, but also opportunities for increased use of sustainable travel. The review has recognised this uncertainty and has ensured that there is an element of flexibility and agility to allow specific recommendations to be reviewed or amended as travel patterns become clearer.

The Phase 1 STPR2 SEA Progress Report (Jacobs Aecom, 2021b) was published in February 2021. Feedback to the Phase 1 STPR2 SEA Progress Report was received from NatureScot and Historic Environment Scotland. The SEA responses to this feedback are provided in **Appendix E (Consultation Feedback)**.

1.3. SEA Requirements

SEA is a means of systematically assessing the likely impact of a public plan on the environment. Under the Environmental Assessment (Scotland) Act 2005 (hereby referred to as 'the Act'), those bodies preparing qualifying Scottish plans are required to undertake a SEA of plans that are likely to have significant environmental effects, if implemented. The Act transposes the requirements of the European Community SEA Directive (Directive 2001/42/EC, 2001).

SEA aims to offer greater protection to the environment by ensuring public bodies (in this case, Transport Scotland) and those organisations preparing plans of a ‘public character’ consider and address the likely significant environmental effects.

STPR2, as described in **Section 1.1**, is considered to fall under Section 5(3) of the Act and, as such, a SEA is required to explore the potential for significant environmental effects, either positive or negative. As the STPR2 falls under this section of the Act, a ‘screening’ report did not need to be prepared, as it was clear that a SEA would be required. Thus, the key remaining stages of the STPR2 SEA are:

- SEA Scoping (completed and consulted on between December 2019 and February 2020).
- Draft Environmental Report (this stage - see **Chapter 7: The Approach to the Assessment**). This assessment stage establishes the likely significant (positive and negative) environmental effects of implementing STPR2. Any potential reasonable alternatives are considered at this stage, along with viable mitigation measures to avoid, reduce or offset significant adverse effects. The assessment and a summary of key findings are included in this draft Environmental Report (**Chapter 8: Assessment Results**), which is being made available for consultation alongside the draft STPR2.
- Final Environmental Report (that responds to SEA consultation comments and any post-consultation updates to the STPR2).
- Post-adoption Statement. This statement will be produced after the STPR2 has been adopted. It will outline how the assessment and consultation responses have been taken into account within the finalised STPR2. It will also include the final environmental monitoring programme for STPR2 implementation. Post-adoption statements are intended to improve the transparency of the decision-making process within plans such as STPR2.

The SEA topics listed in the SEA Directive, to be ‘scoped’ in or out at the SEA scoping stage, are:

- Climatic factors;
- Air quality;
- Population and human health;
- Material assets
- Water environment;
- Biodiversity, fauna and flora;
- Soil;
- Cultural heritage; and
- Landscape and visual amenity.

The SEA topics and sub-topics that are scoped into the SEA are used for the assessment of STPR2 at this Draft Environmental Report stage. All of these topics have been scoped in and the baseline that has been collected and summarised in **Chapter 4 (Baseline Summary)** has been used to develop targeted SEA objectives to perform the assessment. These SEA objectives are provided in **Chapter 7 (The Approach to the Assessment)**.

The SEA has been developed to incorporate the feedback from statutory Consultation Authorities. The Scottish statutory Consultation Authorities are:

- Scottish Environment Protection Agency (SEPA);
- NatureScot; and
- Historic Environment Scotland (HES).

The role of the statutory Consultation Authorities within SEA is to bring their individual environmental expertise to the assessment process. This can help to ensure that the future consultation process undertaken by a Responsible Authority (in this case Transport Scotland) is more robust. This in turn means that the public can gain a better understanding of the likely effect of a plan on the environment and meaningfully contribute to the plan’s preparation process by offering an informed view (Scottish Government, 2013).

1.4. Integrated Assessments

STPR2 is accompanied by various assessments that are required and integrated into each stage of STPR2 STAG assessment. These comprise this SEA, an Equality Impact Assessment (EqIA) and various other related assessments described overleaf. These impact assessments interact with each other, complement each other and ensure the STPR2 is environmentally sustainable and socially equitable. They share baseline data wherever possible. Figure 1 shows the impact assessments required for STPR2 (i.e. an SEA, Habitats Regulation Appraisal (HRA) and various social and equalities assessments including an EqIA, Child Rights and Wellbeing Assessment, Island Communities Impact Assessment, and Fairer Scotland Duty Assessment), and the relationships between these assessments.

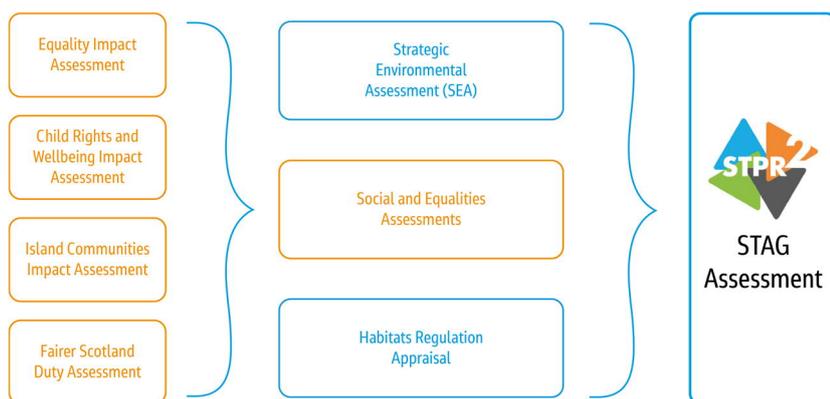


Figure 1: Relationship Between the EqIA and the SEA

1.4.1. Equality Impact Assessment

As a public body, Transport Scotland has a legal duty when creating new plans and policies to pay due regard to the Public Sector Equality Duty (PSED), included within the Equality Act 2010. The PSED aims to eliminate unlawful discrimination, promote equality and cohesion between different groups and advance equality of opportunity. The Equality Act 2010 (Authorities subject to the Socio-economic Inequality Duty) (Scotland) Regulations 2018 (more commonly known as the ‘Fairer Scotland Duty’), places a further legal responsibility on Transport Scotland to actively consider how it can reduce inequalities of outcome caused by socio-economic disadvantage when making strategic decisions.

Transport Scotland is also required to consider the impact of proposals on island communities (Islands (Scotland) Act (2018)) and take account of children’s rights and wellbeing (Children and Young People (Scotland) Act (2014)), which are therefore both considered within the wider impact assessment process.

For the purposes of assessment, the term EqIA encompasses all of these statutory requirements. The EqIA (Jacobs Aecom, 2022a) therefore includes the General Duty

Equalities Duty Assessment, the Children's Rights and Wellbeing Impact Assessment (CRWIA), Island Communities Impact Assessment (ICIA) and Fairer Scotland Duty Assessment (FSDA).

This SEA Environmental Report should be read in conjunction with the EqIA Reports listed above, particularly in relation to the cross-cutting themes of transport, economy and employment, health, housing, population and human health. The EqIA Report will be issued to the statutory consultees for completeness and transparency, despite this not being a statutory requirement.

1.4.2. Habitats Regulations Appraisal

The purpose of Habitats Regulations Appraisal (HRA) is to determine any likely significant effects on European Union-designated 'European sites'. These sites include Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC) and Special Protection Areas (SPAs) designated under the Birds Directive (2009/147/EEC). In addition, Candidate and Possible SACs, Potential SPAs and Ramsar wetlands should also be included in appraisals.

European sites are designated due to the presence of specific habitats and species of internationally important biodiversity value, otherwise known as 'qualifying interest features.'

Each stage in the development of the STPR2 is being reviewed to determine any potential indirect or direct impacts on European sites.

In Scotland, Regulation 48 of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) requires that competent authorities, in this case Transport Scotland, undertake an HRA of a plan that could potentially have a significant effect on a European Site.

The statutory consultation authority for HRAs in Scotland, NatureScot (formerly SNH), were consulted in September 2019 and have continued to be engaged in the HRA process for STPR2. For example, the methodology and programme for the STPR2 HRA was discussed in meetings with NatureScot in November 2020 and September 2021.

The HRA is being produced concurrently with the SEA but will be delivered as a separate report. The results of the HRA will be summarised in the final Environmental Report.

1.5. Purpose and Structure of Environmental Report

The purpose of the Draft Environmental Report is to present the assessed environmental effects of STPR2, including alternatives, in a form suitable for public consultation and use by decision-makers.

In line with the requirements of Schedule 3 of the Act, the Draft Environmental Report contains the following Chapters:

- **Chapter 1** summarises the general background to STPR2 and SEA and various impact assessments required for STPR2
- **Chapter 2** provides a more detailed background and context for STPR2, including the STPR2 stages
- **Chapter 3** shows the key relationships between STPR2 and other plans, programmes and strategies (PPS), including the environmental requirements associated with them
- **Chapter 4** provides a summary of the environmental baseline

- **Chapter 5** describes the approach to stakeholder engagement throughout the development of the STPR2 and the SEA
- **Chapter 6** describes the consultation requirements for SEA
- **Chapter 7** shows the approach for undertaking the SEA
- **Chapter 8** provides a summary of the assessment results
- **Chapter 9** describes examples of mitigation measures required to avoid or minimise any significant negative effects that would arise from implementing STPR2 and enhancement measures to create and maximise positive environmental effects
- **Chapter 10** provides an overview of the monitoring required for any significant environmental effects
- **Chapter 11** summarises the next steps required for consultation and each of the STPR2 impact assessments
 - Appendix A contains the constraints plans, depicting nationally or internationally significant environmental and heritage designations
 - Appendix B contains a comprehensive review of the PPS that are summarised in **Chapter 3** of the report
 - Appendix C contains the full, national-level environmental baseline data, which is summarised in **Chapter 4** of the report
 - Appendix D contains summaries of the regional environmental baseline data and regional assessment summary.
 - Appendix E contains summaries of the consultation responses
 - Appendix F contains the assessment of STPR2 multi-modal packages and the 45 STPR2 recommendations

2. STPR2 Overview

2.1. Purpose of STPR2

The purpose of STPR2 is to conduct a Scotland-wide, evidence-based review of the performance of the strategic transport system, against multiple criteria, including safety, environment, economy, integration, accessibility and social inclusion and, fundamentally, to support the Scottish Government's aims, including sustainable inclusive growth and the move to a low carbon transport system.

In so doing, STPR2 will make recommendations for potential transport investments for Scottish Ministers to consider as national investment priorities, in an updated 20-year potential transport investment plan for Scotland.

2.2. Content and Scope of STPR2

STPR2 will guide the Scottish Government's transport investment programme in Scotland for the next 20 years and help to deliver the vision, priorities and outcomes that are set out in NTS2.

It is recognised that Scotland's geography is unique and varied, ranging from rural lowlands to remote uplands, and from large cities to sparsely inhabited islands, meaning no two parts of Scotland are the same, nor are their travel patterns and demands. For that reason, STPR2 is being progressed at both a national and regional level in order to appraise options in the context of place.

The national focus considers the strategic links between the cities and key ports, international gateways and cross border links, whilst the regional focus considers the role of the strategic network in the context of regional economic geographies and changes emanating from, for example, the Planning Review, Enterprise and Skills Review, and City and Regional Growth Deals. This approach enables examination of regional issues which would have significant effects on the national strategic network, to deliver national investment priorities.

A total of 11 regions have been established for STPR2: Argyll & Bute, Ayrshire & Arran, Edinburgh & South East, Forth Valley, Glasgow City Region, Highlands & Islands, North East Scotland, Tay Cities, Scottish Borders, Shetland Islands, and South West Scotland. Within North East Scotland, Scottish Borders and South West Scotland work was carried out in advance of the STPR2 commission, and collectively these are referred to as the STPR2 Advanced Studies. Further details of the regional structure are set out in the National Case for Change Report (Transport Scotland, 2021a) and the 11 STPR2 regions are shown in Figure 2 below.

In the context of STPR2, a strategic transport project is defined as any transport project that materially contributes to Scottish Government/Transport Scotland policies and strategies. Specifically, this will include:

- Any transport project that plays a significant part in supporting the four NTS2 priorities and related outcomes;
- Projects or groups of projects related to transport networks owned, operated and funded directly by Transport Scotland;
- Passenger and freight access to ports and airports of national significance; and
- The inter-urban bus and active travel networks and principal corridors within urban areas.

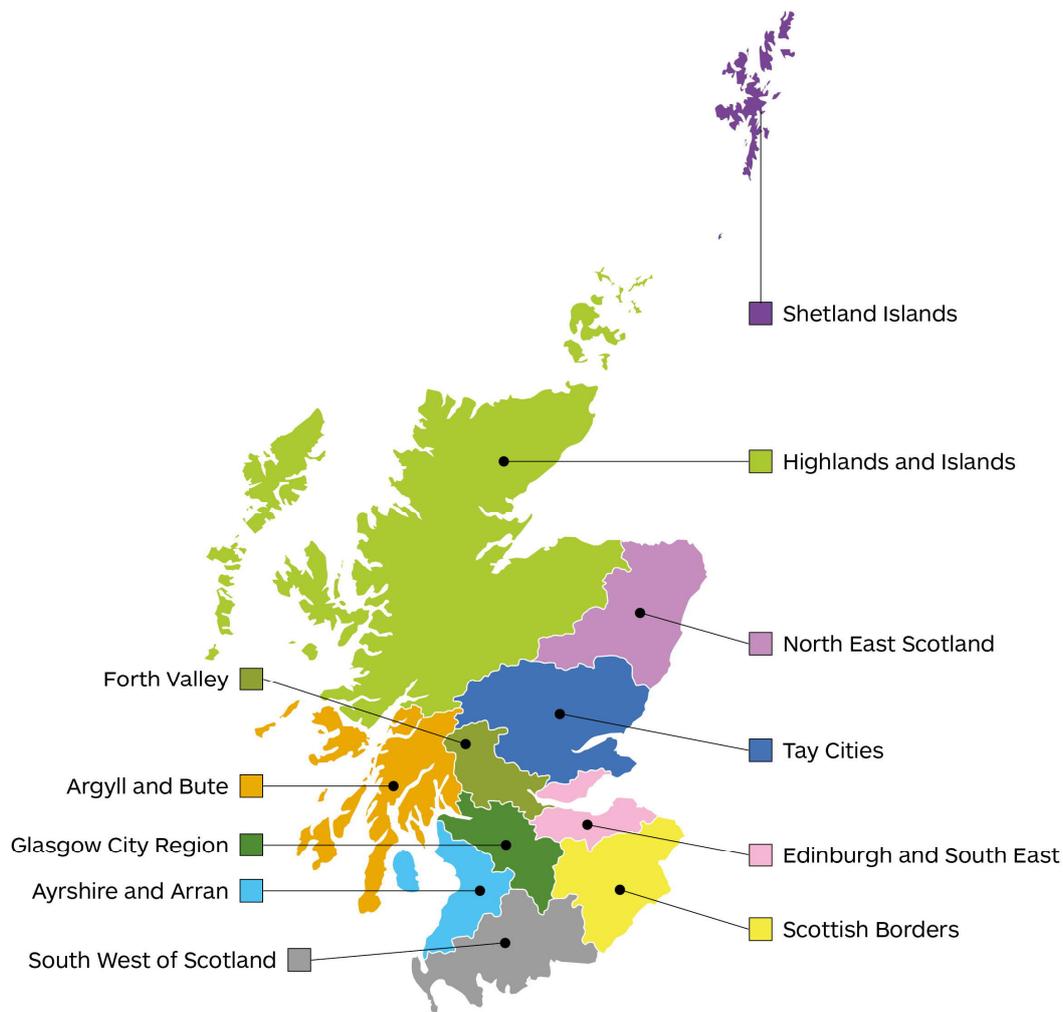


Figure 2: STPR2 Regions

2.3. STPR2 Development Approach

The STPR2 process has been developed using STAG. STAG is Transport Scotland's formal option appraisal toolkit and methodology to guide the development and assessment of transport options in Scotland. It provides an evidence-based and objective-led framework for: identifying transport problems and/or opportunities in a study area; setting objectives to address the transport problems/opportunities; and identifying and appraising options in a consistent manner with the potential to meet the objectives.

The four sequential stages in the STAG process are:

- Initial Appraisal: Case for Change;
- Preliminary Appraisal;
- Detailed Appraisal: Part 2 Appraisal; and
- Post Appraisal: Monitoring & Evaluation)

Whilst consistent with the version of STAG at the commencement of STPR2 (Transport Scotland, 2018), the STPR2 approach, where appropriate, has sought to supplement the STAG process by:

- reflecting Transport Scotland's current policy position by embedding the new NTS2 vision, priorities and outcomes;
- taking on board new and emerging areas of appraisal research, including research into inclusive growth and valuing the health benefits of schemes which increase active travel; and
- ensuring the outcomes from the wider suite of impact assessments being undertaken are fully integrated into the STPR2 appraisal process.

The Detailed Appraisal has taken cognisance of emerging updated Scottish Transport Appraisal Guidance (STAG) guidance, as set out within the Scottish Transport Appraisal Guidance - Draft Managers Guide for User Review published in September 2021. This includes the new criterion of 'Climate Change', against which all Packages have been appraised. The SEA approach to the climate change topic is discussed in **Section 7.9** of this report.

Sections 2.4 to 2.7 describe the key outputs for each of the STPR2 STAG Stages. The approach taken at each of these stages is described in detail in the Final STPR2 report (Jacobs Aecom 2022b). The SEA Post Adoption Statement will set out in detail how the SEA influenced each of these STPR2 stages.

2.4. Initial Appraisal: Case for Change

A National Case for Change Report was published in February 2021 (Transport Scotland, 2021a). It specifically covers key challenges for transport and infrastructure, and the impact of COVID-19 on current and future transport patterns.

A Case for Change Report was also produced for each of the Regions and these were also published in February 2021.

Five National Transport Planning Objectives were developed for use across the country during the appraisal process. Sitting under each TPO is a series of sub-objectives that have been made SMART (Specific, Measurable, Attainable, Relevant and Timed) to better define the overarching objectives TPOs and aid their application in appraisal (see **Section 2.5**).

Each region has developed a set of specific sub-objectives to reflect the issues within their specific area.

A long list of initial transport options was generated based on a range of sources, including: a review of options identified from recent local and regional studies; and extensive stakeholder engagement and public consultation activities. Approximately 14,000 individual ideas/suggestions/options were identified at this stage in the process.

This long list included options from the three advanced regions: Borders, North East and South West. Options from the three advanced regions: Borders, North East and South West, were reviewed through the STPR2 sifting methodology and reported through Update Notes that sit alongside the Case for Change reports. Options from the three advanced regions have been incorporated into the list of Groupings and appraised within STPR2.

Following an option cleaning and consolidation exercise, approximately 2,800 options were retained in the long list of interventions to be sifted.

Each of the 2,800 options has been reviewed using a methodology developed to drive consistency in the sifting of options across all of the STPR2 regions.

Following the sifting exercise, approximately 1,400 options remained in the process.

There were many options that shared common traits across the regions and many options which in isolation would not deliver the strategic improvements STPR2 is seeking to deliver. Recognising the strategic and national dimension, options that were sifted in for further appraisal were allocated to Groupings. Groupings were established to:

- Allow similar options to be collated together to provide a more manageable list for further appraisal;
- Collate similar options across regions, thus aiding consistency in definition and appraisal; and, where appropriate
- Allow options that may, on their own merit, not be considered strategic, however when grouped address the identified national and regional TPOs, Problems and Opportunities.

A total of 80 groupings were identified to take forward for preliminary appraisal.

The options/Groupings were reviewed from both a regional and modal/technical perspective to determine those that would meet the criteria for projects to be recommended in Phase 1 (i.e. short-term recommendations) and those to be considered in detail (i.e. medium- to long-term recommendations).

2.5. Preliminary Appraisal

The Preliminary Appraisal involved a qualitative appraisal of all Groupings against the following criteria: TPOs, STAG Criteria, Established Policy Directives and Deliverability Criteria.

The main purpose of the Preliminary Appraisal was to capture the likely impacts of options/Groupings, and key dependencies, with more detailed assessment undertaken at the Detailed Appraisal stage. Decisions on whether to reject Groupings at the Preliminary Appraisal stage or to take forward to Detailed Appraisal were made based on overall performance against the TPOs, STAG criteria, and deliverability criteria, with consideration of alignment with established policy directives, impact assessments and performance against future appraisal scenarios. Appendix G of the STPR2 Technical Report (Jacobs

Aecom 2022b) summarises whether or not a grouping was taken forward to the final recommendations, and the rationale behind that decision.

2.6. Detailed Appraisal

The Groupings, and the interventions included in the Groupings, that were identified to be taken forward from the Preliminary Appraisal were developed into multi-modal 'Packages' for the Detailed Appraisal. The following packages have been subject to Detailed Appraisal:

- Eleven Regional Packages; and
- One Package of National Interventions (representing all of the recommendations).

The approach to packaging has varied depending on whether the grouping was applicable only in a specific location(s) and circumstance(s) (e.g. railway stations, fixed links) or whether the grouping may be broadly applicable to certain types of location (e.g. active freeways, mobility hubs).

Groupings made up of location-specific options were assigned directly to regions based on the location of the component interventions, ensuring that region-specific problems and opportunities are addressed. Groupings whose component interventions were not location-specific were assigned to applicable area-based categories, which have then been mapped to regions, for consistency in the types of measures that have been considered in regions made up of similar area-based categories. Further details of the packaging process are provided in the STPR2: Draft Technical Report (Jacobs Aecom, 2022b).

