



## **Access to Argyll and Bute (A83)**

**Strategic Environmental Assessment**

**Draft Environmental Report for Consultation**

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**Project-specific Terminology Used in Environmental Report**

<b>Terminology</b>	<b>Description</b>
Corridor Options	Refers to the 11 route corridor options considered as part of the Preliminary Assessment, as shown on Figure 1.1. N.B. Four additional route corridors (12 to 15) arose from public consultation.
Preferred Corridor / Corridor	Refers to the preferred corridor (corridor 1), selected as a result of the Preliminary Assessment, as shown on Figure 1.2.
Possible Route Options	Refers to the five coloured options within corridor 1 collectively, as shown on Figure 5.1.
Preliminary Assessment	Refers to the initial assessment of the 15 route corridor options, with the objective of identifying if corridors can be removed from further consideration at this stage to allow more detailed consideration of those corridors remaining and recommend a preferred corridor.
Preliminary Engineering Support Services	Design Manual for Roads and Bridges (DMRB) Stage 1 Assessment to identify a preferred corridor for access to Argyll and Bute. This includes the Preliminary Assessment described above.
Project	Refers to the Access to Argyll and Bute (A83) project as a whole. Although SEAs typically assess plans, programmes and strategies, the term 'project' is used in this Environmental Report as an all-encompassing term, and is more suited to the spatial scale of corridor 1, which is the focus of this Environmental Report.

# 1. Introduction

## 1.1 Background and Need

- 1.1.1 Following recent landslide events in August 2020 at the Rest and Be Thankful on the A83 trunk road, one of which was the largest recorded in the area, Jacobs / AECOM was commissioned by Transport Scotland to undertake a Strategic Environmental Assessment (SEA) and provide preliminary engineering support services (PES) as the equivalent of a Design Manual for Roads and Bridges (DMRB) Stage 1 Assessment to identify a preferred corridor for access to Argyll and Bute. The DMRB sets a standard of good practice that has been developed principally for trunk roads. The various stages in the DMRB process are set out in detail in Section 1.2 (Context for Strategic Environmental Assessment).
- 1.1.2 The DMRB Stage 1 Assessment has reviewed the problems and opportunities relating to the existing A82, A83, A85 and A828 Trunk Roads and considered various route corridor options, including the existing A83 Trunk Road corridor. A description of the purpose and process of the SEA is provided in Section 1.5 (SEA Requirements).
- 1.1.3 The A83 Trunk Road (hereafter referred to as 'the A83') is one of only two east-west strategic trunk road network connections between Argyll and Bute and the central belt. Accidents or incidents (e.g. roadworks, landslips, flooding) occurring on any part of the A83 in Argyll and Bute can effectively cut off parts of the region for a period, with the potential to significantly impact residents, business and visitors due to the significant length of alternative routes and the travel times involved. Sections of the A83 have been noted as having higher accident rates than the national average.
- 1.1.4 As part of Transport Scotland's second Strategic Transport Projects Review (STPR2), described in Section 3.4 (Strategic Transport Projects Review 2), an Initial Appraisal: Case for Change Report (Jacobs / AECOM 2021a) was produced for the Argyll and Bute region, which set out the importance of the A83 as a 'vital artery' running through the region - a key transport corridor in need of investment. Due to the complexities of the route and the urgent need for a solution to the recurring landslides issues, it was decided that Access to Argyll and Bute (A83) project should be taken forward in parallel with the STPR2 programme and to a level of detail that would support the early stages of project delivery.
- 1.1.5 As such, there has been a need to consider the route corridor options available to improve resilience and safety for strategic traffic currently using the A83. This included examining the existing A83 corridor, as well as alternative corridors, both to the north and south of the existing route, that could provide a suitable alternative route to the A83. The 11 proposed route corridor options (shown on Figure 1.1) were presented on the Transport Scotland project website (Transport Scotland 2020a) for public consultation from September 2020 to the end of October 2020. These proposed route corridors were subject to Preliminary Assessment for the PES and SEA, which is described in Section 1.3 (Design Manual for Roads and Bridges), Section 1.4 (Access to Argyll and Bute PES) and Chapter 5 (Project Description). Four additional route corridors were suggested in feedback received from this public consultation, route corridors 12 to 15. The preferred corridor (corridor 1) identified through the Preliminary Assessment process is shown on Figure 1.2.
- 1.1.6 The reasons for the selection of corridor 1 as the preferred corridor are provided in Section 5.2 (Overview of Preliminary Assessment Process).

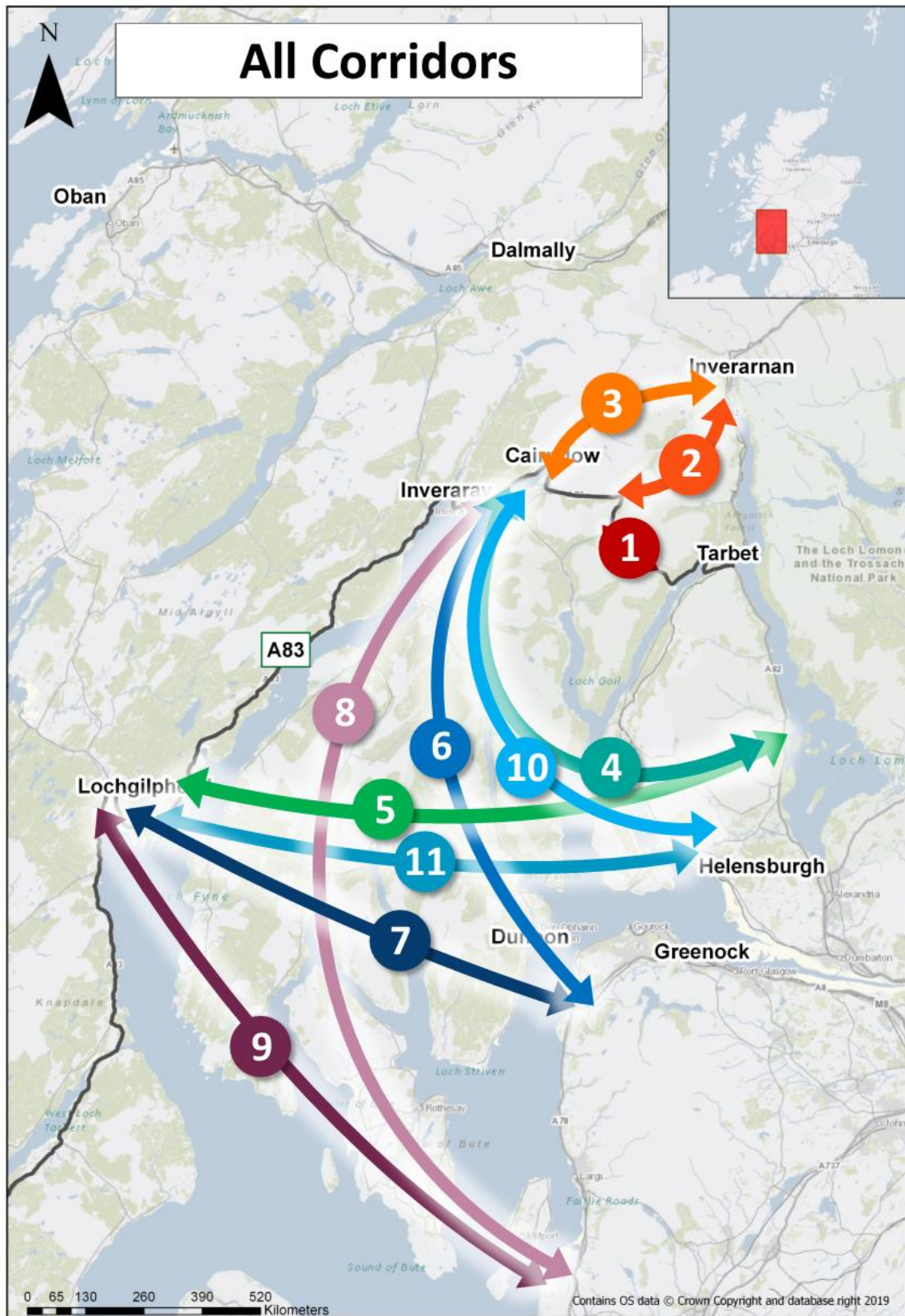


Figure 1.1: Schematic illustrating initial 11 Route Corridor Options (Transport Scotland 2020)

## **1.2 Context for Strategic Environmental Assessment (SEA)**

- 1.2.1 This Environmental Report presents the findings of the SEA undertaken for the project. SEA is a means of systematically assessing the likely impact of a public plan, programme or strategy on the environment. The Environmental Assessment (Scotland) Act 2005 transposes the requirements of the European Community SEA Directive (2001/42/EC). Under the Environmental Assessment (Scotland) Act 2005, those bodies preparing qualifying Scottish plans are required to undertake a SEA of plans that are likely to have significant environmental effects, if implemented.
- 1.2.2 The 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. The SEA also offers a foundation for future DMRB stages of a project assisting an environmentally led design.