Detailed Appraisal Summary Tables (ASTs) have been prepared to provide a clear and concise record of the performance of each Package under the Low and High Transport Behaviour Variants against the relevant TPOs and STAG criteria, policy alignment, and the Impacts and Duty assessments, with a summary of the appraisal metrics considered under each. Detailed Packaging ASTs are contained within Appendix H of the STPR2: Draft Technical Report (Jacobs Aecom, 2022b).

2.7. Post Appraisal: Monitoring and Evaluation

An STPR2 Monitoring Plan will be developed to outline how monitoring will be undertaken following implementation of STPR2 recommendations.

Similarly, a proposed Evaluation Plan will be required to outline the scope and timing of the evaluation to be undertaken, together with an Evaluation Summary Table (EST) which reports out-turn performance and impacts following implementation.

The SEA Post Adoption Statement (described in **Section 1.3**) will include an environmental monitoring framework that builds on existing monitoring regimes and the STPR2 Monitoring Plan and Evaluation Plan. Where necessary, the SEA monitoring framework will include additional requirements that supplement the STPR2 Monitoring and Evaluation Plans. This will ensure that all SEA topics are monitored sufficiently and any necessary remedial action is taken in the future if the monitoring results indicate this is necessary.

2.8. STPR2 Transport Planning Objectives

STAG is an objective-led appraisal process, and so a suite of Transport Planning Objectives (TPOs) were developed that take full account of evidence pertaining to the particular problems and opportunities identified by the case for change stage and within

the context of the relevant policies and strategies and evidenced by stakeholders and data. TPOs should:

- Provide a clear indication of what STPR2 is trying to accomplish;
- Introduce clarity where there may exist strong vested interests and entrenched views on priorities; and
- Allow the proper appraisal of candidate options to allow the decision makers to make informed choices on investment priorities.

At the national level, the NTS2 sets out the Case for Change for Scotland and is at the heart of the objective-setting process for STPR2. A consistent set of TPOs have been developed for use across the country during the appraisal process. These objectives are directly linked to each of the NTS2 priorities and outcomes. Sitting below the five TPOs are a set of national sub-objectives.

Within this approach there is a need to reflect the regional focus from the analysis and stakeholder engagement undertaken to inform the STPR2 process. Therefore, each region has developed a set of specific sub-objectives to reflect the issues within their specific area.

Sitting under each TPO is a series of SMART sub-objectives that have been made to better define the overarching objectives TPOs and aid their application in appraisal. The STPR2 TPOs and corresponding sub-objectives are as follows:

A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target

- Reduce the consumption of fossil fuels through a shift to more sustainable modes of transport.
- Increase the mode share of active travel for shorter everyday journeys.
- Increase the mode share of public transport by providing viable alternatives to single occupancy private car use.
- Reduce emissions generated by the strategic transport system.

An inclusive strategic transport system that improves the affordability and accessibility of public transport

- Increase public transport mode share by connecting sustainable modes of transport to facilitate integrated journeys.
- Improve mobility and inclusion, recognising the specific needs of disadvantaged and vulnerable users.
- Reduce transport poverty by increasing travel choice.
- Reduce the reliance on private car for access to key centres for healthcare, employment and education.

A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing

- Reduce demand for unsustainable travel by embedding the place principle in the changes to the strategic transport system.
- Increase the mode share of active travel for shorter everyday journeys.
- Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.

An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland

- Increase sustainable access to labour markets and key centres for employment, education and training.
- Increase competitiveness of key domestic and international markets, by reducing costs and improving journey time reliability for commercial transport.
- Increase resilience of accesses to key domestic and international markets to encourage people to live, study, visit and invest in Scotland.
- Increase the mode share of freight by sustainable modes.

A reliable and resilient strategic transport system that is safe and secure for users

- Improve resilience from disruption through adaption of Scotland's trunk road, rail and strategic ferry infrastructure.
- Reduce transport related casualties in line with reduction targets.
- Improve resilience through climate change adaptation within the management and maintenance of trunk road, rail and ferry infrastructure.
- Improve perceived and actual security of the strategic transport system.

2.9. STPR2 Themes

As discussed in **Section 1.2**, STPR2 has adopted a two-Phased approach. In order to assess and finalise options for assessment as potential Phase 1 measures, a proportionate approach was developed, considering options that could potentially meet the short-term requirements, whilst being guided by the overall STPR2 options list. The assessment approach was based on STAG, adopting a multi-criteria assessment based on each option's:

- Contribution to STPR2 Objectives (including Environmental and Equality objectives);
- Performance against the COVID-19 priorities for short-term measures; and
- Performance of Deliverability criteria (feasibility, affordability and public acceptability).

Following this approach, the Phase 1 process resulted in 20 interventions being recommended, against eight themes. A summary of the eight themes and associated interventions recommended from the Phase 1 process can be found within the STPR2 Update and Phase 1 Recommendations Report (Jacobs Aecom, 2021a).

2.10. STPR2 Draft Recommendations

The role of STPR2 is to provide the evidence base to recommend the transport investment priorities for Scottish Ministers for the next 20 years, in the face of great uncertainty and challenges. As we emerge from the short-term impacts associated with the COVID-19 pandemic, it is vitally important to consider transport investments around the overall vision set out in the NTS2 to ensure that we continue, at pace, towards the delivery of a sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.

Given the above, a number of overarching recommendations have been developed, which in combination constitute the fundamental components of the proposed transport investment plan, alongside an evidence base and robust rationale which 'makes the case' for the interventions. It is a key part of the first NTS2 Delivery Plan, as Government demonstrates the steps it is taking to achieve its outcomes. It also creates a foundation for business case development of the interventions, with STPR2 forming the strategic case for

the investments.

A total of 45 recommendations are presented below. These consist of some interventions that are specific to a particular location, others apply to certain regions in the country, and finally some of the recommendations are applicable across the whole country.

In many cases the interventions build on the individual investment and policy decisions taken in recent years, but the overall balance of the recommendations will help deliver NTS2 and meet the commitments contained within the associated Delivery Plan.

The following Sections provide further details on the recommendations. For presentational purposes the recommendations have been grouped into six themes, as follows:

- Improving Active Travel Infrastructure;
- Influencing Travel Choices;
- Enhancing Access to affordable public transport;
- Decarbonising Transport;
- Increasing Safety and Resilience on Strategic Transport Network; and
- Enhancing Strategic Connections.

Improving Active Travel Infrastructure

1. Connected neighbourhoods
2. Active freeways and cycle parking hubs
3. Village-town active travel connections
4. Connecting towns by active travel
5. Long-distance active travel network

Influencing Travel Choices

6. Behavioural change Initiatives
7. Changing road user behaviour
8. Increasing active travel to school
9. Improving access to bikes
10. Expansion of 20mph limits and zones

Enhancing Access to Affordable Public Transport

11. Clyde Metro
12. Edinburgh and South East Scotland Mass Transit
13. Aberdeen Rapid Transit
14. Provision of strategic bus priority measures
15. Highland mainline rail corridor enhancements
16. Perth-Dundee-Aberdeen rail corridor enhancements
17. Edinburgh-Glasgow-Perth rail corridor enhancements
18. Supporting integrated journeys at ferry terminals
19. Infrastructure to provide access for all at rail stations
20. Investment in Demand Responsive Transport and Mobility as a Service
21. Improved public transport interchange facilities
22. Framework for delivery of mobility hubs
23. National integrated public transport ticketing

Decarbonising transport

- 24. Ferry vessel renewal and replacement and progressive decarbonisation
- 25. Rail decarbonisation
- 26. Decarbonisation of the bus network
- 27. Behavioural change and modal shift
- 28. Zero emissions vehicles and infrastructure transition

Increasing Safety and Reliability on the Strategic Transport Network

- 29. Access to Argyll and Bute (A83)
- 30. Trunk road safety improvements to progress towards 'Vision Zero'
- 31. Trunk road and motorway network climate change adaptation and resilience
- 32. Trunk road and motorway network renewal for reliability, resilience and safety
- 33. Control centre of the future
- 34. Incident management system upgrade
- 35. Intelligent Transport Systems
- 36. Strategy for improving rest and welfare facilities for hauliers
- 37. Improving active travel on trunk roads through communities
- 38. Speed management plan

Enhancing strategic connections

- 39. Sustainable access to Grangemouth Investment Zone
- 40. Access to Stranraer and the ports at Cairnryan
- 41. Potential Sound of Harris/ Sound of Barra fixed link and fixed link between Mull and Scottish mainland
- 42. Investment in port infrastructure to support vessel renewal and replacement and progressive decarbonisation
- 43. Major station masterplans
- 44. Rail freight terminals and facilities
- 45. High speed rail and cross border rail enhancements

3. Policy Context

3.1. Overview

A number of government policies, strategies and commitments set the overall context for STPR2. It is therefore important to highlight the key issues of direct relevance to this review and outline how these have influenced and shaped STPR2. This includes, but is not limited to, NTS2 and its associated Delivery Plan; Climate Change Plan Update; the second Cleaner Air For Scotland strategy; NPF4; and The Bute House Agreement. This Chapter provides an overview of these policies. Consideration is also given to existing funding commitments.

3.2. NTS2 and Delivery Plan

3.2.1. NTS2 Overview

NTS2 provides the national transport policy framework, setting out a clear vision of a sustainable, inclusive, safe and accessible transport system which helps deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors. It sets out key priorities to support that vision:

- Reduces inequalities
- Takes climate action
- Helps deliver inclusive economic growth
- Improves our health and wellbeing

NTS2 is set within the context of a Climate Emergency, with the Scottish Government committed to transitioning our transport system to one that is net zero in carbon emissions by 2045. Set against a backdrop of increasing amounts of travel in Scotland over recent years, particularly vehicular travel, NTS2 clearly articulates the need for change in transport provision in Scotland. STPR2 has a key part to play in supporting the delivery of the priorities and outcomes by outlining a range of targeted measures to achieve fundamental change in overall travel demand, a shift to more sustainable modes such as walking, cycling and public transport, and in transitioning to a net zero economy.

The development of NTS2 has involved a comprehensive review of the key transport challenges facing Scotland and has included extensive engagement with a network of partners and authorities across the country comprising individuals, businesses and third sector organisations, to gather the views of a wide range of users of the transport system. Through this process, it has been identified that Scotland's transport system continues to face a number of challenges: many people encounter problems when trying to access the services they need; vehicles continue to emit greenhouse gases and pollute the places residents live and work; businesses still face congestion and delays when reaching their customers; and people still face barriers when wanting to cycle or walk to their destination.

3.2.2. Embedding NTS2

Important context is provided by the Sustainable Travel Hierarchy and Sustainable Investment Hierarchy set out in the NTS2 (see Figure 3) to manage the demand for transport and support the creation of successful places in the future.

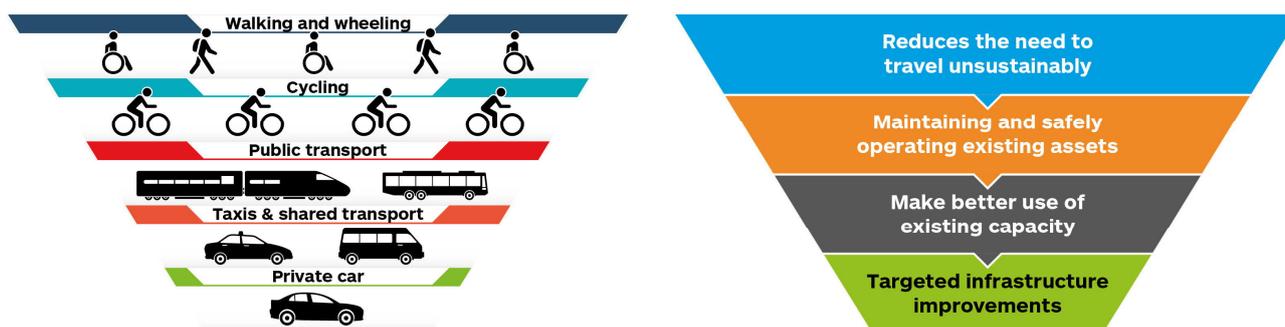


Figure 3: Sustainable Travel Hierarchy and Sustainable Investment Hierarchy

NTS2 states that the Sustainable Transport Hierarchy should be embedded in decision making; promoting walking, wheeling, cycling, public transport and shared transport options in preference to single occupancy private car use. At a national level the Sustainable Investment Hierarchy should be used to inform budgetary decisions, considering: investment aimed at reducing the need to travel unsustainably; investment aimed at maintaining and safely operating existing assets taking due consideration of the need to adapt to the impacts of climate change; investment promoting a range of measures, including innovative solutions, to make better use of existing capacity, ensuring that existing transport networks and systems are fully optimised (these may include technology-based, regulatory, fiscal or value engineering solutions to asset renewals); and investment involving targeted infrastructure improvements. In other words, there is an expectation that STPR2 should not bring forward recommendations for infrastructure improvements without first considering the requirement for, and effectiveness of, interventions in the first three categories.

At the Option Generation and Sifting stage of STPR2 (discussed further in **Chapter 7: The Approach to the Assessment**), the Sustainable Travel Hierarchy has been applied to promote interventions that prioritise walking, wheeling, cycling and public transport-based modes ahead of private car trips, and to ensure that interventions that reduce the need to travel unsustainably are prioritised over targeted infrastructure measures. In addition, each option considered within STPR2 has been assessed in terms of its position within the Sustainable Investment Hierarchy, in order to ensure that budgetary decisions are informed with sustainability in mind, in line with the approach promoted in the NTS2. Consideration has been given to whether each option being assessed is either;

- the only option available to address the identified problems and/or opportunities; or is
- the option that best aligns with the Sustainable Investment Hierarchy.

3.2.3. NTS2 Delivery Plan

The first NTS2 Delivery Plan (Transport Scotland, 2020a) covers the period to March 2022, after which there will be annual delivery plans. It updates on three initial areas: (i) increasing accountability, where, amongst other initiatives, the NTS2 Delivery Board has been established - chaired by the Cabinet Secretary for Transport, Infrastructure and Connectivity and bringing together senior transport sector representatives; (ii) strengthening evidence, which focuses on the process and mechanisms being utilised to deliver STPR2 alongside work on monitoring and evaluation frameworks; and (iii) managing demand, which focuses on place-based initiatives and working with local authority partners.

When the NTS2 was published in February 2020 it recognised the need for its implementation to be flexible to adapt to emerging and changing evidence. This is

particularly relevant in light of the COVID-19 pandemic and Government response, and the impact of this on Scotland's economy and society. As a result, the NTS2 vision and outcomes remain valid in terms of a long-term strategy setting the framework for decision making on transport in Scotland. However, given the impacts from the pandemic, it is pertinent to take account of the emerging evidence of the impact of COVID-19 on travel demand and behaviour, and its impact in terms of exacerbating existing inequalities, including around access to and affordability of transport, particularly for those already experiencing disadvantage. This first Delivery Plan does this and sets out a series of commitments and actions under each of the four priorities. Whilst many of these commitments are relevant to the development of STPR2, those referencing STPR2 specifically are:

- "STPR2 will provide an evidence base for future investment decisions on physical barriers to public transport accessibility at transport interchanges, stations and terminals";
- "An Islands Connectivity Plan (ICP) will be published, as the successor to the Ferries Plan 2013-22. It will develop objectives based on supporting delivery of NTS2 and the National Islands Plan (Scottish Government, 2019a), and develop proposals to meet those objectives which justify the continued high level of Government intervention. The ICP will be closely linked to the outcomes of the STPR2, in order to consider island connectivity more broadly having regard to aviation, ferries and fixed links, and to connection and onward travel";
- In the context of bus priority through the Bus Partnership Fund and managed motorways: "Through STPR2 we will continue to investigate where else on the trunk and motorway network would be appropriate"; and
- "We will aim to ensure alignment between the STPR2 and NPF4, including assisting in the transport appraisal of the NPF4 national spatial strategy and potential national developments as appropriate."

Relevance for STPR2

NTS2 sets the vision for the country's transport system over the next 20 years. At the heart of the strategy is the recognition that we need to deliver a step-change in behaviour and provision of attractive, affordable and accessible sustainable travel options. This is echoed in the NTS Delivery Plan covering the period to March 2022.

3.3. Climate Change Considerations

3.3.1. Climate Change and Transport in Scotland

Transport's contribution to the climate emergency and net zero targets, means that there is a need to reduce travel and deliver modal shift towards walking, cycling and public transport. If we continue as we are now, forecasts suggest a 40% increase in vehicular travel by 2037. The recent work by the Committee on Climate Change (2019) set out an assumption of a 10% modal shift by 2030 within its net zero scenario and the commitment to reduce car kilometres by 20% by 2030 was presented in the Climate Change Plan Update in December 2020. This commitment was included in Scotland's COP26 climate change commitments (Under 2° Secretariat Climate Group, 2021) and in the route map currently being consulted on by Transport Scotland (2022).

To achieve a modal shift of the scale required to address the climate emergency, will require significant changes to the complex travel behaviours of users, operators and the

public and private sectors. In accordance with the Sustainable Travel Hierarchy, STPR2 should prioritise interventions that increase the modal share of shorter everyday trips by walking, wheeling and cycling; short- to medium-length trips by public transport and longer trips by rail or coach and low emission vehicles.

Transport is a derived demand and therefore key decisions and investments are required across several other sectors to meet net zero targets and in so doing put 'place' at the heart of the decision making process. Land use planning and digital connectivity are two areas not within the scope of STPR2 that will both have a significant part to play in meeting our net zero targets. This will help develop more sustainable and inclusive communities that encourage walking, wheeling and cycling as well as public transport as the preferred choice of travel. This will increase physical activity and realise health and wellbeing benefits.

Fundamental to the delivery of an inclusive net zero economy, and thus improving health and wellbeing, is the requirement to support and accelerate the transition to low emission vehicles. A collaborative public and private sector relationship will be crucial in achieving this transition.

The policy backdrop, upon which STPR2 has been developed, sets out an overarching and urgent imperative to address climate change and to achieve net zero carbon by 2045. STPR2 has sought to embed these factors into the appraisal process from the very beginning, ensuring that interventions emerging from STPR2 help to deliver the NTS2 outcomes and support wider net zero commitments.

Earlier stages of the STPR2 process, undertaken prior to the publication of the new STAG guidance, as described in **Section 2.4**, have adopted a number of approaches to strengthen the STAG-based appraisal, with a particular focus on ensuring the identification of sustainable transport interventions that support the priorities of NTS2, including the priority "Takes Climate Action". For example, at the Option Generation and Sifting stage (discussed further in **Chapter 7: The Approach to the Assessment**), the Sustainable Travel Hierarchy and Sustainable Investment Hierarchy have been applied to promote interventions that prioritise walking, wheeling, cycling and public transport-based modes ahead of private car trips, and to ensure that interventions that reduce the need to travel unsustainably are prioritised over targeted infrastructure measures. Groupings (of interventions) assessed through the STPR2 work have been appraised against a set of TPOs (see **Section 2.8**) which have been directly informed by the NTS2 priorities, including "Takes Climate Action". This includes assessing interventions against the following TPO: A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target.

Groupings taken through the appraisal process have been assessed using a Scenario approach, as noted within **Section 7.4**, with consideration given to a range of possible futures and how interventions behave in them. One scenario describes a future in which the 20% reduction in car kilometres by 2030 and net zero by 2045 are achieved. Performance of the Groupings under these scenarios has informed the Preliminary Appraisal and the Detailed Appraisal.

The development of STPR2 has also been informed by the requirements set out in Scotland's Climate Change Plan Update and Cleaner Air for Scotland, as set out in the sections below.

3.3.2. Climate Change Plan Update

The Scottish Government published “Securing a Green Recovery on a Path to Net Zero: Climate Change Plan 2018–2032 – update” in December 2020 (Scottish Government, 2020c) which reflects the ambition of the new targets set in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. These comprise the reduction of Scotland’s greenhouse gas emissions to net zero by 2045 at the latest, with interim targets of at least:

- 56% by 2020;
- 75% by 2030; and
- 90% by 2040.

The transport chapter of the Plan sets out context around the current situation and how the shift to home working may become a longer-term trend. Coupled with the focus on 20-minute neighbourhoods, the Plan notes the opportunity to capitalise on these to reduce the need to travel, and, when travel occurs, for it to be focused on more sustainable modes.

The Plan includes the following statement in relation to transport: “By 2032 our roads will contain no new petrol and diesel cars and vans; we will have decarbonised our passenger railways; and we will have begun work to decarbonise challenging transport modes such as HGVs, ferries and aviation. Car kilometres will have reduced by 20%, and sustainable transport will be the instinctive first choice for people.”

This statement is accompanied by a timeline to 2032 that sets out the key milestones in the intervening years:

- 2024 – majority of new buses are zero emissions.
- 2025 – need for any new petrol and diesel light commercial vehicles in public bodies phased out. Delivery of first Active Freeways: segregated active travel routes on main travel corridors.
- 2030 – conditions created to phase out the need for all new petrol and diesel vehicles in Scotland’s public sector fleet. Need for new petrol and diesel cars and vans phased out. Car kilometres reduced by 20%.
- 2032 – Scotland’s passenger rail services considerably decarbonised, with just a few years to go until they are fully decarbonised.

During 2021 the Scottish Government and the Convention of Scottish Local Authorities (COSLA) developed a route map to deliver the shift in travel behaviours required to meet the 20% reduction target, recognising the need for ongoing collaboration and partnership working between national, regional and local government as well as public, private and third sector partners (Scottish Government, 2021h). The route map sets out the suite of policies from across Government that may be implemented to support car-use reduction in order to both address climate change and deliver a healthier, fairer and more prosperous Scotland, and recognises the role of STPR2 in setting out recommendations for future investment decisions.