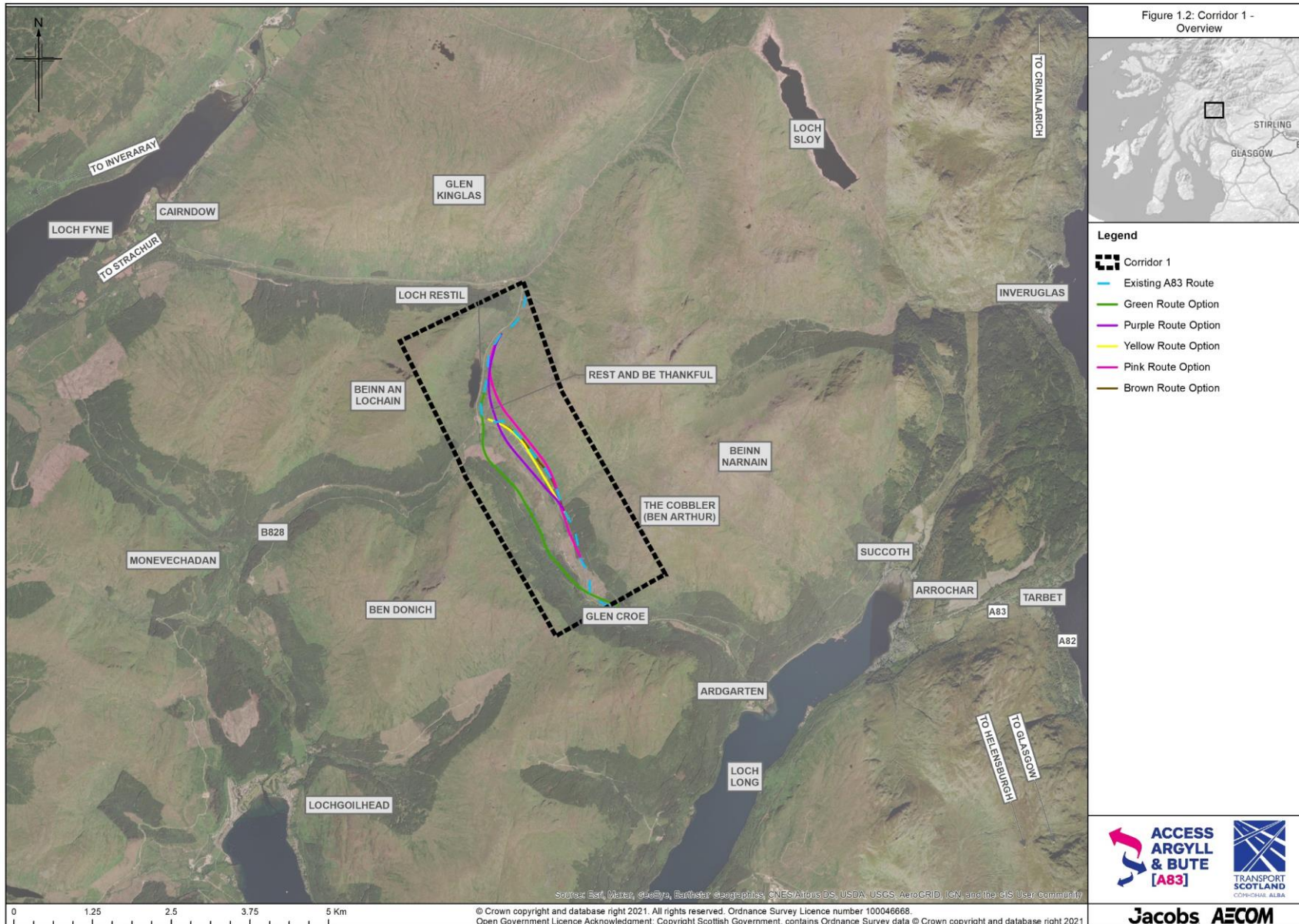
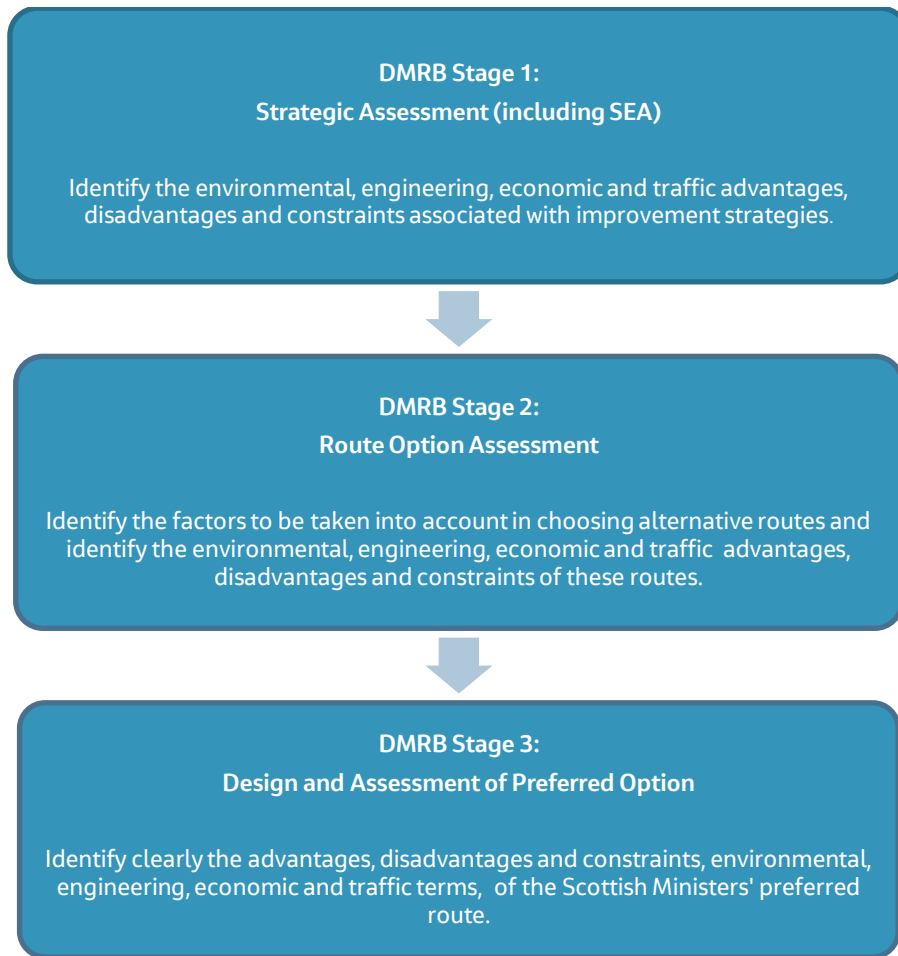


Figure 1.2: Preferred Corridor (Corridor 1) Overview

### 1.3 Design Manual for Roads and Bridges (DMRB)

- 1.3.1 As noted in paragraph 1.1.1, the SEA and PES have been undertaken as an equivalent of a DMRB Stage 1 Assessment. The DMRB is a suite of documents which contains requirements and advice relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (i.e. Transport Scotland in this case) is highway or road authority. The requirements and advice are derived from research, practical experience of constructing and operating motorway and all-purpose trunk roads, and from delivering compliance to legislative requirements (Highways England, Transport Scotland, Welsh Government, Department for Infrastructure 2018). Although the DMRB has been developed principally for trunk roads, it may also be applicable in part to other roads with similar characteristics. Where it is used for local road schemes, it is for the local roads authority to decide on the extent to which the documents in the manual are appropriate in any particular situation.
- 1.3.2 In addition to the current DMRB guidance, the Highways Agency *et al* (1993) guidance remains applicable to trunk road projects in Scotland. This now-withdrawn DMRB guidance document TD 37/93 'Scheme Assessment Reporting' divided the various chronological elements of the design development process into three stages. While this document is no longer in use and new DMRB guidance does not specify formal stages, the three stages outlined in TD 37/03 set out the key aims at each phase of design development and are still commonly referred to within the industry. As such, the three DMRB stages are mentioned throughout this Environmental Report as they provide a useful benchmark against which to set out when certain assessments would be undertaken or mitigation recommendations would be fulfilled in accordance with this SEA.
- 1.3.3 The three stages of assessment under the DMRB TD 37/93 are shown graphically in Diagram 1.1.





**Diagram 1.1: DMRB Process**

- 1.3.4 It is expected that, following publication of the PES and SEA and the statutory consultation period, the preferred corridor would progress to DMRB Stages 2 and 3 for assessment of the possible route options, design development and assessment of the preferred option. Subsequent DMRB stages and guidance documents are referred to where appropriate throughout the Environmental Report.