Successful implementation of the actions set out in the route map are expected to lead to a transformational way of living in Scotland, where a new localism thrives in villages, towns and city neighbourhoods; where streets become places that are safe for people of all ages to travel by walking and cycling whilst maintaining private vehicle access for those with disabilities; where longer journeys are made by convenient and affordable public or shared transport; and with greater use of on-line access to key services and opportunities. This future will both enable statutory climate change targets to be met, whilst at the same time

creating better ways of living, improved health and wellbeing and the associated social and economic benefits of a society less dominated by private cars.

Relevance for STPR2

Transport remains Scotland's biggest emitting sector (35.5% of emissions) with cars accounting for around 40% of transport emissions, and therefore significant action is required. It is also acknowledged that technological advances to green vehicles will not be enough and managing demand and behavioural change will be needed. Therefore, STPR2 will be required to develop a programme of interventions to establish conditions that work towards a reduction in car kilometres of 20% by 2032.

3.3.3. *Cleaner Air For Scotland 2: Towards A Better Place For Everyone*

In July 2021, the Scottish Government published Cleaner Air For Scotland 2 (Scottish Government, 2021a) and an associated Delivery Plan. It sets out how the Scottish Government will deliver further air quality improvements over the next five years. This is considered necessary to secure the vision of Scotland having the best air quality in Europe.

The Delivery Plan is structured around ten Priorities, including Transport, which reflect the ten high-level themes from the review of Cleaner Air for Scotland completed in 2019. Specifically relating to Transport, the Plan notes "We support a modal shift to active travel and public transport. This will mean, amongst other objectives, providing a transport system that facilitates active travel choices, better public transport provision and constraints upon private vehicle use, especially in urban centres where pollution and congestion are most acute."

The Plan makes reference to the Sustainable Investment Hierarchy and the role of STPR2 in contributing to a reduction in the need to travel unsustainably, making the most of existing transport strategic systems and supporting strategic investments in sustainable, smart and cleaner transport options, in accordance with Just Transition principles (Scottish Government, 2021b).

STPR2 will align with the Transport Priority of the Delivery Plan and will indirectly align with several other Priorities, including Integrated Policy, Placemaking and Behaviour Change.

Relevance for STPR2

The Scottish Government has set ambitious targets for air quality improvements to secure the vision of Scotland having the best air quality in Scotland. Amongst other objectives, it supports a transport system that facilitates active travel choices, better public transport provision and constraints upon private vehicle use, especially in urban centres where pollution and congestion are most acute. STPR2 will have an important role to play in contributing to a reduction in the need to travel unsustainably, making the most of existing transport strategic systems and supporting strategic investments in sustainable, smart and cleaner transport options.

3.4. National Planning Framework 4

The Scottish Government's Programme for Government highlights the significance of the National Planning Framework to put planning at the heart of delivering green, inclusive and

long-term sustainable development in Scotland (Scottish Government, 2021c). On 10 November 2021, the consultative draft of NPF4 was laid to the Scottish Parliament (Scottish Government, 2021d). Once approved and adopted by the Scottish Ministers (expected during 2022), NPF4 will become part of the statutory development plan and will directly influence planning decisions. NPF4 sets out a need to “embrace and deliver radical change to tackle and adapt to climate change, restore biodiversity loss, improve health and wellbeing, build a wellbeing economy and create great places.” In this context NPF4 recognises the need to plan our places in a way that reduces the need to travel.

To support the spatial strategy a number of policy changes are set out within NPF4, such as embedding the NTS2 sustainable travel and investment hierarchies into the appraisal and assessment of development proposals. The new spatial strategy also sets out an approach whereby future places, homes and neighbourhoods will be better, healthier and more vibrant places to live, by reducing the overall volume of travel by building quality places that work for everyone through the concept of 20-minute neighbourhoods.

To meet many of the future needs of society it is crucial that services and facilities are easily and affordably accessed. Therefore, the NPF4 advocates the infrastructure-first approach in planning for future development to provide communities with the opportunity to travel in a sustainable manner from the outset.

Relevance for STPR2

As the NPF4 (draft) has been developed alongside the Infrastructure Investment Plan and STPR2, it embeds the importance of “place” across land-use planning and transport. NPF4 also sets the context for developing an investment programme that is aligned with the Sustainable Travel Hierarchy presented in the NTS2.

3.5. Bute House Agreement

In August 2021, the Scottish Government and the Scottish Green Party Parliamentary Group agreed to work together over the next five years to build a green economic recovery from COVID-19, respond to the climate emergency and create a fairer country. A shared policy programme, known as The Bute House Agreement, details collaboration on the climate emergency, economic recovery, child poverty, the natural environment, energy and the constitution. It is recognised that bold action is needed to increase the pace of change and the scale of investment to support the priorities and outcomes set out in NTS2, including ambitious climate goals.

In terms of transport, it is agreed that in the face of the climate emergency there is a need to shift away from spending money on new road projects that encourage more people to drive, and instead focus money and effort on maintaining roads, improving safety and providing a realistic and affordable alternative through investing in public transport and active travel.

The agreement sets out a number of commitments which will complement STPR2, including to:

- align transport policy with climate targets and the goal of reducing car/km by 20% by 2030.
- increase the proportion of Transport Scotland’s budget spent on Active Travel initiatives so that by 2024-25 at least £320m or 10% of the total transport budget will be allocated to active travel.

- during this parliamentary session, invest over £5 billion in maintaining, improving and decarbonising Scotland's rail network.
- commission a Fair Fares Review to ensure a sustainable and integrated approach to public transport fares. This will look at the range of discounts and concessionary schemes which are available on all modes including bus, rail and ferry. The review will consider options against a background where the costs of car travel are declining and public transport costs are increasing, exacerbating the impact on those living in poverty.
- progress the on-going review of transport governance in Scotland to ensure it is fully aligned with the climate and traffic reduction targets, and to ensure that the national and local capacity is in place to deliver active travel goals.

It is also agreed that new roads projects will normally only be taken forward where they reduce the maintenance backlog; address road safety concerns or adapt the network to deal with the impacts of climate change or benefit communities such as bypassing settlements. Furthermore, it is agreed that road infrastructure will not be built to cater for forecast unconstrained increases in traffic volumes.

The shared policy programme acknowledges the role of STPR2 to direct future transport infrastructure investment.

Relevance for STPR2

The shared draft policy programme acknowledges the role of STPR2 to direct future transport infrastructure investment. It is agreed that in the face of the climate emergency there is a need to shift away from new road projects that encourage more people to drive, and instead focus money and effort on maintaining roads, improving safety and providing a realistic and affordable alternative through investing in public transport and active travel.

The agreement sets out a number of commitments which will complement STPR2, including to reduce car/km by 20% by 2030; increase the proportion of Transport Scotland's budget spent on Active Travel initiatives; invest in the maintenance, improvement and decarbonisation of Scotland's rail network; commission a Fair Fares Review; and progress the on-going review of transport governance in Scotland.

New roads projects will normally only be taken forward where they reduce the maintenance backlog; address road safety concerns or adapt the network to deal with the impacts of climate change or benefit communities such as bypassing settlements. Furthermore, it is agreed that road infrastructure will not be built to cater for forecast unconstrained increases in traffic volumes.

3.6. Existing Funding Commitments

3.6.1. Infrastructure Investment Plan for Scotland

The Scottish Government published the Infrastructure Investment Plan for Scotland 2021/22 to 2025/26 (IIP) on 04 February 2021 following consultation on the Draft Plan in September 2020 and building on the previous IIP published (Scottish Government, 2021e). The IIP was published within the COVID-19 timeframe and is strategically aligned to address the impacts of the pandemic and those from the UK's exit from the European Union. It also draws on inputs from the work of the Infrastructure Commission for Scotland.

The vision of the IIP is that “our infrastructure supports Scotland’s resilience and enables inclusive, net zero, and sustainable growth.” The IIP identifies the need for investment in infrastructure to provide an effective response to both COVID-19 but also to the key longer-term trends of climate change, technological developments and demographic change.

The IIP is based on an investment hierarchy, as recommended by the independent Infrastructure Commission for Scotland, which complements the hierarchy outlined in NTS2. The new common investment hierarchy prioritises enhancing existing assets ahead of new build, which on a sequential basis comprises: determine future need; then maximise use of existing assets; then repurpose and co-locate; and finally replace or new build.

The IIP identifies delivery under three themes. These themes directly link to Scotland’s National Performance Framework and the UN Sustainable Development Goals (Scottish Government, 2021f; United Nations, 2015).

- Theme 1 – Enabling the transition to net zero emissions and environmental sustainability;
- Theme 2 – Driving inclusive economic growth; and
- Theme 3 – Building resilient and sustainable places.

Relevance for STPR2

The IIP provides additional detail on expenditure in the next few years to support the commitments made within the Programme for Government and sets the context of future investment in transport to deliver an effective response to the COVID-19 pandemic. The themes have a good strategic fit with the STPR2 objectives. The IIP recognises the need to invest in the areas of the transport sector being considered through STPR2, including both an effective response to COVID-19 and the key longer-term trends of climate change, technological developments and demographic change.

3.6.2. Capital Spending Review

The Capital Spending Review Framework was published alongside the draft IIP and the Capital Spending Review was published on 04 February 2021 alongside the final IIP (Scottish Government, 2020b; Scottish Government, 2021g). Both are closely aligned, with the IIP setting out the strategy, and the Capital Spending Review ensuring that priorities are fully funded or financed. Both have been prepared to support delivery of projects and programmes with improved outcomes and benefits across three themes, as follows:

- Enabling the transition to net zero emissions and environmental sustainability
- Building resilient and sustainable places
- Driving inclusive economic growth

By aligning strategy, project and programme funding there is confidence that the announced plans are affordable and fully funded, whether through the Programme for Government 2021 or as set out in the IIP.

The IIP seeks to deliver the National Infrastructure Mission commitment to boost economic growth by increasing annual investment in infrastructure by 1% of 2017 Scottish Gross Domestic Product (GDP) by 2025-26. The economic rationale for the National Infrastructure Mission is founded on the important role that infrastructure investment plays in improving the productive capacity of the economy and delivering long-term

economic benefits.

As the IIP sets out, there is a need to adjust the balance of investment in favour of renewing and extending the life of existing infrastructure, both on environmental and value-for-money grounds. As such, the Capital Spending Review will target a material uplift in capital maintenance-type investment, relative to current levels of investment, working towards doubling such annual investment over the next five years.

The Capital Spending Review also addresses the significant near-term challenges presented by the COVID-19 pandemic, recognising the profound impact the virus has had on our whole way of life, and the role infrastructure has to play in helping businesses and communities to adapt and recover. Alongside the harmful consequences of COVID-19, a number of positive shifts have been observed as people's lives have become more home-based, for example towards active travel or to make more use of digital services. Harnessing these changes will be key.

Relevance for STPR2

The Review sends a strong signal on the future need to adjust the balance of investment in favour of renewing and extending the life of existing infrastructure, both on environmental and value-for-money grounds. This can be used as an evidence base for transport investment through the Government's capital spending review process.

3.6.3. Summary

The current policy, plan and investment landscape is complex and multi-layered. There is an overarching and urgent imperative to address climate change and to achieve net zero carbon by 2045. A number of approaches have been adopted to strengthen the STAG-based appraisal undertaken for STPR2, with a particular focus on ensuring the identification of sustainable transport interventions that support the draft NPF4, priorities of NTS2, including the priority 'Takes Climate Action', and to achieve the 20% reduction in car km supportive of the Climate Change Plan. Alongside this are the needs to improve our health and wellbeing. There is also a clear need to deliver inclusive economic growth and to reduce inequalities.

The STPR2 process has taken cognisance of the constraints to funding and presents an ambitious, but realistic, set of recommendations which will set the strategic direction of transport investment in the next 20 years.

3.7. Relationship with Other Plans, Programmes or Strategies (PPS)

The SEA needs to consider the most relevant PPS to STPR2. This helps to identify wider environmental protection objectives (not just the STPR2 SEA Objectives) and issues that STPR2 should take cognisance of, and might support with its delivery.

A wide range of national-level policies from various PPS need to be considered in the development of the STPR2 and the SEA. The key relevant aspects of these policies are included in **Appendix B (Plans, Programmes and Strategies)**. A summary of the key environmental requirements and objectives for each SEA topic identified through the review is presented in Table 1 below.

A review of the associated environmental protection objectives highlights existing and potential problems, as well as opportunities for enhancement and benefits, and has served as an important base upon which to build the SEA Assessment Framework.

Table 1: Key Environmental Requirements Emerging from the PPS Review

SEA TOPIC	KEY ENVIRONMENTAL REQUIREMENTS
<p>Biodiversity</p>	<p>Promote the maintenance, protection and restoration of biodiversity on land and in Scotland’s seas at all levels;</p> <p>Connect people with the natural world to enhance their health and wellbeing and to involve them in decisions about their environment;</p> <p>Encourage the management of features of the landscape which are of major importance for wild fauna and flora;</p> <p>Implement nature-based solutions (NPF4);</p> <p>Maximise the benefits of a diverse natural environment and the services it provides to deliver multiple benefits, including social and sustainable economic growth; and</p> <p>Create a natural environment resilient to the threats of climate change, invasive species, habitat fragmentation, pests and diseases.</p>
<p>Population and Human Health</p>	<p>Eliminate discrimination and promote equality on Scotland’s transport network;</p> <p>Provide safe and hygienic public transport services and facilities, to reduce the spread of infectious diseases;</p> <p>Improve the quality, accessibility and affordability of public transport;</p> <p>Improve health and wellbeing, including through the promotion of increasing levels of physical activity;</p> <p>Increase levels of access to bikes through projects that support inclusive cycling initiatives;</p> <p>Increase active travel participation for young people;</p> <p>Create a culture of walking and cycling, where everyone walks or cycles more often as part of their everyday travel - by creating better and more attractive environments which enable easy, convenient and safe active travel for everyone – including segregation from motorised traffic; and</p> <p>Modernise public transport services through multi-modal, smart ticketing and electronic payment systems to make travel easier, more accessible and sustainable.</p>

SEA TOPIC	KEY ENVIRONMENTAL REQUIREMENTS
Material Assets	<p>Promote sustainable design and innovation to reduce material consumption;</p> <p>Re-use vacant and derelict land (NPF4);</p> <p>Integrate land use and transport (NPF4);</p> <p>Minimise waste generation;</p> <p>Maintain and enhance transport infrastructure;</p> <p>Encourage an innovative approach to heat generation/renewable infrastructure;</p> <p>Maximise investment in rail infrastructure to support surge in demand, supporting a modal shift in order to reduce emissions;</p> <p>Improve safety on Scotland’s roads by prioritising initiatives aimed at preventing accidents and developing appropriate accident mitigation;</p> <p>Safeguard access to ports and harbours and encourage their sustainable growth to maximise their potential to facilitate cargo movement, passenger movement and to support other sectors;</p> <p>Safeguard essential maritime transport links to islands and remote in-land communities;</p> <p>Improve the provision and connectivity of ferry services in Scotland in order to improve reliability, maximise employment, business and lei-sure opportunities and to promote social inclusion; and</p> <p>Improve connectivity between ferry services and sustainable modes of transport – i.e. public transport and active travel.</p>
Soil	<p>Safeguard and maximise the multiple benefits and functions of soils as a vital part of Scotland’s economy, environment and heritage; and</p> <p>Protect and promote carbon-rich soils, such as healthy peatland, due to the benefits of carbon capture and storage.</p>
Water	<p>Improve the environmental status of water bodies and reduce adverse impacts on the water environment; and</p> <p>Promote sustainable water use by reducing discharge and emissions and the pollution of groundwater.</p>

SEA TOPIC	KEY ENVIRONMENTAL REQUIREMENTS
Air and Climatic Factors	<p>Promote Local Authorities to review and assess air quality in their areas;</p> <p>Enhance health, wellbeing, environment, place-making and sustainable economic growth through improving air quality across Scotland;</p> <p>Ensure citizens are well informed, engaged and empowered to improve air quality;</p> <p>Protect citizens from the harmful effects of air pollution;</p> <p>Encourage local authorities to develop and implement Air Quality Action Plans in Air Quality Management Areas</p> <p>Reduce greenhouse gas emissions;</p> <p>Meet key emissions-reduction target dates (i.e. 2020 and 2050), including annual targets; and</p> <p>Largely decarbonise road transport and encourage modal shift to lower emission modes of travel.</p>
Cultural Heritage	<p>Enhance the cultural, social, environmental and economic value of Scotland’s historic assets in order to achieve sustainable development in communities;</p> <p>Emphasise the positive impact of protecting these assets on building vibrant communities through good design;</p> <p>Detrimental impacts on the historic environment should be minimised; and</p> <p>Strengthen the collaboration between different organisations and groups in protecting the historic environment</p>
Landscape / Townscape	<p>Protect Scotland’s landscape due to its contribution to quality of life, promoting the country’s national identity and enhancing the economy;</p> <p>Ensure that the unique qualities of Scotland’s cities, their historic environment and the character of its urban areas are safeguarded for the future;</p> <p>Design places that are compact, walkable and connected by sustainable modes of transport; and</p> <p>Protect important landscape, townscape, seascape and natural environmental features</p>

4. Baseline Summary

4.1. Overview

Schedule 3 of the Environmental Assessment (Scotland) Act 2005 requires that the following be identified when undertaking a SEA:

- Relevant aspects of the current state of the environment and its likely evolution without the implementation of the plan or programme;
- Environmental characteristics of areas likely to be affected;
- Relevant existing environmental problems; and
- Relevant environmental protection objectives at the international, European or national level (as described in **Section 7.3**).

The full national-level environmental baseline, that describes these aspects, is provided as **Appendix C (National Baseline)**, which also contains discrete sections that summarise the likely evolution of the environmental baseline if the STPR2 was not implemented (i.e. the 'do nothing' or 'without plan' scenario). The regional environmental baseline is summarised in **Appendix D (Regional Environmental Summaries)**. Information has been drawn from a range of sources, including the Scottish Government, NatureScot, HES, SEPA, and Scotland's Environment Web, amongst others.

All of the SEA topics listed in the SEA Directive have been 'scoped in' to the STPR2 SEA, as described in **Section 7.2**.

4.2. Baseline Summaries by SEA Topic

A summary of the key national-level baseline findings for each SEA topic is provided below:

Climatic Factors

Climate change is a threat to all countries and the expected impacts will affect infrastructure and its operation. Ensuring current and future infrastructure is resilient against the following anticipated impacts is vital:

- Average temperatures increasing across all seasons;
- Our weather will remain variable and may become more variable;
- Typical summers will be warmer and drier;
- Intense heavy rainfall events will increase in frequency in both winter and summer
- Rising sea levels; and
- Fewer days / periods of frost and snowfall.

Air quality

- Air pollution originates from organic and human sources
- Urban air quality has improved significantly during the past 70 years as industry has moved outside of urban areas and regulations have incentivised technological innovation in residential heating and vehicles
- Scotland has declared 38 Air Quality Management Areas where air quality objectives are not being met. Almost all of these are located in urban areas due to emissions of nitrogen oxides and particulates primarily originating from road transport.

Population and Human Health

- There are also significant numbers of people living in remote communities on the mainland and on the islands surrounding Scotland
- The population is forecast to increase from 5.4 million (current) to 5.7 million by 2026
- Scotland's obesity rates continue to be amongst the highest in the developed world and are a significant public health issue. Women and children in the most deprived areas are affected by extreme obesity
- Transport is a significant contributor to poor air quality in urban areas. There are significant short and long-term air pollution impacts on human health.
- The Covid-19 pandemic has led to an increase in walking and cycling as people have sought to avoid public transport

Material Assets

- Scotland has significant valuable material assets, encompassing those within the natural and built environments
- The country has access to a range of crucial natural resources that underpin the operation of the country, such as water, soil, fossil fuels and minerals
- The built environment encompasses the country's infrastructure for transport, waste management, energy and land-use, capturing a wide range of policies

Water Environment

- Scotland has two river basin management plans to improve the condition of inland water bodies and coastal waters
- Effective protection of coastal areas and management of inland water basins is key to managing flood risk. There is a need to avoid development in areas which are or are likely to be highly vulnerable to flood risk.
- Scotland's water provides an essential resource for providing drinking water for the population and as a resource in agriculture and industry, as well as supporting a rich diversity of habitats and species

Biodiversity, Flora and Fauna

- Scotland has a vast number of designated and undesignated areas that contain important habitats and species
- Scotland's protected sites include 241 Special Areas of Conservation (SAC), 153 Special Protection Areas (SPA) and 51 Ramsar sites, 1,423 Sites of Special Scientific Interest (SSSI), 30 Nature Conservation Marine Protected Areas (MPAs)

Soil

- Soil is a non-renewable resource and one of Scotland's most important assets, underpinning much of the natural environment, providing the basis for food, regulating water quality and acting as a foundation for the built environment
- Scotland has significant areas of peatlands that act as carbon sinks, playing a key role in climate change mitigation. It is important to minimise disturbance of carbon-rich soils, as disturbances can lead to significant releases of carbon.

Cultural Heritage

- Scotland has a rich historic environment with a variety of sites and assets, some of which are protected by international, national or local designations and some that are undesignated.
- Assets of historic value include buildings, sites of archaeological significance, battlefields, townscapes and landscapes
- Scotland's heritage is a key factor in the country's significant tourism industry

Landscape and Visual Amenity

- Scotland has an array of stunning landscapes and sceneries, including important protected sites, such as two National Parks and 40 National Scenic Areas (NSAs)
- Scotland's landscape character is very diverse. This is described and mapped in the Landscape Character Assessment of Scotland, commissioned by NatureScot (formerly SNH)
- Scotland's planning system safeguards the special qualities of NSAs, with SNH acting in an advisory capacity
- Scotland's landscapes play a valuable role in Scotland's cultural heritage and contributing to the economy by attracting tourism

4.3. Inter-relationships between SEA Topics

As set out in the Scottish Government's SEA Guidance (2013) and Scottish SEA Regulations, the inter-relationship of environmental effects between the topics has been considered within the SEA. The Guidance states that 'When considering interrelationships and secondary effects, the assessment would only have to consider the effects that can reasonably be attributed to the plan. Interactions arising from external factors, beyond the control of the plan, do not need to be included.' Figure 4 sets out the key inter-relationships of environmental effects that could reasonably arise as a result of STPR2. These interrelationships have been explored in more detail in the detailed baseline review of **Appendix C (National Baseline)**. These inter-relationships have been tailored to consider only what are considered significant interrelationships for STPR2. Some inter-relationships identified in Figure 4 have the potential to result in a cumulative effect, which are discussed in **Section 7.8**.

	Climatic factors	Air quality	Population and human health	Material assets	Water environment	Biodiversity	Soils	Cultural heritage	Landscape and visual amenity
Climatic factors									
Air quality	✓								
Population and human health	✓	✓							
Material Assets	✓		✓						
Water environment	✓		✓	✓					
Biodiversity	✓	✓	✓	✓	✓				
Soils	✓		✓	✓	✓	✓			
Cultural heritage	✓		✓		✓		✓		
Landscape and visual amenity	✓	✓	✓	✓	✓	✓	✓	✓	

Figure 4: SEA Topic Interrelationships

5. Stakeholder Engagement

5.1. Overview

Effective collaboration with stakeholders and engagement with the public has been vital to STPR2 and a considerable programme of activities has been undertaken at a national and regional level throughout the STPR2 process. A comprehensive Engagement Plan was developed during the inception phase to guide engagement and communications with the following principles agreed to set the tone of the message portrayed to key stakeholders and ensure the project team adhere to best practice and offer a consistent approach across the regions as well as nationally in all engagement activities. The principles agreed are as follows:

- A fully transparent and auditable approach to capturing engagement through promotion of fair access - an equal opportunity to become involved - using a range of engagement and communications approaches;
- A proactive approach to elicit responses from diverse stakeholders, including hard to reach groups;
- A consistent approach whilst responding to the diverse geography of Scotland;
- An efficient approach to make best use of finite resources and timescales and minimise engagement/consultation fatigue; and
- An integrated approach between engagement on NTS2, STPR2 and NPF4 where possible and appropriate.

As part of Transport Scotland's commitment to collaborative working, Regional Transport Working Groups (RTWGs), have been established across Scotland with local authorities, National Park authorities and Regional Transport Partnerships (RTPs) to inform and guide the review in their respective areas. RTWGs feature representatives covering a variety of remits, including transportation, planning and economic development. The STPR2 RTWGs and the STPR2 regions they cover, as shown in **Error! Reference source not found.** are as follows:

- Argyll & Bute RTWG – Argyll & Bute Region;
- Ayrshire & Arran RTWG – Ayrshire & Arran Region;
- Edinburgh & South East RTWG - Edinburgh & South East Region;
- Forth Valley RTWG – Forth Valley Region;
- Glasgow City Region RTWG – Glasgow City Region;
- Highlands and Islands RTWG – Highlands and Islands Region;
- North East RTWG – North East Region;
- Tay Cities RTWG – Tay Cities;
- Shetland Islands RTWG – Shetland Islands Region; and
- South of Scotland RTWG – South West Scotland Region & Borders Region.

Before the pandemic, the engagement with the RTWGs was complemented by a comprehensive programme of stakeholder and public engagement activities building on the engagement work undertaken for NTS2. Regional workshops played a very important role in bringing together transport users, business, equality and other representative groups to provide their input on problems and opportunities in the first round of sessions and into potential interventions in the second round of sessions. Structured interviews were also undertaken with a range of key stakeholders to provide additional inputs.

A number of national workshops were also arranged focussing on all the key modes of

transport, including active travel, bus, rail, maritime, road and freight transport. There was also a national equalities workshop and a national environmental workshop. A number of breakfast seminars were arranged in different parts of Scotland for organisations representing key business sectors. Engagement activities were also undertaken with a number of schools in different parts of Scotland.

An online survey to capture the views of the wider public, community councils and organisations with an interest in transport ran from 2 December 2019 to 10 January 2020. Similar surveys have also been completed in three earlier Pre-Appraisal studies in the South West, the Scottish Borders and North East Region.

All the information from the various workshop sessions and the online survey was captured and fed into the Case for Change and option generation phases of work.

From March 2020, stakeholder engagement needed to be paused due to the COVID-19 pandemic, with Transport Scotland resources being focussed on supporting Ministers' response to the pandemic. Stakeholder engagement was re-started in October 2020 to feed into the remainder of the STPR2 process.

Following the publication of the Phase 1 Recommendations Report (Jacobs Aecom 2021a), the regional Case for Change reports, and the Option Sifting Chapter and Covid-19 Addendum of the National Case for Change Report (Transport Scotland, 2021a), comment forms were published in February 2021 to capture feedback. In total 276 Individuals and 118 Organisations provided feedback on the National Case for Change Options Chapter and Covid-19 Addendum and the Phase 1 Recommendations Report (Jacobs Aecom 2021a). The comments received have been considered and have helped to inform the recommendations and options taken forward for more detailed appraisal as part of the remainder of the review.

The STPR2 Final Report will be consulted on for 12 weeks. All feedback received will be collated and reviewed and used to inform a Delivery Plan. The Delivery Plan is expected to consider issues including the prioritisation and programming of the STPR2 recommendations; the approach to partnership working; proposals for delivery; proposals for funding; and future review process and timescales. In addition, the feedback received will be used to inform and finalise the final version of this Environmental Report and inform the SEA Post Adoption Statement.

Figure 5 provides an overview of the key elements of the STPR2 engagement process.



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AND IMPROVING LIVES



**STPR2 ENGAGEMENT AND
CONSULTATION IN NUMBERS**



Figure 5: STPR2 Public and Stakeholder Engagement

6. SEA Consultation Requirements

The SEA consultation is an integral part of the plan-making process. Consultation Bodies and the public are consulted in ways and at times which give them an early and effective opportunity within appropriate timeframes to express their opinions on the draft STPR2 and SEA. The consultation requirements for plans such as STPR2 (based on ODPM, 2005) are as follows:

- Screening and Scoping - Consult Consultation Bodies (NatureScot, Historic Environment Scotland, Scottish Environmental Protection Agency) (completed)
- Environmental Report and draft plan or programme - Consult Consultation Bodies and public. Normally this is one web-based consultation (SEA Gateway), for a 12-week period
- During preparation of plan or programme - Take account of Environmental Report and opinions expressed
- Adopted plan or programme: statement and measures concerning monitoring - Issue to Consultation Bodies and public for information

6.1. Feedback from SEA Consultation Authorities

The SEA has been developed to incorporate the feedback from the three statutory Consultation Authorities in Scotland:

- Scottish Environment Protection Agency (SEPA);
- NatureScot; and
- Historic Environment Scotland (HES).

The role of the Consultation Authorities within SEA is to bring their individual environmental expertise to the assessment process. This can help to ensure that the future consultation process undertaken by a Responsible Authority (in this case Transport Scotland) is more robust. This in turn means that the public can gain a better understanding of the likely effect of a plan on the environment and meaningfully contribute to the plan's preparation process by offering an informed view (Scottish Government, 2013).

6.1.1. SEA Scoping Report Feedback

A Scoping Report was issued to the Consultation Authorities between December 2019 and February 2020 for comment. Feedback was sought on whether the baseline and policy information presented was comprehensive and the proposed methodology appropriate. In their responses (HES, 2020; SEPA 2020 and SNH 2020) The three statutory Consultation Authorities were content with the approach but provided further detail on additional baseline and policy, which have since been updated and are presented in this Environmental Report (Appendices B, C and D). Specific comments were made on the assessment objectives (hereafter referred to as SEA objectives) and these were taken on board when finalising the assessment framework. It was highlighted that any reasonable alternatives identified during the preparation of the plan should be assessed as part of the SEA process and the findings of the assessment should inform the choice of the preferred option. The full SEA response to the consultees' Scoping feedback is provided in **Appendix E (Consultation Feedback)**.

6.1.2. SEA Progress Report Feedback

An STPR2 SEA Progress Report was issued to the Consultation Authorities between February and April 2021. This report provided a summary of the STPR2 and SEA work undertaken to date. It also included an update to the proposed SEA assessment methodology and signposted the next phase of assessment and opportunities for input into the final STPR2 and SEA Environmental Report. Consultation feedback was received from NatureScot and HES in March 2021 (HES, 2021a; NatureScot 2021).

NatureScot supported the publication of the Progress Report as it was considered helpful due to the lengthy process of STPR2 and the impacts of the Covid-19 pandemic.

The plan to embed natural capital principles into appraisal mapping requirements, as well as placing a stronger focus on place and placemaking, was also supported by NatureScot. They believe that it will be useful for the SEA process to address areas for embedding nature-based solutions for all interventions. NatureScot recommended that the three-point scoring system should be replaced by the seven-point system described in **Section 7.3** of this report.

NatureScot also welcome the mitigation and enhancement measures provided in the SEA Progress Report. However, they requested that the SEA should make specific reference to opportunities which would deliver Positive Effects for Biodiversity and nature-based solutions.

Historic Environment Scotland (HES) submitted a response on the 30th of March 2021 to the Phase 1 Recommendations for the STPR2 and updates on the SEA issued on the 4th of February 2021. The following text provides a summary of the main points.

In relation to the STPR2 update and Phase 1 Recommendations, HES agreed with the general phasing approach for STPR2 and the general themes and transport investment priorities. However, HES commented that the implications to the historic environment in Phase 1 do not encompass the full potential range of impacts, particularly in relation to:

- Enhancing Major Rail Stations (now included as Recommendation 43 – Major Station Masterplans)
- Infrastructure to provide access for all at rail stations (Recommendation 19)
- Delivery of Rail Decarbonisation Programme (Phase 1) (Recommendation 25)
- Infrastructure to encourage rail freight

HES are engaging with stakeholders in attempt to look at design options to help improve access at historic stations. They also seek to continue collaboration to ensure the interventions are implemented in a way which minimises impact to historic assets and HES wish to be involved at a strategic stage.

In response to the SEA Progress Report, HES discussed how they were unable to comment on the effectiveness of the assessment process due to lack of detail of the high-level findings presented to them. The summaries of the potential interactions of the interventions with the SEA objectives were supported by HES, however, due to a lack of detail, further comments could not be provided. HES mention how the approach lacks in recognising the complexity of environmental implications for the historic environment across several of the interventions. Some examples of potentially significant effects which the summaries failed to include are the implications of access work and electrification.

HES recommended that the proposed matrix approach for the preliminary appraisal should recognise that proposed interventions such as major rail station enhancement may

contribute positively and negatively to the SEA objectives. The scoring system for the detailed appraisal stage should therefore be flexible enough to allow the scoring of positive and negative effects.

SEPA were unable to provide feedback to the SEA Progress Report due to a cyber-attack in December 2020 that affected SEPA's systems for several months.

The full consultation feedback on the SEA Progress Report and the SEA response to this feedback is provided in **Appendix E (Consultation Feedback)**.

6.2. SEA Workshops

Seven national workshops were held throughout August and September 2019, with an Environment-Specific Workshop held on the 22nd August. These workshops build on existing relationships established for the NTS2 Review but were tailored to ensure that attendees were the best fit for the purposes of STPR2. The workshops provided an opportunity to identify any data gaps and understand work being undertaken by a wide range of organisations. The National Environment Workshop was attended by various national bodies in Scotland whose remit includes environmental issues, including:

- The SEA Consultation Authorities (SEPA, NatureScot, HES);
- NTS2 team;
- Crown Estate;
- Marine Scotland;
- Architecture and Design Scotland; and
- Crofters Commission.

Feedback received from these bodies has been incorporated into the SEA methodology (see **Chapter 7: The Approach to the Assessment**) through an expanded discussion of 'problems' in the SEA baseline (see **Chapter 4 (Baseline Summary)** of this report) and improved description of 'opportunities', which are provided in the mitigation and enhancement included in **Chapter 9 (Strategic Mitigation and Enhancement)** of this report.

Other national-level workshops also produced useful environment-related information to inform the SEA. The most relevant workshops with useful outputs for the SEA were those dedicated to active travel and EqlA. The active travel workshop identified:

- Data on modal share statistics, physical activity, health inequalities and safety to consider in the SEA baseline data under the 'Population and Human Health' topic; and
- Funding mechanisms that could be considered in STPR2 enhancement recommendations at the Environmental Report stage.

The EqlA workshop identified:

- Data on socio-economic inequalities in relation to CO₂ emissions;
- Socio-economic inequalities in relation to active travel; and
- Opportunities that have been considered in the STPR2 enhancement recommendations are provided in Chapter 7 of the EqlA report (Jacobs Aecom 2022a).

A second workshop with the Consultation Authorities was held in September 2019 to refine the SEA methodology (see **Chapter 7: The Approach to the Assessment**), including the framework of SEA objectives to use in the assessment. Feedback from the Consultation Authorities on these has been incorporated into the draft SEA objectives presented in **Section 7.3** of this report.

During the course of STPR2, there has been extensive stakeholder and public engagement to identify problems and opportunities around the country. Feedback from all of the regional and national workshops was reviewed to identify environmental issues and opportunities which would be pertinent to the SEA.

These workshops were followed up with a similar number of regional sessions in late 2019/early 2020 to explore potential options. A comprehensive school engagement programme with over 600 pupils from across Scotland also resulted in a range of options being identified. In parallel with these general sessions, a number of more targeted national workshops were held in August 2019, focusing on particular modes or sectors of the community. An online national public survey also took place in summer 2019 to identify problems and opportunities, for which in excess of 3000 responses were received.

An HRA-focused workshop was held with NatureScot in November 2020, to discuss the proposed approach to the HRA.

An SEA and EqIA webinar was also held for the Regional Transport Working Groups on 12th May 2021 to provide an update on Impact Assessment progress and approach to the preliminary and detailed appraisals.

Further workshops were held with the SEA Consultation Authorities in November and December 2021 to provide an update on STPR2 and SEA progress.

Relevant feedback received from all these engagement activities has been incorporated into the SEA methodology through an expanded discussion of constraints and opportunities in the SEA policy review and baseline, provided in **Appendix B (Plans, Programmes and Strategies)**, **Appendix C (National Baseline)** and **Appendix D (Regional Environmental Summaries)** of this Environmental Report.

7. The Approach to the Assessment

7.1. Assessment Overview

The SEA process provides robust inputs to consider in the 'Environment' criterion within wider STAG appraisal. It is considered that this is the best way to ensure SEA influence throughout the development of STPR2 and has also facilitated the identification and assessment of reasonable alternatives at each stage of the STAG process.

The SEA process and programme aligns with the EQIA (and related assessments, described in **Section 1.4**) and in some cases matches the approach used for both the NTS2 SEA and NPF4 SEA to ensure consistency. For example, the NPF4 also produced an Integrated Impact Assessment progress update in November 2020.

Due to the high importance of the climate change topic, the importance of greenhouse gas emissions in the transport sector and the need to achieve net zero targets (as set out in **Section 3.3**), the specific SEA approach for carbon is also discussed in this chapter.

7.2. Scope of Assessment

Following the baseline and PPS review, it was determined that there could be positive and/or negative impacts on all of the SEA topics. As a result, they were all scoped into the assessment. The SEA topics and their justification for inclusion in the scope of the SEA is shown in Table 2. This table was presented in the Scoping Report and reflects comments made through the scoping consultation responses provided in **Appendix E (Consultation Feedback)**.

Table 2: Scoping of SEA Topics

TOPIC	SCOPED IN/OUT	COMMENT
Air Quality	In	As STPR2 is transport-focused, it has the potential to cause negative impacts on air quality through transport emissions. However, it also has the opportunity to deliver significant positive impacts with reduced emissions through encouraging modal shift to more sustainable, low-carbon modes of transport.
Climatic Factors	In	As STPR2 is transport-focused it has the potential to influence the future levels of greenhouse gas emissions associated with Scotland's transport network. It also has the potential to improve the resilience of the network to the impacts of climate change.
Population and Human Health	In	STPR2 has the opportunity to deliver significant positive impacts on physical health through policies related to active travel and a shift to more sustainable modes of transport (i.e. improve air quality). STPR2 also has the opportunity to consider and respond to demographic changes and reduce social inequalities.

TOPIC	SCOPED IN/OUT	COMMENT
Cultural Heritage	In	STPR2 has the potential to have both significant positive and negative impacts on designated or undesignated heritage assets – for example, through the implementation of physical transport interventions in proximity to them. It also has the potential to have positive impacts on improving access to and understanding of the historic environment.
Material Assets	In	STPR2 has potential to have significant positive impact on existing transport infrastructure and green infrastructure through policies that reduce the need to travel, encourage a modal shift to more sustainable modes of transport or otherwise influence the environmental impacts of the transport network. Any physical interventions on the ground will also have implications for mineral, aggregate and fossil fuel resources.
Landscape	In	STPR2 has the potential to have both significant positive and negative impacts on designated or undesignated landscapes, for example through the implementation of physical transport interventions in proximity to them.
Water	In	STPR2 has potential to have a positive impact on resilience/ flood protection measures for existing and proposed transport infrastructure, for example through interventions that improve the use of Sustainable Drainage Systems on the transport network or increase green infrastructure that could aid pollutant filtration.
Biodiversity, Flora & Fauna	In	STPR2 has the potential to have both significant positive and negative impacts on designated or undesignated biodiversity sites. For example, through the implementation of physical transport interventions in proximity to them.
Soil	In	<p>STPR2 has potential to have a positive impact on soil resources for existing and proposed transport infrastructure, for example through interventions that improve the use of Sustainable Drainage Systems on the transport network or increase green infrastructure that could aid pollutant filtration. STPR2 interventions could also negatively affect Scotland’s soil resources, for example causing compaction, sealing or erosion. Soil also interacts with various other aspects of the environment – in particular, it supports biodiversity.</p> <p>It could also potentially promote the use of brownfield vs. greenfield sites for new transport interventions and therefore influence the environmental, agricultural and soil carbon storage implications of the interventions.</p>

7.3. SEA Objectives and Assessment Guide Questions

The SEA assessments have been carried out using a set of SEA objectives and assessment criteria, that cover each of the environmental topics. These form the assessment framework which has been used to determine the likely significant effects of STPR2. The SEA objectives and assessment criteria identified in Table 3 have been developed from:

- a comprehensive review of the baseline issues and policy requirements;
- a gap analysis review of the STAG criteria; and
- recent feedback received from the SEA Consultation Authorities (NatureScot, SEPA and HES) – **see Appendix E (Consultation Feedback)**.

Table 3 below provides an overview of the SEA objectives and guide questions used to determine the likely significant effects of STPR2 according to each SEA topic, and also lists the overarching data sources used to aid these assessments.