## **1.4 Access to Argyll and Bute PES**

- 1.4.1 The PES appraisal sets out the evidence base for problems and opportunities linked to the A83, drawing on relevant data analysis, policy review and stakeholder engagement. The PES appraisal also reports the engineering, traffic and economic assessments of the route corridors. The PES is split into two stages: Preliminary Assessment and Detailed Assessment, which are described in Chapter 5 (Project Description).
- 1.4.2 The Preliminary Assessment included a sifting exercise, supported by a preliminary environmental assessment, which was undertaken as an early, additional step to the standard statutory SEA process. This has ensured that a proportionate approach to decision making has been adopted and that environmental constraints have been an integral part of the corridor assessment and selection of the preferred corridor. Each of the 15 route corridors were assessed at a high-level against SEA topics and assessment rating criteria. This preliminary environmental assessment is provided as Appendix D (Route Corridor Options Baseline and Assessment) to this Environmental Report. Engineering, traffic, and economic technical assessments were also important considerations that informed the selection of the preferred corridor.
- 1.4.3 The purpose of the SEA is to identify any likely significant effects of the PES, by assessing any residual corridors following the Preliminary Assessment sifting exercise. This SEA Environmental Report stage therefore focuses on the preferred corridor identified during the Preliminary Assessment, corridor 1. Where any likely significant effects are identified, avoidance and mitigation measures need to be identified in the SEA. The SEA also informs the development of the more detailed design and Environmental Impact Assessment (EIA) requirements at the project level. The SEA process is described in Chapter 2 (Background to the SEA).

## **1.5 SEA Requirements**

- 1.5.1 The primary purpose of this SEA is to explore the potential for the Access to Argyll and Bute (A83) PES to lead to positive or negative significant environmental effects. A Screening Report has been prepared and is provided in Appendix A (SEA Screening). Following screening, the key remaining stages of SEA for the Access to Argyll and Bute (A83) project are:
- SEA Scoping (complete)
  - Draft Environmental Report (this stage) – The assessment stage establishes the likely significant (positive and negative) environmental effects of implementing the Access to Argyll and Bute (A83) project. Any potential reasonable alternatives have been considered at this stage, along with viable mitigation measures to avoid, reduce or offset adverse effects. The assessment and a summary of key findings have been included in the Draft Environmental Report (this document), which will be available for consultation alongside the PES.
  - SEA Post Adoption Statement – This statement will be produced after the Access to Argyll and Bute (A83) project has been adopted. It will outline how the assessment and consultation responses relating to the SEA and PES have been taken into account within the finalised Access to Argyll and Bute (A83) project. It will also include the final environmental monitoring programme for the Access to Argyll and Bute (A83) project implementation.
  - Monitoring – any significant environmental effects predicted in the SEA will need to be monitored, according to the monitoring programme set out in the Post Adoption Statement, and remedial action taken in response to the monitoring, where required.

- 1.5.2 SEA Post Adoption Statements are intended to improve the transparency of the decision-making process within projects such as the Access to Argyll and Bute (A83).
- 1.5.3 The SEA Directive topics, to be considered at all SEA stages, are:
- biodiversity, fauna and flora;<sup>1</sup>
  - population and human health;
  - water;
  - soil;
  - air;
  - climatic factors;
  - material assets;
  - cultural heritage<sup>2</sup>; and
  - landscape.
- 1.5.4 All of the SEA Directive topics listed above have been scoped in for this project.
- 1.5.5 Inter-relationships between the SEA Directive topics have been considered in this report. For example, direct effects on soil or the quality of the water environment, as a result of increasing the background levels of pollution within a specific area, could have a secondary significant effect on biodiversity. The length and duration of environmental effects and potential cumulative effects relating to these topics have also been assessed, as described in Section 6.10 and Section 8.2.
- 1.5.6 The SEA is 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).
- 1.5.7 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 2013a).
- 1.5.8 The Consultation Authorities also sit on an Environmental Steering Group (ESG) that has been formed for this project – the ESG is described in Section 4.3 (Environmental Steering Group). Feedback from the wider ESG members in addition to the Consultation Authorities will also be incorporated in the development of the SEA.
- 1.5.9 In adherence to the requirements of the Environmental Assessment (Scotland) Act 2005, screening was undertaken to determine whether the Access to Argyll and Bute (A83) project would be likely to have significant environmental effects which would require SEA. An SEA Screening Report was submitted to Transport Scotland in October 2020 (refer to Appendix A: SEA Screening).

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<sup>1</sup> Biodiversity, fauna and flora (as listed in the SEA Directive) are considered in this SEA under the title 'Biodiversity', as it is considered that this also encompasses fauna and flora and aligns with the title of DMRB guidance LA 108 'Biodiversity.'

<sup>2</sup> Cultural heritage as described in the SEA Directive includes the sub-topics of architectural and archaeological heritage. This SEA considers these sub-topics and provides a full definition of what has been assessed for cultural heritage in Appendix C (Section 8: Cultural Heritage).