Table 3: SEA Objectives and Assessment Criteria

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Climatic Factors	Reduce emissions from Scotland’s transport sector by reducing the need to travel and encouraging modal shift and help meet Scotland’s wider targets to reduce greenhouse gas emissions.	<p>Contribute to achievement of Scotland CO₂ emissions reduction target of net zero by 2045?</p> <p>Commit to a monitoring programme for reviewing international low carbon best practice and emerging technologies?</p> <p>Promote and support the best use of clean fuels/technologies (e.g. strategic planning of EV charging points or hydrogen refuelling considerations)?</p> <p>Promote and facilitate reduction of car kilometres and modal shift to more sustainable transport options?</p> <p>Promote behavioural change within workplaces, including car sharing, flexible work patterns and supporting opportunities for home working?</p> <p>Facilitate ongoing co-ordination with spatial development planners to ensure communities are close to key services and places of employment, to the maximum extent possible?</p>	Transport Scotland modal share data, workplace travel plans etc

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
	<p>Adapt the transport network to the predicted effects of climate change.</p>	<p>Help adapt the transport network to direct and indirect risks associated with climate change projections for Scotland?</p> <p>Prioritise adaptation of transport infrastructure in locations that are more vulnerable to the projected impacts of climate change, including coastal and isolated locations?</p> <p>Prioritise adaptation of transport connections to critical infrastructure, including transport interchanges, hospitals, power, fuel supply and ICT Infrastructure?</p> <p>Maintain or improve access to and within disadvantaged areas or isolated communities at risk from climate change impacts e.g. flooding, slope instability?</p>	<p>UK Climate Change Risk Assessment 2017 Evidence Report: https://adaptationscotland.org/why-adapt/legislation/uk-climate-change-risk-assessment.</p> <p>SNH 'Dynamic Coast' guidance: https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=NCCA.</p> <p>Indices of Multiple Deprivation: https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020/</p> <p>Transport Scotland's 'Fitting Landscapes' policy (Aim 4: Build in adaptability to change): https://www.transport.gov.scot/media/33663/j279083.pdf</p> <p>NTS2 Delivery Plan: https://www.transport.gov.scot/media/48839/nts-delivery-plan-2020-2022.pdf</p>

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Air Quality	Reduce all forms of transport-related air pollution and improve air quality throughout Scotland.	<p>Encourage and facilitate the use of active travel, particularly for short journeys?</p> <p>Help to reduce traffic congestion?</p> <p>Limit the more polluting vehicles in sensitive areas e.g. AQMAs?</p> <p>Improve or at least maintain air quality in disadvantaged areas?</p> <p>Help to limit polluting traffic growth?</p> <p>Reduce emissions of key air pollutants (NO_x, particulates, SO₂) from all forms of transport, but focusing on the most polluting vehicles and areas of known poor air quality e.g. diesel emissions in urban areas?</p> <p>Promote green infrastructure at all spatial scales, to help remove pollutants from the air?</p>	<p>AQMAs – location and reasons for designation.</p> <p>Other areas known to have poor air quality but as yet undesignated</p> <p>Areas mapped for the Indices of Multiple Deprivation</p>
Population and Human Health	Improve quality of life and human health and increase sustainable	<p>Encourage sustainable access to the natural and historic environment?</p> <p>Reduce and avoid community severance or other detriment to existing active travel routes,</p>	<p>Mapping of open spaces</p> <p>Mapping of significant walking and cycling routes</p>

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
	<p>access to essential services, employment and the natural environment.</p>	<p>including maintaining or improving pedestrian crossings?</p> <p>Ensure safe and sustainable access for all users to essential services and employment?</p> <p>Increase and enhance provision of non-motorised transport, especially walking and cycling links and facilities?</p> <p>Promote linking up existing or planned new communities through the active travel network?</p> <p>Plan for future capacity of active travel network, taking into account demographic or other changes?</p> <p>Provide increasing transport choice that meet the needs of the population?</p> <p>Allow for greater journey time reliability?</p> <p>Support changing demographics by providing appropriate transport facilities to meet their needs?</p> <p>Improve accessibility to open spaces and the path network for</p>	

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
		physical recreational purposes? Improve access to healthcare facilities?	
	Reduce noise and vibration associated with the transport network.	Reduce noise and vibration on the transport network particularly at sensitive locations?	
	Promote, invest in, build and maintain infrastructure to support the development of high-quality places.	Support the development of places that feel safe to all users? Prioritise pedestrians in the public realm? Support the creation and maintenance of an attractive public realm, with a focus on the contribution of transport infrastructure?	
	Improve safety on the transport network.	Reduce the likelihood of transport-related road accidents and casualties?	

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Material Assets	Promote and improve the sustainable use of the transport network.	<p>Support improvements to transport technology, interchanges and timetabling?</p> <p>Plan for future travel arrangements where journeys are made by a number of different modes (e.g. electric vehicle for most of the journey, which is then parked and left to charge at a hub, cycle and walking assets, such as connected off-road paths, bike/e-bike share infrastructure)?</p> <p>Plan for future capacity of public transport, taking demographic and other societal changes into account?</p> <p>Promote sustainable use and management of existing infrastructure e.g. water, heat, energy or flood protection infrastructure?</p>	Mapping of existing transport interchanges
	Reduce use of natural resources.	Ensure transport infrastructure and innovation delivers/contributes to the circular economy?	

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Water Environment	Protect, maintain and improve the quality of water bodies and wetlands that could be directly or indirectly affected by transport infrastructure (with respect to Water Framework Directive targets) and protect against the risk of flooding.	<p>Support and enhance the network of blue and green infrastructure?</p> <p>Ensure transport network resilience to climate change and flood risk?</p> <p>Constrain any water bodies from achievement of Good Ecological Status/Good Ecological Potential under the Water Framework Directive (WFD)?</p> <p>Increase the risk of diffuse pollution from current or increasing traffic volumes?</p> <p>Improve the quality of surface water draining from the transport network (e.g. reducing salt spreading in winter, expanded or improved Sustainable Drainage System network)?</p> <p>Increase development that physically impacts on a waterbody, watercourse or the coastline?</p> <p>Promote removal of artificial transport-related structures in water bodies (e.g. bridge piers, concrete slipways)?</p> <p>Promote natural flood management techniques?</p>	<p>Mapping of green and blue infrastructure</p> <p>Maps showing the WFD status of water bodies adjacent to transport infrastructure</p>

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Biodiversity	Protect, maintain and enhance biodiversity and ecosystem services, avoiding damage to or loss of designated and undesignated wildlife or geological sites.	<p>Protect and/ or enhance the integrity of any site of biodiversity or geological value that has been designated at international, national or local levels (e.g. land take, fragmentation or indirect degradation)?</p> <p>Protect and or enhance the integrity of existing habitat and green/blue networks and other wildlife corridors (including the ecological connections between separate Natura 2000 sites and 'landscape-scale' corridors)?</p> <p>Maintain or upgrade transport network to remove barriers to wildlife movement?</p> <p>Reduce the risk of spreading invasive non-native species?</p> <p>Provide opportunities to provide positive effects for biodiversity e.g. habitat creation or enhancement?</p> <p>Align with the strategic goals of the Aichi Biodiversity Targets and 2020 outcomes for Scotland?</p>	<p>Mapping of designated biodiversity and geological sites</p> <p>Mapping of green and blue infrastructure</p> <p>Aichi Biodiversity Targets and 2020 outcomes for Scotland: https://www.nature.scot/scotlands-biodiversity-progress-2020-aichi-targets-conserving-genetic-diversity-development-national</p>

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Soil	Safeguard and improve soil quality in Scotland, particularly high value agricultural land and carbon-rich soil.	<p>Avoid and minimise disturbance of rare soils, high-carbon (including peat) and wetland soils and productive agricultural land?</p> <p>Avoid indirect impacts on off-site peat and wetland soils to maintain natural processes of hydrological and ecological regimes?</p> <p>Avoid or minimise land take of greenfield sites?</p> <p>Reduce risk of soil sealing, contamination or erosion on a significant scale?</p>	<p>SNH peat map classification</p> <p>Mapping of significant brownfield and/or contaminated sites</p> <p>Maps of soil erosion risk (partial coverage of the country) available on Scotland’s soils website</p> <p>Land capability for agriculture maps (partial coverage)</p> <p>Carbon and peatland map 2016</p>

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Cultural Heritage	Protect and enhance (where appropriate) historic and archaeological sites and other culturally and historically important features, landscapes and their settings.	<p>Avoid significant effects (direct or indirect) on designated or undesignated archaeological sites, as well as other culturally and historically important features, including Conservation Areas, inventory sites for Battlefields and Gardens and Designed Landscapes?</p> <p>Protect key views to and from heritage assets?</p> <p>Improve access to the historic environment?</p>	Mapping of designated heritage sites or known areas of historic significance or archaeological potential

SEA TOPIC	SEA OBJECTIVE	SEA ASSESSMENT GUIDE QUESTIONS DOES THE STPR2 OPTION...?	OVERARCHING DATA SOURCES TO AID ASSESSMENT (OTHER THAN THOSE IDENTIFIED IN STPR2)
Landscape and Visual Amenity	Safeguard and enhance the character and diversity of the Scottish landscape and areas of valuable landscape.	Align with the four key aims of Transport Scotland’s ‘Fitting Landscapes’ policy (1. Ensure high quality of design and place; 2. Enhance and protect natural heritage; 3. Use resources wisely; 4. Build in adaptability to change)? Avoid significant effects (direct or indirect) on National, Regional and Local Landscape designations and mitigate where appropriate? Protect wild land areas?	Transport Scotland’s ‘Fitting Landscapes’ policy Mapping of designated landscapes, including National Parks and National Scenic Areas https://www.nature.scot/wild-land-area-descriptions SNH Landscape Character Assessment: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

7.4. Consideration of Reasonable Alternatives

The Act requires the Environmental Report to identify and assess any reasonable alternatives to the plan or programme, taking into account its objectives and geographical scope. According to Scottish Government (2013) guidance, alternatives must be realistic and are likely to emerge from the plan-making process.

Given the wider policy context and legislative landscape within which transport sits, and the supporting role transport plays in the delivery of multiple outcomes, a “do nothing” scenario or a change in focus of STPR2 are not considered “reasonable alternatives” to delivering the main objectives of the strategy. Instead, reasonable alternatives have been considered at the key (STAG) stages of STPR2, particularly at the following stages:

- Preliminary Appraisal – Consideration of impacts of grouped options against alternative appraisal scenarios
- Detailed Appraisal – consideration of alternative options/interventions

At the Preliminary Appraisal stage, reasonable alternatives were primarily focused on refinements to policy/ wording, intervention options, caveats and monitoring controls, based on the SEA Objectives and their underlying assessment guide questions. At this stage, many draft interventions that would be considered to be reasonable alternatives were removed from further consideration as they did not score well against the TPOs or the SEA Objectives.

At the Detailed Appraisal stage, the principal consideration of reasonable alternatives has been in the assessment of mode-based groupings (defined in the glossary) of transport interventions against alternative appraisal scenarios. These are based on two Transport Behaviour Variants, as follows:

- High Transport Behaviour - capturing ‘without policy ambitions’ leading to High levels of motorised traffic demand/emissions.
- Low Transport Behaviour – capturing ‘with policy ambitions’ leading to Low levels of motorised traffic demand/emissions.

The Transport Behaviour Variants contain elements of travel behaviour change that have been accelerated by the COVID-19 crisis, for example increased working from home. One variant (low transport behaviour) also includes what could be described as ‘with outcome’, in that it describes how the 20% reduction in car vehicle kilometres by 2030 and net zero by 2045 can be achieved. The variants can be broadly categorised as ‘high motorised travel’ and ‘low motorised travel’ futures. Further detail on these Transport Behaviour Variants is provided in the STPR2 Final Report.

Appendix F (Assessment Matrices) of this Environmental Report shows the alternative interventions considered and how the Transport Behaviour Variants were assessed in the matrix, using the SEA objectives and their underlying guide questions, as listed in **Section 7.3**.

7.5. Stages of Assessment

It is recognised that the environmental topics of STAG do not fully cover the full range of SEA topics and sub-topics, as described in **Section 7.2** and **Section 7.3**. However, the SEA, EqIA and other supporting assessments will continue to align with each STAG stage, as this ensures the SEA is able to maximise its influence in the overall assessment process. Table 4 sets out how the SEA process aligns with STAG’s four-stage assessment process, as described in **Section 2.3**.

Following each stage of assessment, any potentially negative impacts identified have been discussed with the project team to consider reasonable alternatives, effective mitigation and enhancement recommendations. The key recommendations are likely to include refinements to objectives, policy/wording, intervention options, caveats and monitoring controls based on the environmental criteria considered. The recommendations respond not only to direct impacts but also indirect, secondary and cumulative impacts.

Cumulative impacts have been considered at both intra-plan (the impact of a combination of interventions) and the inter-plan level (the impact of the plan alongside other plans and policies), as described in **Section 7.8**.

Following the SEA assessments, relevant findings and recommendations are recorded in summary form for inclusion in **Chapter 8 (Assessment Results)** of this report, with assessment matrices provided in **Appendix F (Assessment Matrices)**.

Table 4: SEA Inputs at Each Stage of STAG

STAG	SEA INPUT
<p>Initial Appraisal: Case for Change (July 2020 to February 2021)</p>	<p>While the environment is not traditionally considered in any depth at this stage, the SEA team provided sufficient information on the baseline national and regional environmental constraints and environmental policy to influence the development of both national and regionally specific TPOs. This ensured that the TPOs were compatible with the SEA objectives.</p> <p>The TPO’s developed for the three advanced regions: Borders, North East and South West were also reviewed and checked against the SEA objectives to ensure compatibility.</p> <p>This approach was reinforced by the Scottish Government’s declared Climate Emergency in 2019, and the contribution from transport to national emissions, highlighting the importance of embedding environmental considerations at this stage.</p> <p>This Initial Appraisal: Case for Change took place alongside the SEA Scoping Stage.</p> <p>SEA input and high-level environmental commentary of each transport ‘option’ was provided during the initial sift in August 2020, to highlight any significant environmental constraints or opportunities. Key environmental constraints and opportunities, including mapping, were also provided in discrete sections of the regional Case for Change reports published in February 2021 (Transport Scotland, 2021a).</p>

STAG	SEA INPUT
<p>Preliminary Appraisal (May to October 2021)</p>	<p>During Preliminary Appraisal, a matrix-based assessment was undertaken using the SEA objectives/assessment questions to guide the assessment of the long list of STPR2 draft transport interventions. This long list included the options from the three advanced regions. The matrix utilised a seven-point scoring system, as presented in Section 7.6, to align with STAG criteria and SEA requirements.</p> <p>This is standard practice for scoring options/groupings against SEA objectives and scores were applied ranging from the options being likely to contribute significantly to achieving an objective to it having a significant long-term negative impact on the objective. The assessment considered likely significant effects, mitigation, assumptions and uncertainties where relevant.</p>
<p>Detailed Appraisal (November – December 2021)</p>	<p>The SEA has undertaken the environmental component of the STAG assessment with a more detailed assessment against aligned STAG/SEA topics using SEA objectives/assessment questions to guide assessment.</p> <p>The assessment at the Detailed Appraisal stage has continued to use a 7-point scoring system applied at Preliminary Appraisal to align with STAG criteria and SEA requirements.</p> <p>The Detailed Appraisal has focused on packages of interventions and the final STPR2 ‘recommendations.’ The Detailed Appraisal is provided in Appendix F (Assessment Matrices) of this report, which is summarised in Chapter 8 (Assessment Results) of this report.</p> <p>Mitigation measures have been identified, and the assessment considers indirect, direct and cumulative effects. Enhancement opportunities are also described.</p> <p>Mitigation and enhancement measures are provided in Chapter 9 (Strategic Mitigation and Enhancement) of this report.</p>
<p>Post Appraisal: Monitoring and Evaluation (Spring/ Summer 2022)</p>	<p>The SEA will produce a Post Adoption Statement, following the formal adoption of STPR2 including the finalised, detailed Monitoring Framework. This will take account of the consultation comments and provide a narrative as to how the SEA has influenced the final STPR2.</p>

7.6. Matrix Approach

The SEA process has used a matrix-based approach, with a qualitative scoring system to identify likely significant effects on the SEA objectives. The seven-point scoring system used for the assessment of effects in the preliminary and detailed appraisal stages is described in Table 5. This approach has several advantages, including the systematic recording of potential effects and their significance, with a narrative accompanying each score to explain the rationale for scoring and the predicted impacts.

Table 5: SEA Scoring System for the Detailed Appraisal Stage

SCOPE	DESCRIPTIONS	SYMBOL
Significant Positive Effect	The proposed option contributes significantly to the achievement of the SEA objective.	++
Minor Positive Effect	The proposed option contributes to the achievement of the SEA objective but not significantly.	+
Neutral Effect	The proposed option is related to but does not have any effect on the achievement of the SEA objective	0
Minor Negative Effect	The proposed option detracts from the achievement of the SEA objective but not significantly.	-
Significant Negative Effect	The proposed option detracts significantly from the achievement of the objective. Mitigation is therefore required.	--
Uncertain Effect	The proposed option has an uncertain relationship to the SEA objective or the relationship is dependent on the way in which the aspect is managed. In addition, insufficient information may be available to enable an assessment to be made.	?
No or negligible relationship	There is no clear relationship between the proposed option and the achievement of the SEA objective or the relationship is negligible.	~

Following each stage of assessment, any potentially negative impacts identified have been discussed with the project team to consider reasonable alternatives, effective mitigation and enhancement recommendations. Recommendations respond not only to direct impacts but also indirect, secondary and cumulative impacts.

7.7. GIS Mapping

ProjectMapper, a Geographic Information Systems (GIS) tool developed by Jacobs, is an interactive mapping tool which shows environmental constraints, such as designated and undesignated sites. The data which feed into the map have been gathered from publicly available sources and through consulting with the Consultation Authorities and other consultees. ProjectMapper has been used to determine where environmental constraints were present in relation to STPR2 interventions and this has informed the assessment provided in **Appendix F (Assessment Matrices)**.

7.8. Cumulative Effects Assessment

Annex I of the SEA Directive requires that the assessment of effects include secondary, cumulative, and synergistic effects (defined in the Glossary at the start of this report). Scottish SEA Guidance (2013) states that ‘Cumulative effects can be considered in terms of synergistic effects, additive impacts and secondary effects.’ For the purposes of this SEA, the term ‘cumulative effects’ also encompasses synergistic effects.

As stated in the UK Government SEA Guidance, ‘Cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect; or where several individual effects of the plan (e.g. noise, dust and visual) have a combined effect.’ (Office of the Deputy Prime Minister 2005).

Cumulative effects have been considered at both intra-plan (the impact of a combination of STPR2 interventions) and the inter-plan (the impact of the plan alongside other plans and policies). The inter-plan assessment has been undertaken towards the end of the assessment, when the final draft set of STPR2 recommendations was available to consider alongside relevant national level policy/strategy, including NPF4 and the Climate Change Plan Update.

The cumulative assessment across all SEA topics used the following assessment approach to provide an average (modal) score for each package of interventions assessed:

- If more ? than + and – then the average score would be ?
- If more 0 than + and – then the average score would be 0
- If more + than – and ? then the average score would be +
- If more – than + and ? then the average score would be -
- If + or – is equal to ? or 0, then the average score would be + or -, as applicable.
- If more ~ than all other scores, then the average score would be whichever score has the next highest number count after ~
- If there are the same number of + and – with the highest equal count this would represent an exception and have a +/- rating

The assessment matrices showing cumulative effects are provided in **Appendix F (Assessment Matrices)**. This approach to deriving average scores has also been used for the final compatibility check of STPR2 recommendations with the SEA objectives – see **Section 8.4**.

7.9. Climatic Factors and Carbon Assessment Approach

At a strategic level, assessing the carbon impact of multi-modal transport interventions would take the form of a qualitative assessment as opposed to quantitative calculations, which would not be accurate at the strategic planning stage. To carry out a quantitative assessment on an intervention would require detailed information on requirements for construction materials, earthwork volumes and construction methods. This type of information does not tend to be available until any such intervention is at the preferred option stage, where designers are able to provide the level of detail that would feed into a carbon assessment tool. Due to the long lead in time of projects and the constantly evolving landscape, information can quickly become out of date, particularly now with the push for decarbonisation. With regards to STPR2, this makes conducting assessments for a project that could be 20 years away from commencement unreliable and supports the approach to utilise a qualitative method.

Figure 6 shows that the accuracy of carbon assessment is lowest at the strategic planning stage while the ability to influence carbon reduction is highest.

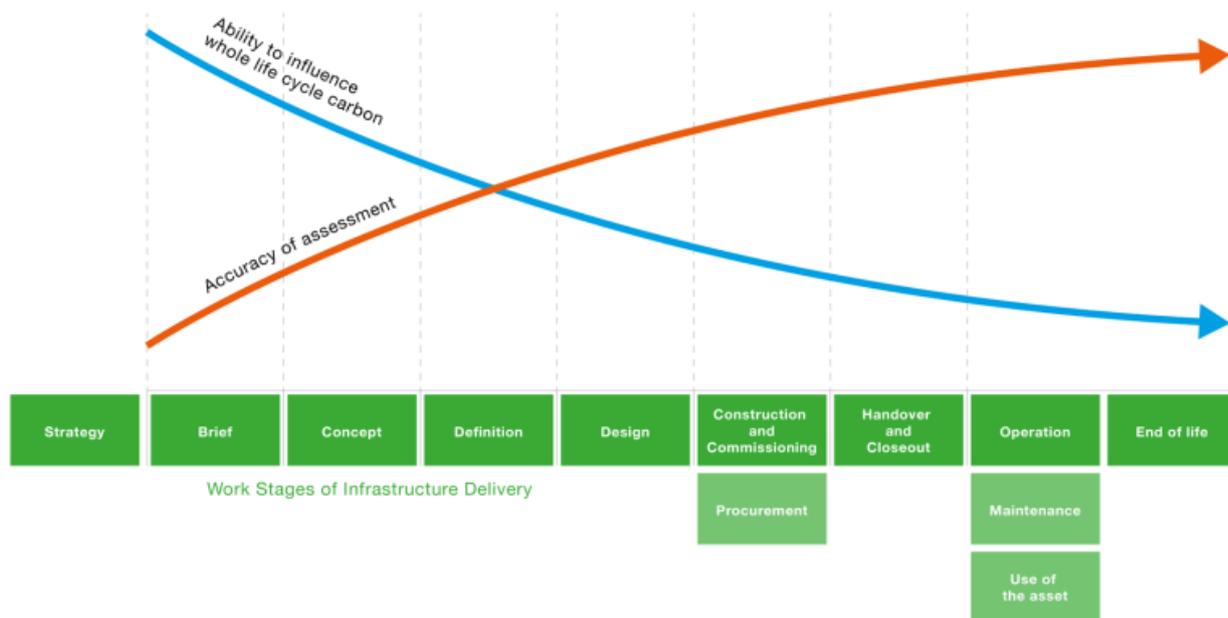


Figure 6: Timing of Carbon Assessment and Ability to Influence (The Fifth Estate, 2020)

The assessment of transport interventions for the Climatic Factors topic follows the same objective-led approach as for the other SEA topics, as described in **Section 7.3**. However, detailed mitigation and enhancement measures in relation to Climatic Factors are provided in **Chapter 9 (Strategic Mitigation and Enhancement)**.

8. Assessment Results

8.1. Phase 1: Approach and SEA Findings

In order to assess and finalise options for assessment as potential Phase 1 measures, a proportionate approach was developed, considering options that could potentially meet the short-term requirements, whilst being guided by the overall STPR2 options list. As stated in **Chapter 1 (Introduction)**, Phase 1 was introduced in order to help expedite the development of interventions that could embed, support and extend the increase in travel by sustainable travel modes, and those that could be brought forward to support economic recovery. The assessment approach was based on STAG, adopting a multi-criteria assessment based on each option's:

- Contribution to STPR2 Objectives (including Environmental and Equality objectives);
- Performance against the COVID-19 priorities for short-term measures; and
- Performance of Deliverability criteria (feasibility, affordability and public acceptability).

Following this approach, the Phase 1 process resulted in 20 interventions being recommended, against eight themes.

A summary of the eight themes and associated interventions recommended from the Phase 1 process is set out within Table 6. Further details can be found within the STPR2 Update and Phase 1 Recommendations Report (Jacobs Aecom 2021a).

Table 6: STPR2 Phase 1 Themes and Recommendations

STPR2 PHASE 1 THEME	THEME DESCRIPTION	RECOMMENDATIONS
Supporting smart and sustainable travel across Scotland	National measures that will support active and sustainable travel choices and placemaking principles	Development and delivery of Active Freeways Expansion of 20mph zones Influencing travel choices
Creating smart and sustainable towns and villages	Packages of sustainable transport improvements to enhance attractiveness and sustainability of our towns and villages	Transport's contribution to placemaking principles in neighbourhoods Guidance and framework for delivering mobility hubs
Improving accessibility in rural and peripheral areas and for vulnerable groups	Improved public transport offering where fixed timetable services do not satisfactorily cover the needs of individuals, including consideration of demand responsive travel	Investment in Demand Responsive Transport and Mobility as a Service

STPR2 PHASE 1 THEME	THEME DESCRIPTION	RECOMMENDATIONS
Transforming Cities	Measures that will support active and sustainable travel alongside placemaking principles in Scotland's seven cities to help transform cities and neighbourhood centres	<ul style="list-style-type: none"> Reallocation of road space for active travel Enhancing facilities at major rail stations (Rail Station Redevelopment) Development of Glasgow Metro & Edinburgh Mass Transit strategies
Enhancing public transport provision	A range of measures to improve the accessibility and reliability of public transport and stimulate a sustainable recovery post COVID-19	<ul style="list-style-type: none"> Reallocation of road space for buses Supporting integrated journeys at ferry terminals Infrastructure to provide access for all at rail stations
Supporting transition to low-carbon transport	Measures that will increase the development and further transition of Scotland's transport fleet to low carbon	<ul style="list-style-type: none"> Investment in low carbon and alternative fuel transport systems Delivery of Rail Decarbonisation Programme (Phase 1)
Supporting a viable freight industry	Measures to improve conditions for the freight and haulage industry to deliver a modal shift	<ul style="list-style-type: none"> Strategy for improving rest and welfare facilities for hauliers Infrastructure to encourage rail freight
Enhancing safety and resilience on the strategic transport network	Package of measures on the strategic transport network focusing on improving safety and resilience	<ul style="list-style-type: none"> Investment in the trunk road network asset Access to Argyll and Bute (A83) Investment in ferries and ports Speed Management Plan

Since the publication of the Phase 1 Report, further work has been carried out to provide additional detail against some of the recommendations listed above, and these have been considered within the SEA findings presented in **Section 8.3**.

The SEA undertook a high-level review of the key STPR2 Phase 1 themes and recommended interventions. This was undertaken to identify whether they each align with the NTS2 and IIP and likely compatibilities / incompatibilities with the SEA objectives.

This high-level review identified that each of the current STPR2 themes and most of the interventions largely align with priorities and key themes set out within NTS2, IIP and the STPR2 SEA objectives.

A secondary scoping of each of the themes and interventions was undertaken to consider potential for significant environmental effects. This determined that a number of the interventions need further detail before they can be assessed. A small number of these interventions were highlighted at this stage as having potential for significant effects on the achievement of the SEA objectives. These interventions have been subject to further consideration and assessment in the SEA. It is noted that for each of these interventions, there is potential for a positive contribution to the achievement of SEA objectives for air quality, climatic factors and population and human health. However, there is uncertainty regarding the potential for some interventions to detract from SEA objectives, depending on their physical location. Some interventions will also require Environmental Impact Assessment at the project level.

8.2. Detailed Appraisal Stage Assessment

Section 8.3 summarises the Detailed Appraisal stage assessment of the final packages of interventions provided as **Appendix F (Assessment Matrices)**. These are summarised into each of the SEA topics. Assessment summaries for each of the STPR2 regions are provided in **Appendix D (Regional Environmental Summaries)**. The regional assessment summaries are also derived from the detailed assessment provided as **Appendix F (Assessment Matrices)**.

Section 8.4 summarises the compatibility assessment of the final 45 STPR2 recommendations against the SEA Objectives.

8.3. Detailed Appraisal: Cumulative effects by SEA Topic

8.3.1. Climatic factors

Overall, most of the draft recommendations are anticipated to result in minor positive effects on reducing greenhouse gas emissions as the interventions proposed seek to promote a modal shift to more sustainable transport options. Specifically, the rail and bus interventions proposed will also help reduce emissions from Scotland's transport sector through the decarbonisation of the rail and bus networks respectively. These interventions will also contribute to the achievement of Scotland's CO₂ emissions reduction target of net zero by 2045, whilst promoting and supporting the best use of clean fuels and technologies. Some of the interventions related to safety and resilience and strengthening strategic connections are anticipated to result in uncertain effects on greenhouse gas emissions as they are not likely to encourage modal shift. In addition, some of the new fixed links recommendations have the potential to result in an increase in motorised traffic to and from the mainland, potentially increasing emissions. However, the decarbonisation of ferry networks is likely to result in major positive effects on reducing greenhouse gas emissions as this will directly contribute to the achievement of Scotland's CO₂ emissions reduction target. Recommendations relating to the road network are anticipated to result in minor negative effects on greenhouse gas emissions as several of the interventions proposed have the potential to increase capacity for the number of vehicles on the trunk road network, thus increasing associated transport emissions and use of natural resources.

Many recommendations will also help adapt the transport network to the predicted effects of climate change by prioritising transport connections to critical infrastructure, islands and coastal communities that are more vulnerable to the projected impacts of climate change. In particular, there is a recommendation that is focused on trunk road and motorway climate change adaptation and resilience.

8.3.2. Air Quality

Overall, the majority of the recommendations are anticipated to result in minor positive effects on air quality as the interventions proposed seek to promote a modal shift to more sustainable transport options and consequently will help reduce all forms of transport-related air pollution and improve air quality throughout Scotland. This will be achieved by reducing traffic congestion, limiting more polluting vehicles, limiting polluting traffic growth, decarbonising the rail and bus network, decarbonising freight deliveries and improving the modal shift of freight from road to rail. The recommendations relating to strategic connections and increasing safety and resilience are anticipated to result in uncertain effects on air quality as it is not clear whether the proposed interventions would result in a reduction or increase in transport-derived air pollutant emissions or, consequently, any improvements in air quality across Scotland. Furthermore, the fixed link interventions proposed have the potential to result in increases in motorised traffic to and from the mainland, potentially resulting in increases in emissions and reductions in air quality. Recommendations relating to the road network are anticipated to result in minor negative effects on air quality as several of the interventions proposed have the potential to increase capacity for the number of vehicles on the trunk road network, thus increasing associated transport emissions and potentially reducing air quality.

The decarbonisation of ferry networks could result in major positive effects on air quality by reducing emissions of key air pollutants (NO_x, particulates, SO₂) from ferry transport, helping to limit polluting traffic growth, and potentially limiting more polluting vehicles in sensitive areas.

8.3.3. Population and Human Health

A significant majority of recommendations are anticipated to result in minor positive effects on quality of life and human health, as the interventions proposed will improve quality of life and human health and increase sustainable access to essential services, employment and the natural environment. They will achieve this through improved access to more sustainable forms of transport, provision of active travel connections and related interventions between villages and nearby towns and regional centres, and improvements to existing roads for the purpose of active travel (e.g. improved crossing points, surfacing, lighting etc.). The active travel recommendations are also likely to generally improve perceptions of road safety and encourage more people to use active travel choices. The decarbonisation of the bus and rail networks will also potentially encourage sustainable access to the natural and historic environment and ensure safe and sustainable access for all users to essential services and places of employment. The freight-related interventions are anticipated to result in neutral effects on quality of life and human health as the relationship between most interventions and the achievement of the aforementioned aims is unclear. However, it should be noted that several of the freight-related interventions proposed are anticipated to result in minor positive effects on these aims by potentially ensuring safe and sustainable access to essential services and employment, and allowing for greater journey time reliability. Recommendations relating to the road network are generally anticipated to result in uncertain effects on quality of life and human health. While some of the interventions proposed may improve access to essential services,

employment and the natural environment, this access will be achieved via the road network and therefore will not be sustainable, at least in the short term (until a greater proportion of cleaner vehicles use the road network), due to air pollutant emissions.

Many of the recommendations are anticipated to result in uncertain effects on noise and vibration as it is unclear if the proposed interventions will reduce noise and vibration and this will be dependent on the location and nature of the interventions adopted. The active travel and behavioural change recommendations are generally anticipated to result in minor positive effects on noise and vibration as most of the interventions proposed will help encourage a modal shift to more sustainable modes of travel. The technology recommendations are anticipated to result in neutral effects on noise and vibration as the interventions proposed are not expected to have any notable effect on this topic. The strategic connections recommendations are generally anticipated to result in minor negative effects on noise and vibration as most of the interventions proposed will potentially increase noise and vibration on the transport network during both the construction and operation of any improvements to the transport network.

The public transport recommendations are anticipated to result in neutral effects on developing high quality places as the various interventions proposed are unlikely to have a notable effect on this objective. The influencing travel choices recommendations are anticipated to result in uncertain effects on developing high quality places, as, although they are likely to improve safety on the transport network, they will not directly help promote, invest in, build or maintain infrastructure to support the development of high-quality places. The active travel recommendations are anticipated to result in minor positive effects on developing high quality places as the interventions proposed will help to support the development of high-quality places by prioritising pedestrians in the public realm. Some of the interventions will also help support the development of places that feel safe to all users through improvements to active travel routes, including road crossings and lighting, and measures to reduce traffic volumes and/or speeds and campaigns to promote better driver behaviour.

The vast majority of the recommendations are anticipated to result in minor positive effects on safety as these interventions will help improve safety on the transport network by potentially reducing the likelihood of transport-related road accidents and casualties by; encouraging a modal shift to more sustainable modes of travel, including the expansion of 20mph zones and limits; a modal shift of freight from road to rail; proposals for freight rest stops and upgrades to existing mobility hubs and public transport facilities. The bus and mass transit recommendations are anticipated to result in uncertain effects on safety. While several of the proposals (e.g. delivery of faster and more reliable journey times for bus passengers and expansions to the tram network) will support the development of places that feel safe to all users by reducing road traffic, it is unlikely that the other proposals (e.g. the decarbonisation of the bus and rail networks) would significantly contribute to safety.

8.3.4. Material Assets

The majority of the recommendations are anticipated to result in minor positive effects on the sustainable use of the transport network by promoting or improving the sustainable use of the transport network through planning for future travel arrangements where journeys are made by a number of different modes (including active travel modes), e.g. improvements to the ferry network. Some of the interventions proposed also support improvements to transport technology and promote the sustainable use and management

of existing infrastructure, including upgrades to or replacement of vessels, and the decarbonisation of the ferry network. The behaviour change and mass transit recommendations are anticipated to result in uncertain effects on the sustainable use of the transport network as there is not a clear link between several of the interventions proposed (e.g. expansion of 20mph zones and limits across Scotland) and the promotion and improvement of the sustainable use of the transport network. However, one of the mass transit interventions is considered to result in major positive effects on the sustainable usage of the transport network as it involves proposals for bus rapid transit, rail conversion and tram network extension, thereby potentially helping plan for future travel arrangement where journeys are made by a number of different modes, and for the future capacity of public transport, while also taking demographic and other societal changes into account.

The fixed link and safety and resilience recommendations are generally anticipated to result in minor negative effects on the SEA's key environmental requirement/ objective to reduce material consumption. This is because they will require the use of natural resources as several of the interventions proposed may require significant quantities of materials and construction related trips. It should also be noted that there is a potential opportunity for road schemes to improve surface conditions, and, alongside advancement in the types of materials used, reduce overall maintenance needs in the longer term, with associated positive impacts. In addition, the decarbonisation of the ferry network is anticipated to result in uncertain effects on reducing the use of natural resources as this intervention may result in reductions in the use of natural resources and contributions to the circular economy; however, this is dependent on the methods and technologies adopted. The technology-related recommendations are generally anticipated to result in negligible effects on reducing use of natural resources. The remainder of the recommendations are anticipated to result in uncertain effects on reducing use of natural resources. Depending on the source and type of materials/natural resources used to construct some of the new infrastructure associated with several of the proposed recommendations, there is potential for negative impacts on material assets in relation to the use of natural resources during both the construction and operation phases. However, there is not a clear link between other interventions proposed (e.g. the expansion of 20mph zones and limits across Scotland) and the reduction in the use of natural resources.

8.3.5. Water Environment

The vast majority of the recommendations are anticipated to result in uncertain effects on the water environment, as there is potential for negative environmental impacts during construction and operation of the various interventions proposed, although this will be dependent on their location and/or design. It is therefore recommended that further environmental assessment is undertaken as the interventions develop in order to identify potentially significant location-specific environmental impacts and mitigation where appropriate. It should also be noted that there is potential for positive effects on the water environment associated with the bus recommendations. This is due to potential reductions in diffuse pollution on key receptors associated with the decarbonisation of the bus network; however, the significance of effects are uncertain at this stage. Overall, the active travel and technology-related recommendations are anticipated to result in neutral effects on the water environment as minimal hard infrastructure is required for most of the interventions proposed. The fixed link recommendations are generally anticipated to result in a neutral to minor negative effects on the water environment as the related most of the interventions are largely confined to proposed involve expansions to the improvement of

the existing ferry network, and therefore have only limited additional the potential to result in direct impacts on the water environment. However, the decarbonisation of the ferry network may result in minor positive effects on the water environment as this intervention has the potential to protect or improve water quality by replacing older vessels.

8.3.6. Biodiversity

Most of the recommendations are anticipated to result in uncertain effects on biodiversity, as there is potential for negative environmental impacts during construction and operation of the improvements, depending on the location and design of the interventions proposed. The active travel and technology-related recommendations are generally anticipated to result in neutral effects on biodiversity as minimal hard infrastructure is required for most of the interventions proposed. The strategic connections (fixed link) recommendations are generally anticipated to result in at least minor negative effects on biodiversity as the construction of these interventions could result in direct impacts on biodiversity (e.g. through pollution or construction noise disturbance), including potential damage to or loss of designated and undesignated wildlife or geological sites. However, the decarbonisation of the ferry network (e.g. the use of alternative fuel sources or transition to zero carbon emissions) is anticipated to result in minor positive effects on biodiversity as this intervention could potentially protect or enhance the integrity of existing habitat, and/or protect or enhance the integrity of internationally, nationally or locally designated biological or geological sites.

8.3.7. Soil

The vast majority of the recommendations are generally anticipated to result in uncertain effects on soil, as there is potential for negative environmental impacts during both the construction and operation of the various interventions proposed, although this will be dependent on the location and design of these interventions. The active travel and technology-related recommendations are generally anticipated to result in neutral effects on soil as minimal hard infrastructure is required for the majority of the interventions proposed.

8.3.8. Cultural Heritage

Most of the recommendations are anticipated to result in uncertain effects on cultural heritage as there is potential for a range of effects associated with the various interventions proposed. For example, the fixed link interventions have the potential for at least minor negative effects on designated and undesignated archaeological sites and other culturally and historically important features. These interventions could also affect key views to and from heritage assets. Several of the road interventions proposed could also result in negative environmental effects during both the construction and operation phases; however, the scale of the impacts is uncertain at this stage, particularly for junction improvements, realignment, widening and overtaking opportunities. There is no clear relationship between the decarbonisation of the bus, rail and ferry networks and the protection or enhancement of cultural heritage. Any redevelopment of railway stations could also potentially lead to negative impacts on cultural heritage, including cumulative effects across Scotland. Mitigation measures are listed in **Section 9.8** of this report.

8.3.9. Landscape and Visual Amenity

The Technology recommendations are anticipated to result in neutral effects on landscape and visual amenity as the proposed interventions will require minimal hard infrastructure. The remainder of the recommendations are anticipated to result in uncertain effects on landscape and visual amenity as there is potential for a range of effects associated with

the various interventions proposed. However, urban realm improvements, for example, associated with some active travel interventions could lead to (post construction) improvements to the landscape in some locations.

There is also potential for negative environmental effects during both the construction and operation of several of the road interventions proposed. However, the scale of the impacts is uncertain at this stage, particularly for junction improvements, realignment, widening and overtaking opportunities.

There is no clear relationship between the decarbonisation of the rail, bus and ferry networks (at this strategic level) and landscape and visual amenity.

8.4. Compatibility of STPR2 Recommendations with the SEA Objectives

The 45 STPR2 Recommendations, listed in **Section 2.10**, have been checked for compatibility with the SEA objectives listed in **Section 7.3**. The detailed assessment of the recommendations across all SEA Objectives, with an accompanying narrative to explain the scoring, is provided in **Appendix F (Assessment Matrices)**. Table 7 provides a list of the STPR2 recommendations and a cumulative 'average' score for each recommendation across all SEA Objectives. This average score was based on the methodology provided in **Section 7.8**.

Table 7: Compatibility Assessment of STPR2 Recommendations and SEA Objectives

STPR2 RECOMMENDATIONS	RECOMMENDATION NUMBER	SEA CUMULATIVE SCORE
Connected Neighbourhoods	1	+
Active Freeways and Cycle Parking Hubs	2	+
Village-Town Active Travel Connections	3	+
Connecting Towns by Active Travel	4	+
Long-Distance Active Travel Network	5	+
Behaviour Change Initiatives	6	+
Changing Road User Behaviour	7	0
Increasing Active Travel to School	8	+
Improving Access to Bikes	9	+
Expansion of 20mph limits and zones	10	+
Clyde Metro	11	?
Edinburgh & South East Scotland Mass Transit	12	?
Aberdeen Rapid Transit	13	?
Provision of Strategic Bus Priority Measures	14	?

STPR2 RECOMMENDATIONS	RECOMMENDATION NUMBER	SEA CUMULATIVE SCORE
Highland Mainline Rail corridor enhancements	15	?
Perth-Dundee-Aberdeen Rail Corridor Enhancements	16	?
Edinburgh/Glasgow-Perth Rail Corridor Enhancements	17	?
Supporting integrated journeys at ferry terminals	18	+
Infrastructure to provide access for all at rail stations	19	+
Investment in DRT and MaaS	20	+
Improved Public Transport Passenger Interchange Facilities	21	?
Framework for delivery of Mobility Hubs	22	?
National Integrated Public Transport Ticketing	23	0
Ferry Vessel Renewal and Replacement and Progressive Decarbonisation	24	+
Rail Decarbonisation	25	?
Decarbonisation of the Bus Network	26	+
Behaviour change and modal shift for freight	27	+
Zero Emission Vehicles and Infrastructure Transition	28	+

STPR2 RECOMMENDATIONS	RECOMMENDATION NUMBER	SEA CUMULATIVE SCORE
Access to Argyll	29	Not applicable (subject to separate SEA)
Trunk Road and Motorway Network Safety Improvements	30	?
Trunk Road and Motorway Network Climate Change Adaptation and Resilience	31	?
Trunk Road and Motorway Network Renewal for Reliability, Resilience and Safety	32	?
Control Centre of the Future	33	0
Incident Management System (IMS) Upgrade	34	0
Intelligent Transport Systems	35	0
Strategy for improving rest and welfare facilities for hauliers	36	0
Improving active travel on trunk roads through communities	37	+
Speed Management Plan	38	0
Sustainable Access to Grangemouth Investment Zone	39	+
Access to Stranraer and the ports at Cairnryan	40	?
Potential Sound of Harris / Sound of Barra Fixed Link and Fixed Link between Mull and Scottish mainland	41	-
Investment in port infrastructure to support vessel renewal and replacement and progressive decarbonisation	42	?

STPR2 RECOMMENDATIONS	RECOMMENDATION NUMBER	SEA CUMULATIVE SCORE
Major Stations Masterplans	43	?
Rail Freight Terminals and Facilities	44	?
High Speed Cross Border Rail Enhancements	45	-

The compatibility check found that the majority of recommendations are compatible with the SEA Objectives and their underlying guide questions. Overall, there are more positive cumulative scores than any other scores. Many of the recommendations also received neutral scores, where the recommendations did not directly relate to the SEA objectives. The uncertain scores are largely due to the uncertainty associated with where and how a recommendation might eventually be implemented 'on the ground.' Further environmental assessment will be undertaken to allow these impacts to be better understood, as described in **Section 9.9**.

8.5. In-Combination Assessment

Table 8 lists the PPS that were considered to have in-combination cumulative effects with STPR2 and provides a summary description of these effects. The table does not provide a comprehensive list of PPS but focuses on the national-level PPS that were considered most likely to have in-combination effects at the strategic level. A wider list of PPS is provided in **Appendix B (Plans, Programmes and Strategies)** and summary descriptions of key PPS are also provided in **Chapter 3 (Policy Context)**.