- 1.5.10 SEA was proposed for the Access to Argyll and Bute (A83) project as the most appropriate and robust framework for identifying potentially significant environmental effects and opportunities at a high-level. The SEA process also ensures that stakeholders are given an early opportunity to comment on and influence the proposals. Following review of the SEA Screening Report Appendix A (SEA Screening), Transport Scotland confirmed the intention to progress with a SEA for the Access to Argyll and Bute (A83) project.

## **1.6 SEA Scoping**

- 1.6.1 The purpose of the scoping stage was to describe the environmental context, by establishing the relevant baseline information, reviewing other relevant plans, programmes and strategies (PPS) and identifying environmental problems and opportunities. The scoping stage was informed by environmental workshops and engagement, as described in Chapter 4 (Consultation and Stakeholder Engagement). The PPS review is provided in Appendix B (Plans, Policies and Strategies Review) and the detailed baseline data and assessment are provided in Appendix C (Detailed Baseline and Assessment).
- 1.6.2 The Scoping Report was intended to provide sufficient information about the Access to Argyll and Bute (A83) project and the relevant environmental baseline and PPS to allow the Consultation Authorities to provide an informed view regarding the environmental topics to be included in the SEA. The Scoping Report also provided a proposed methodology to be used for assessing these potential environmental effects.
- 1.6.3 The Scoping Report was submitted to Scotland's SEA Gateway for a statutory five week consultation in December 2020. Section 4.1 describes this and other SEA consultation requirements.
- 1.6.4 Feedback from the Consultation Authorities on the baseline, PPS and proposed methodology provided in the Scoping Report have been responded to in this Environmental Report and the responses are summarised in Appendix E (Summary of Consultation).
- 1.6.5 The approach to the remaining SEA stages after scoping, including this Environmental Report stage, is described in Chapter 6 (SEA Approach and Methods).

## **1.7 Purpose of Environmental Report**

- 1.7.1 The Environmental Report includes an assessment of the likely significant effects of the plan (the Access to Argyll and Bute A83 project) and describes the reasons for selecting the alternative(s) project option, i.e. the preferred corridor. It also includes mitigation measures and a monitoring framework.
- 1.7.2 The Environmental Report needs to describe any potentially significant effects on sites designated under Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, as amended. However, the Habitats Regulations Appraisal of the project (see Section 1.8: Related Assessments) will describe these effects in more detail.
- 1.7.3 The Environmental Report must provide an appropriate level of detail, and consider how to best provide consultees with a clear insight into the relevant environmental information that has emerged from the assessment.
- 1.7.4 This Environmental Report responds to feedback received from the consultation on the Scoping Report, and includes an appendix that shows how each feedback suggestion has been responded to. This is provided as Appendix E (Summary of Consultation) to this report. The report includes an updated version of the environmental baseline data and the PPS review that was originally used in the Scoping Report.

## 1.8 Related Assessments

### Habitats Regulations Appraisal (HRA)

- 1.8.1 The EU Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (hereafter referred to as the Habitats Directive) was adopted in 1992 (as amended). The primary aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring EU Member States to take measures to maintain or restore natural habitats and wild species of European interest listed in the Annexes to the Directive at a favourable conservation status. It also introduces robust protection for those habitats and species of European importance.
- 1.8.2 Article 6(3) of the Habitats Directive requires that any plan which is not directly connected with or necessary to the management of a European site<sup>3</sup>, but may be likely to have a significant effect on such a site, either individually or in combination with other plans or projects, shall be subject to an 'appropriate assessment' of its implications for the European site in view of the site's conservation objectives. The application of the precautionary principle is implicit in the Habitats Directive, which requires that the conservation objectives of European sites should prevail where there is uncertainty (European Commission 2001). Where scientific information is insufficient, inconclusive, or uncertain, the precautionary principle is applied. This procedure is applied in Scotland through The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), and is known as the 'Habitats Regulations Appraisal' (HRA) of plans. These regulations remain in place post 31 December 2020 when the UK exited the EU, with only minor changes introduced by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.
- 1.8.3 European 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 (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.'
- 1.8.4 Each stage in the development of the Access to Argyll and Bute (A83) project is being reviewed to determine if there might be any potential indirect or direct significant effects on European sites. As the Access to Argyll and Bute (A83) route corridors develop, including any further spatial detail or indicative maps of transport interventions, they will continue to be reviewed from an HRA perspective, as part of an HRA screening assessment. The HRA screening will identify any likely significant effects on European sites and, if such effects are identified, the next stage (Appropriate Assessment) in the assessment process will be conducted to determine if there will be any adverse effects on site integrity. This approach is similar to the approach used for the wider STPR2 HRA and will be discussed and agreed with NatureScot, the statutory nature conservation body (SNCB) for HRAs in Scotland. Discussions with NatureScot and refinement of the HRA approach will continue throughout the progression of the Access to Argyll and Bute (A83) project. The HRA reports are being produced independently of the SEA but all reports will share any relevant common data and findings.