Table 8: STPR2 In-combination Effects with Other PPS

PPS	COMBINED EFFECTS WITH STPR2
<p>Securing a green recovery on a path to net zero: climate change plan 2018–2032 – 2021 update</p> <p>Climate Change (Emissions Reduction Targets) (Scotland) Act 2019</p> <p>Securing a Green Recovery on a Path to Net Zero</p> <p>Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024</p> <p>Carbon Account for Transport No. 12: 2020 Edition</p> <p>A Low Carbon Economic Strategy for Scotland</p> <p>Low Carbon Scotland – Meeting Our Emissions Reduction Targets 2013-2017: Second Report</p> <p>Climate Change Adaptation Plan 2020</p> <p>Decarbonising the Scottish Transport Sector</p> <p>Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024</p> <p>Clean Air Strategy 2018 (DEFRA)</p> <p>Cleaner Air for Scotland 2</p> <p>Cleaner Air for Scotland – The Road to a Healthier Future (2015)</p> <p>Air Quality Strategy for England, Scotland, Wales and Northern Ireland</p> <p>Scotland’s National Marine Plan (2015)</p> <p>Future Intelligent Transport Systems Strategy</p>	<p>Many of the STPR2 recommendations align with PPS related to climate change, low carbon, clean air and decarbonising the transport sector. The recommendations align with the commitments to reduce greenhouse gases and air pollutants, identifying and reducing sources of air pollution, protect nature and boost the economy. For example, transport related greenhouse gas emissions are expected to fall as a result of STPR2 active travel and decarbonisation-focused interventions being implemented. These effects will be enhanced by the PPS listed. Combined positive effects are predicted for Population and Human Health, Climatic Factors, Air Quality and Water Environment.</p>

PPS	COMBINED EFFECTS WITH STPR2
<p>NPF4 National Developments</p>	<p>Many recommendations align and support NPF4 National Developments through enhancement to provide multifunctional green infrastructure that provides greatest environmental, lifelong physical and mental health, social wellbeing and economic benefits. In particular, the ‘Liveable Places’ National Developments will help to achieve these benefits.</p> <p>NPF4 focuses on those areas where greening and development can be mutually supportive, helping to improve equity of access to quality green space, and supporting communities where improving wellbeing and resilience is most needed, including to help people adapt to future climate risks. Combined positive effects are predicted for Population and Human Health, Climatic Factors, Air Quality and Material Assets.</p>
<p>Going Further: Scotland’s Accessible Travel Framework</p>	<p>Some STPR2 recommendations support Scotland’s Accessible Travel Framework which provides a national vision and outcomes for accessible travel, new ways of working to include disabled people and a high-level action plan to tackle issues. Both plans seek to improve the mobility of passengers and access for all to essential services with a focus on improved safety and reducing barriers for passengers with reduce mobility and creating an attractive public realm. Combined positive effects are expected for Climatic Factors, Air Quality and Population and Human Health</p>
<p>NPF4 National Development: High Speed Rail Consultation on Scotland’s Rail Infrastructure Strategy 2019 Rail Enhancement & Capital Investment Strategy 2018 Scotland’s Railways</p>	<p>The STPR2 recommendations related to the development of the rail services align with the national developments which support the implementation of increased infrastructure to improve rail capacity and connectivity on the main cross-border routes and the east and west coast mainlines. Combined positive effects are predicted for Population and Human Health, Climatic Factors and Air Quality.</p>

PPS	COMBINED EFFECTS WITH STPR2
<p>Let's Get Scotland Walking: The National Walking Strategy (2014)</p> <p>A More Active Scotland: Scotland's Physical Activity Delivery Plan</p> <p>A Connected Scotland: our strategy for tackling social isolation and loneliness and building stronger social connections</p> <p>A Long-Term Vision for Active Travel in Scotland 2030</p> <p>Cycling Action Plan for Scotland 2017-2020</p> <p>NPF4 National Development: National Walking, Cycling and Wheeling Network</p>	<p>Many of the STPR2 recommendations align with supporting modal shift from private vehicles to walking, cycling and wheeling for everyday journeys. This will help reduce greenhouse gas emissions from transport and will also be highly beneficial for health and wellbeing. Positive combined effects are predicted for Population and Human Health, Climatic Factors and Air Quality.</p>
<p>The National Islands Plan</p> <p>Scotland's National Marine Plan (2015)</p> <p>Scottish Ferry Services: Ferries Plan (2013-2022)</p>	<p>The STPR2 Island Connectivity recommendations support other plans that aim to meaningfully improve outcomes for island communities. The recommendations seek to improve accessibility, reduce severance and increase transport choice as well as support plans for future capacity of public transport, taking demographic and other societal changes into account. Positive combined effects are predicted for Population and Human Health and Material Assets.</p>
<p>Realising Scotland's full potential in a digital world: a digital strategy for Scotland (2017)</p> <p>Smart and Integrated Ticketing and Payments – Delivering Strategy 2018</p>	<p>The STPR2 'Technology' recommendations support a vision for Scotland as a vibrant, inclusive, open and outward-looking digital nation with smart and integrated ticketing and payment across Scotland. The recommendations and PPS listed are likely to encourage more people to use public transport and enable greater accessibility to essential services, employment and the natural environment.</p> <p>There are likely to be combined positive effects on Population & Human Health, Climatic Factors and Air Quality.</p>

PPS	COMBINED EFFECTS WITH STPR2
<p>Scotland’s Road Safety Framework to 2030 Scottish Trunk Road Network Asset Management Strategy</p>	<p>Many STPR2 recommendations align with the plans that are committed to ensuring that Scotland’s transport network is able to serve its function in addition to being safe, resilient and in the best condition. The focus of the recommendations is on road safety but there are also possible contributions relating to network resilience and adaptation. Combined positive effects are predicted for Population and Human Health.</p>

9. Strategic Mitigation and Enhancement

9.1. Overview

The environmental assessment aims to prevent, reduce or offset any significant adverse effects as far as possible before mitigation measures are proposed. In addition to preventing or minimising adverse effects, mitigation measures have also been provided for SEA topics where many uncertain effects were predicted in the assessment.

Undertaking the SEA process alongside the STPR2 development process helps ensure that modifications can be made at the strategic level, i.e. via alternatives and identifying issues which can be addressed through other relevant PPS policies/strategies.

Where location-specific mitigation requirements are identified, these are described with appropriate recommendations for implementation at a project level.

In addition to mitigation measures, recommendations for STPR2 enhancement opportunities have been provided wherever possible.

The mitigation measures and enhancement opportunities consider:

- the environmental baseline data provided in Appendix C (National Baseline) and D (Regional Environmental Summaries);
- the environmental requirements emerging from the PPS review, provided in Table 1
- the SEA Objectives and Assessment Guide questions provided in Table 3;
- feedback received from the regional and national workshops, described in **Section 6.2** respectively, including local context and feasibility;
- key issues and opportunities identified during the continuing development of the STPR2, the EqIA and other supporting assessments; and
- feedback from the SEA Consultation Authorities.

9.2. Climatic Factors and Material Assets

9.2.1. Strategic Opportunities to Reduce Greenhouse Gas Emissions

The regional workshops for STPR2 held from May to June 2019 identified a number of strategic opportunities to reduce greenhouse gas emissions. These opportunities, and the STPR2 response to them are shown in Table 9.

Table 9: Strategic Opportunities in Relation to Climate Change

STRATEGIC OPPORTUNITY	STPR2 RESPONSE
Technology – Electric vehicles and Mobility as a Service (MaaS), electric or low emission trains, more charging points, electric car sharing, digitisation	<p>MaaS is included as a grouping in the STPR2 final recommendations (Recommendation 20: Investment in Demand Responsive Transport and MaaS Pilot Schemes).</p> <p>Decarbonisation of the rail and bus networks are both part of the final STPR2 recommendations (Recommendations 25 and 26).</p> <p>Recommendation 28 is focused on providing a national framework for zero emission vehicles, to enable investment in fleets, facilities and emerging technologies.</p>
Low Emission Zones in Glasgow, Edinburgh, Dundee & Aberdeen (require careful management)	LEZs are being implemented in Glasgow, Edinburgh, Dundee & Aberdeen in 2022.
Alternative fuels	The objective of Recommendation 28 is to bring together key industries and sectors and work strategically with the private sector to facilitate the planning, management and delivery of the required alternative refuelling network and expansion/improvements to the charging network.
More fuel-efficient ferries	Recommendation 42 (Investment in port infrastructure to support vessel renewal and replacement and progressive decarbonisation) is focused on an investment programme in port infrastructure including power, to support vessel renewal and replacement and progressive decarbonisation of the Clyde and Hebrides Ferry Services (CHFS) and Northern Isles Ferry Services (NIFS) ferry networks by 2045.
All new taxi licences to be electric / hybrid	Not included in final STPR2 recommendations.
Demand-responsive transport	Demand Responsive Transport is included in the STPR2 final recommendations (Recommendation 20: Investment in Demand Responsive Transport and MaaS Pilot Schemes).

STRATEGIC OPPORTUNITY	STPR2 RESPONSE
<p>Opportunity to make climate change targets ‘real’ at a local level – calculate mode shift required in each area and corridor.</p>	<p>Carbon calculations for different transport modes will be included in the final (post-consultation) version of this Environmental Report and will also be taken into account in the monitoring framework to be included in the SEA Post Adoption Statement.</p>
<p>More investment in public transport & active travel, incentivise employers to promote behaviour changes</p>	<p>The STPR2 Final Report (Jacobs Aecom, 2022b) includes various recommendations that will promote increased use of public transport and active travel. These include interventions focused on:</p> <ul style="list-style-type: none"> • Improving active travel infrastructure • Enhancing access to affordable public transport • Increasing safety and reliability on the strategic transport network • Enhancing strategic connections
<p>Spatial planning - Need higher density and well-located developments to reduce the need to travel by car</p>	<p>STPR2 and NPF4 have been developed over a similar timeline and close collaboration between the two teams, both for the respective plans and their associated impact assessments. A key concept that is included in both NPF4 and STPR2 is 20-minute neighbourhoods. This is included in STPR2 as part of Recommendation 1 (Connected Neighbourhoods). Connected Neighbourhoods would provide high quality streetscapes in town and/or suburban district centres, along with high quality active travel routes to connect nearby (typically within around 800m) residential areas to those centres.</p>

9.2.2. Early Planning to Avoid or Reduce Greenhouse Gas Emissions

Planning to avoid or reduce greenhouse gas emissions at this strategic planning stage is essential for improving the carbon outcomes of the STPR2 transport recommendations. Figure 7 shows the general opportunities to avoid or reduce carbon through project planning.

Carbon reduction curve

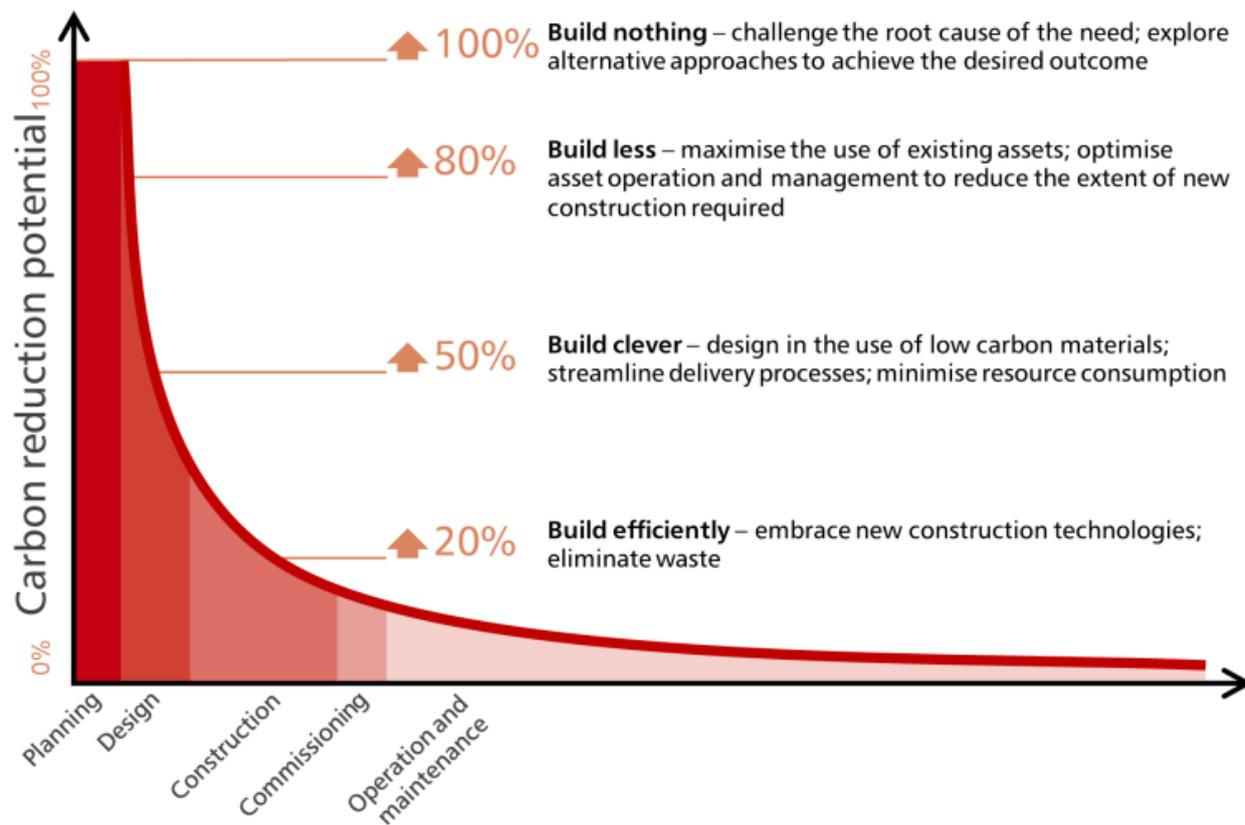


Figure 7: Carbon Reduction Curve (The Fifth Estate, 2020)

The opportunities associated with early planning for carbon reduction include the following:

- Challenge the root cause of the need for a new transport asset – explore alternative (no build) solutions to deliver objectives;
- Hold carbon opportunities workshops from the earliest planning stage onwards;
- Identify strategic carbon reduction opportunities across Scotland and in each of the 11 STPR2 regions;
- Close collaboration with NPF4 team and local authority planners to ensure travel demand and trip lengths are reduced;
- Consider the potential for wider use of behavioural change and other policy solutions and funding instead of providing new infrastructure, e.g. the commitment to reduce car kilometres by 20% by 2030;
- Re-use and refurbish transport assets, extending their life rather than replacing them;
- Support modal shift to active travel and public transport;
- Future-proof transport infrastructure to allow the introduction or wider roll-out of emerging zero or low-carbon technologies;
- Plan for the wider usage of zero-emission vehicles in line with the Element Energy (2021) recommendations;
- Select 'soft' rather than 'hard' engineering solutions where possible, e.g. nature-based solutions;
- Identify the key emission sources associated with each intervention, and how they can be reduced;
- Avoid disturbance of vegetation and soils, particularly those with high carbon value e.g. peat and carbon-rich soils, wetlands and ancient woodland;

- Opportunities for offsetting should be considered where appropriate to contribute towards the national legislative target of achieving net zero emissions by 2045.

Recognising and implementing the strategic opportunities listed above and in Table 9 will enable STPR2 to meet Scotland’s greenhouse gas reduction targets (as described in **Section 3.3**) and also address recommendations from Element Energy (2021) and Scotland’s Climate Assembly (Scottish Government, 2021i).

9.2.3. Choice of Materials for Transport Interventions

Although the choice of construction materials is not necessarily a consideration at the strategic planning stage, the decision to construct is often taken at the strategic planning stage. Early planning could potentially avoid the need to use materials with a high embedded carbon content at the construction stage. Each material that could potentially be used in the construction of a new transport asset or in the maintenance of an existing asset has an embodied carbon content associated with it. Figure 8 shows the sources of carbon emissions during the lifecycle of construction materials.

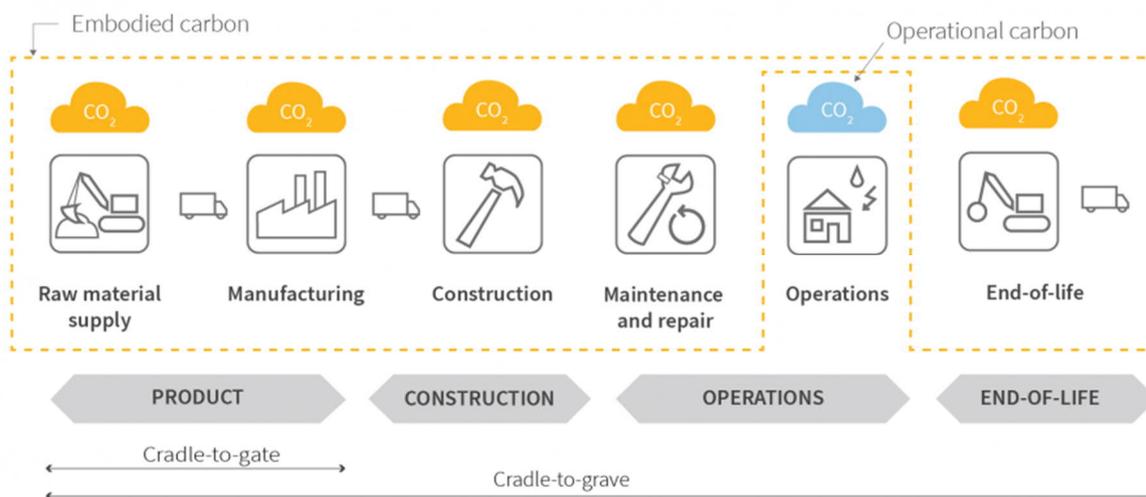


Figure 8: Sources of Carbon for Construction Materials (Carbon Leadership Forum, 2020)

The relative impact of each stage shown in Figure 8 above will depend upon the material choice. Recycled material will often have a lower carbon footprint as less energy and transport may be required. Heavier products may have more impact in transport and more highly processed materials may have most emissions within the manufacturing process (The Fifth Estate, 2020).

To minimise emissions from potential future interventions, designers should take cognisance of the latest best-practice, which is evolving due to advancements in material science, manufacturing and construction processes. This best practice should include identifying low-carbon materials and durable materials that require less maintenance, repair or replacement, in order for the operational emissions of transport assets to be minimised.

From a qualitative perspective, emissions from proposed multi modal interventions would be dependent on location, scale, primary materials and construction methods. For instance, interventions requiring significant volumes of concrete and steel such as bridges, junctions, viaducts and tunnels would have a high embodied carbon content due to the carbon intensity of the manufacture of the materials used in their construction.

Carbon life cycle assessment should be employed to reflect embodied carbon from demolition, materials, transport and maintenance, as well as the operational carbon associated with heat and power. Carbon life cycle models should calculate the whole life carbon for 2030 and 2045 carbon reduction target dates, as well as the industry standard of 60 years (HES, 2021b).

The STPR2 Delivery Plan should include provisions for sustainable procurement that accounts for the carbon footprint of materials and products (i.e. country of origin and transport requirements). Consideration should be given to assessing the carbon benefit of prolonged lifespan arising from adequate maintenance (HES, 2021). Sustainable procurement provisions should include circular economy principles that prioritise the reuse of materials in construction, use low-carbon construction materials and design principles that allow for materials to be re-used or recycled upon decommissioning. Consideration should also be given to the location of suppliers, to minimise transportation distances, subject to any procurement limitations.

9.2.4. Construction Methods

In addition to embedded carbon considerations, construction activities also need to be considered and planned for. Interventions requiring significant earthwork movements will have a high energy demand from earth moving equipment and tipper trucks moving earth around/off/to the site. The source of power supply is a significant factor when assessing emissions from construction – whether the machine is power by diesel generators or can be plugged into the electricity grid.

Operational maintenance and refurbishment emissions also need to be considered for an asset throughout its operational life. For example, a road will require periodic resurfacing or a bridge could require replacement of cables. These emissions tend to be assessed based on assumptions made on the design life of materials to determine how many times they will be replaced during the lifespan. The final consideration for materials is end of life emissions, which captures dismantling and disposal. PAS 2080 (Construction Leadership Council, 2019) provides useful guidance on how to manage carbon emissions throughout the life of an infrastructure project.

9.3. Population and Human Health

Many of the final STPR2 recommendations will have beneficial impacts on Population and Human Health, as shown in the assessment summary of **Chapter 8 (Assessment Results)**. However, there remain some strategic opportunities to enhance these beneficial impacts. In particular, the SEA would recommend that:

- All of the active travel recommendations are taken forward and implemented in order to maximise the potential modal shift from private vehicles to walking, wheeling and cycling.
- Transport Scotland's active travel investment is prioritised towards locations and areas in which it can help local authorities and their partners deliver comprehensive, high-quality active travel networks, with appropriate supporting measures. This prioritisation should be given to investments which will result in high-quality, attractive, dense and safe networks for people to walk, wheel and cycle within their communities, and to neighbouring communities.
- The development of STPR2 interventions should prioritise the provision of high-quality green or blue infrastructure, or improve accessibility to existing green and blue infrastructure. This is likely to lead to significant benefits for mental and physical health as well as sense of place and local pride.

9.4. Water

STPR2 interventions that focus on climate change adaptation, such as Recommendation 31, will provide opportunities to reduce flood risk and increase the installation of Sustainable Drainage Systems, which will help maintain or improve water quality. The implementation of nature-based solutions, as described in **Section 9.5**, will also help maintain or improve water quality through the protection of soil and reduction of erosion.

The design of any STPR2 interventions should be undertaken in line with best practice and relevant guidance, considering the requirements of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) and in consultation with SEPA. Site specific flood risk assessments should be undertaken in accordance with DMRB, SEPA and other relevant guidance, as more localised detail becomes available at each relevant design stage.