<sup>3</sup> As of 01 January 2021, upon the UK's exit from the EU, Natura 2000 sites in Scotland are now referred to as European sites (NatureScot 2021a).

### Equalities Impact Assessment (EqIA)

- 1.8.5 Scottish Government guidance is that an Equality Impact Assessment (EqIA) should be undertaken to assess the impact of new or revised policies, practices or services against the requirements of the Public Sector Equality Duty created under the Equality Act 2010. As an EqIA is being undertaken at a policy level for STPR2, an EqIA is not considered necessary for the Access to Argyll and Bute (A83) project at DMRB Stage 1. Under DMRB GG 101, an EqIA screening shall be carried out to determine the applicability of a full EqIA at the next stages of design development. Where the EqIA screening indicates that a full EqIA is needed, an EqIA shall be carried out. The project will also need to comply with the Public Sector Equality Duty and equalities therefore need to be considered in a Construction Environmental Management Plan. For example, if a tunnel was required, the project would need to comply with DMRB CD352, Design of Road Tunnels (Highways Agency, Transport Scotland, Welsh Government and The Department for Infrastructure 2020h).
- 1.8.6 The 'Population and Human Health' assessment undertaken for the SEA has been cognisant of Transport Scotland's Scottish Transport Appraisal Guidance (2008), which considers equality effects in relation to accessibility and social inclusion. These are split into sub-criteria of community accessibility, considering access to public transport and opportunities to walk or cycle to services and facilities, and comparative accessibility, which considers the needs of socially excluded groups and communities living in disadvantaged, deprived or rural areas. The human health aspect of the assessment also considers vulnerable groups who may experience greater effects due to their health status or circumstances.
- 1.8.7 The STPR2 EqIA also incorporates an Island Communities Impact Assessment (ICIA), required by the Islands (Scotland) Act 2018. The ICIA will assess the potential impacts of STPR2 on island communities across Scotland, including Argyll and Bute. The STPR2 SEA Environmental Report and EqIA Main Report, incorporating the ICIA, is expected to be published in Summer 2021.

### Natural Capital Assessment

- 1.8.8 The over-arching A83 scheme objective TPO5 (refer to Table 2.1 in Section 2.1) is to: *'protect the environment and the benefits local communities and visitors obtain from the natural environment by enhancing natural capital assets and ecosystem service provision through delivery of sustainable transport infrastructure.'* This objective relates to the provision of ecosystem services, which requires consideration of an approach to assessing natural capital throughout the project lifecycle. 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'* (Natural Capital Forum, n.d.).
- 1.8.9 Table 1.1 sets out the proposed approach to assessing natural capital for the project, which will be undertaken concurrently with the SEA and subsequent DMRB stages.

**Table 1.1: Proposed Natural Capital Approach**

<b>DMRB Stage</b>	<b>Natural capital approach</b>
1 (this SEA stage)	<p>Alignment between the SEA and natural capital approach should be ensured through:</p> <ul style="list-style-type: none"> <li>• Developing SEA objectives which appropriately reflect the need for the protection and enhancement of natural capital (see Section 6.7 SEA Objectives)</li> <li>• Mapping SEA topics and ecosystem services (see Section 6.8 SEA Topics and Ecosystem Services)</li> <li>• Ensuring the SEA policy review includes an assessment of policy and guidance which has implications for natural capital (see Appendix B Plans, Policies and Strategies Review)</li> </ul> <p>A methodology for future stages of the natural capital assessment should be outlined, reflecting industry good practice, latest policy and guidance (including 'local' approaches from statutory consultees). The methodology will be developed should a natural capital assessment be required. This should follow a logic chain approach</p>