9.5. Biodiversity

The following mitigation measures will be required for STPR2 in relation to biodiversity:

- Further environmental assessment will need to be undertaken to ensure site-level biodiversity constraints and opportunities are identified and thereby allow any negative impacts on biodiversity to be avoided or minimised. This includes consideration of designated and undesignated biodiversity. This environmental assessment will need to prioritise achieving positive effects for biodiversity and delivering nature-based solutions with multiple benefits.
- Where new transport infrastructure is proposed, particularly linear infrastructure, opportunities to provide green infrastructure alongside it should also be explored – for example to provide new wildlife corridors between biodiversity sites.
- Where new transport infrastructure is proposed, this should seek to reduce overall land-take and avoid sites designated for their biological interest, particularly sites of international and national importance.
- Further engagement with NatureScot will be required in relation to the development of any new infrastructure or improvements to existing infrastructure.

9.6. Soil

The following mitigation measures will be required for STPR2 in relation to soil:

- Further environmental assessment will need to be undertaken to ensure site-level development avoids any impacts on carbon-rich soils, areas important for carbon sequestration and sites designated for their geological interest i.e. Geological Conservation Review (GCR) sites; and
- Where new transport infrastructure is required, prioritise the development of vacant and derelict land to avoid or minimise loss of undisturbed soils.

9.7. Cultural Heritage

The role that the historic environment plays in existing transport infrastructure needs to be recognised in the planning of any future upgrades of this infrastructure - this issue was highlighted by HES in their response to the STPR2 SEA Progress Report in March 2021. For example, some rail stations have Listed Building status (e.g. Edinburgh Waverley) or contain important historic assets, such as cast iron footbridges. Transport infrastructure can therefore play a key role in local pride and sense of history and place, and future

development needs to take these factors into account. This is most likely to apply to the following STPR2 recommendations:

- 11 (Clyde Metro)
- 12 (Edinburgh & South East Scotland Mass Transit)
- 16 (Perth – Dundee – Aberdeen Rail Corridor Enhancements)
- 17 (Edinburgh/Glasgow-Perth Rail Corridor Enhancements)
- 19 (Infrastructure to provide access for all at rail stations)
- 21 (Improved Public Transport Passenger Interchange Facilities)
- 22 (Framework for delivery of Mobility Hubs)
- 25 (Rail Decarbonisation)
- 42 (Investment in Port Infrastructure)
- 43 (Major Station Masterplans)
- 44 (Rail Freight Terminals and Facilities).

The following mitigation measures will be required for STPR2 in relation to cultural heritage:

- Further environmental assessment will need to be undertaken to ensure site-level heritage constraints and opportunities are identified. This includes consideration of designated and undesignated heritage assets. For rail infrastructure, the environmental assessment will also need to consider the potential impacts associated with access work, electrification and issues for historic bridges etc relating to gauge clearance work
- At the project level, the location and design of transport interventions should avoid direct impacts on cultural heritage resources or their setting, where feasible.
- At the project level, opportunities should be sought to maintain, restore and repurpose historic assets to support sustainable placemaking (in line with NPF4).
- Further engagement with HES will be required in relation to the development of any new infrastructure or improvements to existing infrastructure.

9.8. Landscape and Visual Amenity

The following mitigation measures will be required for STPR2 in relation to Landscape and Visual Amenity:

- Embed landscape mitigation into design of STPR2 interventions, including careful route selection and alignments, input into the design of structures and form and extent of earthworks, woodland planting, limiting the extent of the cutting slopes with cognisance of landscape setting, and avoiding or reducing the loss of existing natural landscapes.
- Minimise the loss of existing vegetation wherever practicable and in particular retain mature trees and woodland and ancient woodland. Where loss of existing vegetation is unavoidable, seek to provide replacement planting which corresponds to, or exceeds, the natural capital value of the landscape elements and ecosystem services lost as a result of the intervention.
- Ensure the design of SuDS features considers opportunities for multi-functionality and delivers amenity and biodiversity benefits as well as attenuation and treatment. Mitigate adverse landscape and visual effects by integrating with surrounding topography, using natural characteristics in design and planting with native aquatic and terrestrial species suitable to local context to provide wildlife habitat and visual interest.
- Take account of local species composition, forest and woodland strategies, climate change adaptation and biosecurity threats when developing planting proposals.

- Develop planting and landscape proposals that integrate with surrounding landscape and secure positive effects for biodiversity. Maintain and where feasible enhance ecological and landscape connectivity and minimise fragmentation. Consider and contribute towards local and strategic biodiversity priorities through planting proposals. Ensure long term management.
- Preserve key vistas/focal points from key viewpoints and maintain or enhance the evolving narrative of the existing scenic routes (walking, cycling, hiking or driving).
- Consider dark skies in Scotland and the perceived wildness of the local landscape and seek to avoid significant effects on them.
- Consult with NatureScot, National Park Authorities and local planning authorities about potential landscape constraints and opportunities associated with specific interventions.

9.9. Further Environmental Assessment

As discussed in the sections above, further environmental assessment will be required at the project level. At the STPR2 strategic level, where locations of interventions are sometimes unknown or where design detail is not yet available, many uncertain effects were assessed in this SEA. This applied to most of the SEA topics. Further environmental assessment will therefore enable the clear identification of constraints, opportunities and ecosystem services at the site/ project level, which in turn will allow the development of targeted and detailed mitigation, enhancement and monitoring measures.

10. Monitoring

Section 19 of the 2005 Environmental Assessment (Scotland) Act requires the Responsible Authority, Transport Scotland, to monitor significant environmental impacts arising as a result of the implementation of the plan, programme or strategy. The purpose of the monitoring is to identify any unforeseen adverse effects at this early planning stage and to enable appropriate remedial action to be taken.

There are a wide range of existing monitoring programmes in place at the national and local level to monitor environmental status and assess performance against established environmental indicators, many of which are relevant to STPR2. Table 10 shows the existing monitoring programmes in Scotland in relation to each SEA topic.

Table 10: Existing Monitoring Programmes

SEA TOPIC	EXISTING MONITORING PROGRAMMES
Climatic Factors: Greenhouse Gas Emissions	Scottish greenhouse gas emissions data are collected as part of the Scottish Government statistics series and includes information on international aviation and shipping. The Annual Compendium of Scottish Energy Statistics (2019b) reports on energy consumption from transport. The collation and collection of data on greenhouse gas emissions is also considered in various plans, including the Climate Change Plan and Carbon Account for Transport.
Climatic Factors: Climate Adaptation	Scotland's Second Climate Change Adaptation Programme.
Air Quality	Monitoring and reporting of air quality currently takes place at 98 monitoring sites throughout Scotland and in some instances, includes real time monitoring data. Air pollution levels across Scotland are updated hourly (Scotland's Environment, 2021). Key performance indicators aligned to Cleaner Air for Scotland: The Road to a Healthier Future are also monitored (Scottish Government, 2015). Environmental Standards Scotland (2021) are currently investigating Scotland's compliance with statutory air quality limit levels for nitrogen dioxide.
Population and Human Health	Key sources of transport-related noise are reported via local authority environmental noise mapping. Road safety is monitored by Transport Scotland (2021b). Transport Scotland also publishes annual statistics on participation in active travel (2020b). National and regional data on income, employment, education, health, access to services, crime and housing is reported via the Scottish Index of Multiple Deprivation (SIMD) tool every four years.

SEA TOPIC	EXISTING MONITORING PROGRAMMES
Material Assets: Sustainable Use of the Transport Network	Monitoring of transport trend data in Scotland is undertaken by Transport Scotland (2021c).
Material Assets: Natural Resources	Proportions of recycled or secondary aggregates used in the construction of transport infrastructure is monitored by Transport Scotland.
Water Environment	<p>The water environment is monitored through a combination of surveillance, operational and investigative monitoring as set out in SEPA’s WFD Aquatic Monitoring Strategy (2007). SEPA’s monitoring responsibilities also include nitrates and protected areas, the results of which are maintained in a register of protected areas (SEPA, n.d.).</p> <p>To monitor surface water flooding and coastal erosion, Flood Risk Management Strategies are available for each of the 14 Local Plan Districts in Scotland. Local Flood Risk Management Plans have also been developed in parallel with the Flood Risk Management Strategies, and projects such as Dynamic Coast have been developed to assess coastal change and identify assets at risk.</p>
Biodiversity	<p>Biodiversity reporting is undertaken both nationally and locally via a number of mechanisms, including via the State of Nature Scotland (NatureScot, 2019) reports and the requirement for public bodies to report every three years to demonstrate compliance with the biodiversity duty, including reporting on progress towards Scotland’s Biodiversity Strategy.</p> <p>Biodiversity reporting is also undertaken via channels such as NatureScot’s Site Conditioning Monitoring Programme and Site Check Monitoring Method (2018) which are supplemented by the Joint Nature Conservation Committee (JNCC) Seabird Monitoring Programme (2021) and the British Trust for Ornithology (BTO) Wetland Bird Survey (n.d.).</p>

SEA TOPIC	EXISTING MONITORING PROGRAMMES
Soil	<p>The Soil Monitoring Action Plan (Soil MAP) collects and displays data on Scotland’s soils, including soil erosion, peatland, soil carbon and soil sealing. The Soil MAP Implementation Plan has been developed in conjunction with the Soil MAP and identifies additional monitoring needs for Scotland’s soils (Scotland’s Soils, 2018).</p> <p>Scotland’s Environment Web (2021) also publishes information on ecosystem health indicators, including indicators for soil carbon and soil sealing.</p> <p>A number of organisations also collect and publish data and information on soil in Scotland, including The James Hutton Institute, Scotland’s Rural College, British Geological Survey, Forestry and Land Scotland, and Scottish Forestry.</p>
Cultural Heritage	<p>HES monitors Scotland’s heritage assets through regular condition assessments and measures such as the HES System for Integrated Geoscience Mapping (SIGMA) and Properties in Care Asset Management System (PiCAMS), as set out in the Asset Management Plan (HES, 2018).</p>
Landscape and Visual Amenity	<p>Scotland’s Landscape Monitoring Programme is a joint venture between NatureScot and HES which aims to monitor landscape change throughout Scotland. The programme monitors four key landscape indicators: landscape qualities, public perception, land cover, and built development (NatureScot, 2017).</p>

The final high-level monitoring framework for STPR2 will be included in the SEA Post Adoption Statement. This will refer to existing monitoring regimes such as those included in Table 10 above. It will also link with the STPR2 Delivery Plan to ensure the timing of the environmental monitoring coincides with the programme for delivery of specific STPR2 interventions.

11. Next Steps

This Draft Environmental Report and the STPR2 Draft Technical Report (Jacobs Aecom 2022b) will be consulted on for a 12 week period starting in January 2022. Following this, all feedback received will be collated and reviewed and used to inform the STPR2 Delivery Plan. In addition, the feedback received will be used to inform and finalise the final version of this Environmental Report and the SEA Post Adoption Statement.

Comments can be provided via the following methods:

- Email: Consultation@stpr2surveys.co.uk
- Address: STPR2 Consultation, AECOM, 120 Bothwell Street, Glasgow, G2 7JS
- Telephone: 0330 122 1369

The specific dates are yet to be confirmed for the remaining SEA stages. However, the indicative timeframes for the key SEA milestones are as follows:

- Publication of Final version of Environmental Report – Spring 2022; and
- Adoption – Winter 2022.

12. References

British Trust for Ornithology (BTO) (n.d.) Wetland Bird Survey. Available at: <https://www.bto.org/our-science/projects/wetland-bird-survey>, accessed 16 December 2021.

Climate Change Committee, Net Zero: The UK's contribution to stopping global warming, 2019, <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>, accessed 12 October 2021.

Carbon Leadership Forum (2020). Looking Ahead to Embodied Carbon Policy Action in 2021. Available at: <https://carbonleadershipforum.org/looking-ahead-to-embodied-carbon-policy-action-in-2021/> accessed 07 January 2022.

Construction Leadership Council and the Green Construction Board (2019). Guidance Document for PAS 2080. Available at: https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2019/06/Guidance-Documents-for-PAS2080_vFinal.pdf, accessed 12 October 2021.

Directive 2001/42/EC (2001) Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the Assessment of the Effects of Certain Plans and Programmes on the Environment. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:197:0030:0037:EN:PDF>, accessed 18 October 2019.

Element Energy (2021) Decarbonising the Scottish Transport Sector. Final Report for Transport Scotland, accessed 16 September 2021.

Environmental Standards Scotland (2021) Air Quality Investigation. Available at: <https://environmentalstandards.scot/wp-content/uploads/2021/11/ESS-Investigations-Air-quality-website-information-Nov21.pdf> , accessed 07 January 2022.

The Fifth Estate (2020) How to Disembody your Carbon. Available at: <https://thefifthestate.com.au/innovation/building-construction/how-to-disembody-your-carbon/> , accessed 04 November 2021.

HES (2018) Asset Management Plan 2018. Available at: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=bb46bde1-518e-4590-8fca-a882010e711f>, accessed 16 December 2021.

HES (2020) Strategic Transport Projects Review 2 - Environmental Assessment (Scotland) Act 2005 – 01511 Scoping. HES response sent to Transport Scotland and SEA Gateway, 6 February 2020.

HES (2021a) Strategic Transport Projects Review 2 - Update and Phase 1 Recommendations - February 2021. HES response sent to Transport Scotland and SEA Gateway, 30 March 2021.

HES (2021b) Infrastructure Investment Plan Consultation. HES response sent to Infrastructure Investment Plan team (Scottish Government) and SEA Gateway, 19 November 2020.

Infrastructure Commission for Scotland (2020) Phase 2 Delivery Findings Report (Appendix A: Summary of Phase 1 Recommendations. Available at: https://infrastructurecommission.scot/storage/261/Phase2_Appendix_A.pdf, accessed 21 June 2021.

Jacobs Aecom (2021a) SEA Progress Report. February 2021. Available at: <https://www.transport.gov.scot/media/49074/strategic-environmental-assessment-sea-progress-report.pdf>, accessed 21 June 2021.

Jacobs Aecom (2022a) Equalities Impact Assessment (EqIA) Report.

Jacobs Aecom (2022b) STPR2: Draft Technical Report.

Joint Nature Conservation Committee (JNCC) (2021) Seabird Monitoring Programme. Available from: <https://jncc.gov.uk/our-work/seabird-monitoring-programme/>, accessed 16 December 2021.

NatureScot (2017) Scotland's Landscape Monitoring Programme. Available at: <https://www.nature.scot/professional-advice/landscape/scotlands-landscape-monitoring-programme>, accessed 16 December 2021.

NatureScot (2018) How we monitor features. Available from: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/site-condition-monitoring/how-we-monitor-features>, accessed 16 December 2021.

NatureScot (2019) State of Nature Report Scotland 2019. Available from: <https://www.nature.scot/sites/default/files/2019-10/State-of-nature-Report-2019-Scotland-full-report.pdf>, accessed 16 December 2021.

NatureScot (2021) STPR2 – Update and Phase 1 Recommendations – SEA Progress Report. NatureScot response sent to Transport Scotland and SEA Gateway, 31 March 2021.

ODPM (2005) A Practical Guide to the SEA Directive. Office of the Deputy Prime Minister. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf accessed 15 October 2021.

Scotland's Environment (2021) Available from: <http://www.scottishairquality.scot/> accessed 24 November 2021.

Scotland's Soils (2018) Soil monitoring. Available from: <https://soils.environment.gov.scot/soils-in-scotland/soil-monitoring/>, accessed 16 December 2021.

Scottish Environment Protection Agency (SEPA) (n.d.) Protected areas – Water. Available from: <https://www.sepa.org.uk/environment/water/monitoring/protected-areas/>, accessed 16 December 2021.

SEPA (2007) Scotland's WFD aquatic monitoring strategy. Available from: https://www.sepa.org.uk/media/38220/wfd_aquatic_monitoring_strategy-scotland_river_basin.pdf, accessed 16 December 2021.

Scottish Government (2013) Strategic Environmental Assessment Guidance. August, 2013.

Scottish Government (2015) Cleaner Air for Scotland: The Road to a Healthier Future Available from: <http://www.gov.scot/Resource/0048/00488493.pdf> accessed 24 November 2021.

Scottish Government (2018) Climate Change Plan: Third Report on Proposals and Policies 2018-2032 Summary Document.

Scottish Government (2019a) National Islands Plan. Available from: <https://www.gov.scot/publications/national-plan-scotlands-islands/pages/7/>, accessed 10 December 2021.

Scottish Government (2019b) Annual Compendium of Scottish Energy Statistics. Available from: <https://www.gov.scot/publications/annual-compendium-of-scottish-energy-statistics/>, accessed 16 December 2021.

Scottish Government (2020a) Protecting Scotland, Renewing Scotland: The Government's Programme for Scotland 2020-2021. Available from: <https://www.gov.scot/publications/protecting-scotland-renewing-scotland-governments-programme-scotland-2020-2021/documents/>, accessed 10 December 2021.

Scottish Government (2020b) Investing for Jobs: Capital Spending Review Framework 2021-2022 to 2025-2026. Available from: <https://www.gov.scot/publications/investing-jobs-capital-spending-review-framework-2021-22-2025-26/>, accessed 10 December 2021.

Scottish Government (2020c) Securing a Green Recovery on a Path to Net Zero: Climate Change Plan 2018–2032. Available from: <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>, accessed 10 December 2021.

Scottish Government (2021a) Cleaner Air for Scotland 2: Towards a Better Place for Everyone. Available from: <https://www.gov.scot/publications/cleaner-air-scotland-2-towards-better-place-everyone/>, accessed 10 December 2021.

Scottish Government (2021b) Just Transition Commission: A National Mission for a fairer, greener Scotland. Available from: <https://www.gov.scot/publications/transition-commission-national-mission-fairer-greener-scotland/pages/5/#:~:text=%20Just%20Transition%20Commission%3A%20A%20National%20Mission%20for,supply%20chain%20and%20embed%20quality%20work...%20More%20>, accessed 10 December 2021.

Scottish Government (2021c) A Fairer, Greener Scotland: Programme for Government 2021-22. Available from: <https://www.gov.scot/publications/fairer-greener-scotland-programme-government-2021-22/>, accessed 10 December 2021.

Scottish Government (2021d) Scotland 2045: Our Fourth National Planning Framework (Draft). Available from: <https://www.gov.scot/publications/scotland-2045-fourth-national-planning-framework-draft/>, accessed 10 December 2021.

Scottish Government (2021e) Infrastructure Investment Plan for Scotland 2021-2022 to 2025 -2026. Available from: <https://www.gov.scot/policies/government-finance/infrastructure-investment/>, accessed 10 December 2021.

Scottish Government (2021f) National Performance Framework. Available from: <https://nationalperformance.gov.scot/>, accessed 10 December 2021.

Scottish Government (2021g) Investing for jobs: Capital Spending Review 2021-2022 to 2025-2026. Available from: <https://www.gov.scot/publications/investing-jobs-capital-spending-review-2021-22-2025-26/>, accessed 10 December 2021.

Scottish Government (2021h) Creating Better Ways of Living: Taking Climate Action to Reduce Car Use by 2030.

Scottish Government (2021i) Scotland's Climate Assembly – recommendations for action: SG response. Available from: <https://www.gov.scot/publications/scottish-government-response-scotlands-climate-assembly-recommendations-action/pages/3/> accessed 17 December 2021.

SNH (2020) Strategic Transport Projects Review 2 - Environmental Assessment (Scotland) Act 2005 – 01511 Scoping. SNH response sent to Transport Scotland and SEA Gateway, 7 February 2020.

Transport Scotland (2018) STAG Technical Database. Available from: <https://www.transport.gov.scot/publication/stag-technical-database/>, accessed 10 December 2021.

Transport Scotland (2020a) National Transport Strategy (NTS2) – Delivery Plan – 2020 to 2022. Available from: <https://www.transport.gov.scot/publication/national-transport-strategy-nts2-delivery-plan-2020-to-2022/>, accessed 10 December 2021.

Transport Scotland (2020b) Transport and Travel in Scotland – All editions. Available from: <https://www.transport.gov.scot/our-approach/statistics/#42764>, accessed 16 December 2021.

Transport Scotland (2021a) Initial Appraisal: Case for Change – (National and Regional) – STPR2. Available from: <https://www.transport.gov.scot/our-approach/strategy/strategic-transport-projects-review-2/>, accessed 14 January 2022.

Transport Scotland (2021b) Reported Road Casualties Scotland 2020. Available from: <https://www.transport.gov.scot/our-approach/statistics/#42762>, accessed 16 December 2021.

Transport Scotland (2021c) Scottish Transport Statistics No 39 2020. Available from: <https://www.transport.gov.scot/our-approach/statistics/#42763>, accessed 16 December 2021.

Transport Scotland (2022) A Route Map to Achieve a 20 percent Reduction in Car Kilometres by 2030. Available from: <https://www.transport.gov.scot/publication/a-route-map-to-achieve-a-20-per-cent-reduction-in-car-kilometres-by-2030/>, accessed 20 January 2022.

Transport Scotland (n.d.) The Trunk Road Network. Available from: <https://www.transport.gov.scoat/transport-network/roads/the-trunk-road-network/>, accessed 10 December 2021.

Under 2° Secretariat Climate Group (2021). Further, Faster, Together: Under2 Leaders Actions at COP26. Available from: <https://www.theclimategroup.org/further-faster-together-under2-leaders-actions-cop26>, accessed 20 December 2021.