DMRB Stage	<i>Natural capital approach</i>
	<p>(shown below<sup>4</sup>). The methodology will be reflective of existing natural capital approaches, based in the Scottish context.</p> <p>It will be important for the <u>purpose</u> of the natural capital assessment to be defined to inform the scope. The method put forward must be commensurate with the level of detail available at each stage of environmental assessment.</p>
2	<p>During this stage of the DMRB process, a natural capital baseline should be developed. The baseline is likely to evolve, initially using nationally available datasets, prior to incorporating more detailed information. Once a baseline has been established, the impact of the route corridor should be determined through:</p> <ul style="list-style-type: none"> <li>• Identification of the change in natural capital <u>asset quantity, quality and location</u> (based upon the natural capital baseline)</li> <li>• Assumptions as to the impacts on ecosystem service provision.</li> </ul> <p>Upon determining the above, initial findings as to the scale and direction of the impacts of the project on natural capital and ecosystem services can be defined. It is likely that this will comprise a qualitative narrative, along with quantification (where possible) of habitat losses. Once impacts on natural capital assets and ecosystem services are known, high-level mitigation measures can be outlined. At DMRB Stage Two, mitigation measures will largely comprise protecting and enhancing the flow of ecosystem services and providing compensatory habitat (as examples). Opportunities to enhance habitat connectivity (and previous fragmentation in some instances) should be identified where possible. Consultation with other environmental disciplines should be a priority, to allow for shared measures which promote the greatest level of environmental protection and enhancement.</p>
3	<p>Impacts on natural capital and ecosystem service provision should be quantified where possible using additional survey outcomes and project design information. This will allow for an accessible valuation (monetary and non-monetary) exercise. The outcomes of the valuation exercise should feed into the business case for the Preferred Corridor, which will assist in communicating the benefits of the project to stakeholders and the public during engagement and consultation.</p> <p>Mitigation must be revisited in DMRB Stage 3 to form more detailed, holistic project-specific interventions and commitments, which complement the findings of the Environmental Statement. Whilst enhancement measures are often constrained as a result of compulsory purchase order boundaries and similar, efforts should be made to incorporate lateral thinking whereby opportunities for enhancement could constitute working with partner organisations beyond the project boundary to enhance natural capital.</p>

<sup>4</sup> Natural England's logic chain approach is outlined within 'Natural Capital Indicators: for defining and measuring change in natural capital (NERRO76)'. Available online at: <http://publications.naturalengland.org.uk/publication/6742480364240896#:~:text=Indicators%20are%20identified%20for%20measuring,to%20ecosystem%20services%20and%20benefits,&text=The%20aim%20is%20that%20it,measure%20change%20in%20natural%20capital>

## 1.9 Report Structure

1.9.1 This section explains how the Environmental Report is structured and sets out what is included in each chapter.

- Chapter 1 (Introduction / this chapter) summarises the general background to the Access to Argyll and Bute (A83) PES and SEA and various impact assessments required for the project.
- Chapter 2 (Background to the SEA) provides a more detailed background and policy context for the project.
- Chapter 3 (Legislative and Policy Context) summarises the key legislation and policies that inform the PES and SEA. A wider list is provided in Appendix B (Plans, Policies and Strategies Review)
- Chapter 4 (Consultation and Stakeholder Engagement) describes the approach to consultation and stakeholder engagement throughout the development of the A83 and SEA.
- Chapter 5 (Project Description) provides an overview of the preliminary appraisal process and its outcomes, including details of the methodology and scoring criteria applied for each environmental topic.
- Chapter 6 (SEA Approach and Methods) sets out the proposed approach for undertaking the SEA.
- Chapter 7 (Environmental Constraints and Opportunities) summarises the impact assessments undertaken for the corridor according to each environmental topic, and sets out key inter-relationships and potential cumulative effects.
- Chapter 8 (Inter-relationships and Cumulative Effects) outlines key inter-relationships between SEA topics and presents the cumulative effects assessment undertaken for the project.
- Chapter 9 (SEA Findings and Recommendations) summarises the outcomes of the SEA process, including key mitigation and enhancement recommendations.
- Chapter 10 (SEA Monitoring) proposes how the SEA recommendations set out in Chapter 7 should be monitored.
- Chapter 11 (Next Steps) summarises the next steps required for consultation on each of the Access to Argyll and Bute (A83) impact assessments.
- Glossary of Terms - provides a list of the technical terms used in the Environmental Report and an explanation of these.
- List of Acronyms and Abbreviations - provides a list of the full terms of the acronyms and abbreviations used throughout the Environmental Report.
- Appendix A (SEA Screening) contains the screening exercise used to determine the requirement for SEA.
- Appendix B (Plans, Policies and Strategies Review) contains a comprehensive review of the relevant PPS.
- Appendix C (Detailed Baseline and Assessment) contains the detailed environmental baseline data and impact assessments for each of the SEA topics:
  - Appendix C Section 1: Climatic Factors
  - Appendix C Section 2: Air Quality
  - Appendix C Section 3: Population and Human Health
  - Appendix C Section 4: Material Assets
  - Appendix C Section 5: Biodiversity
  - Appendix C Section 6: Water Environment
  - Appendix C Section 7: Soils
  - Appendix C Section 8: Cultural Heritage
  - Appendix C Section 9: Landscape and Visual Amenity



- Appendix D (Route Corridor Options Baseline and Assessment) contains the output of the Preliminary Assessment of the 15 route corridor options for each of the environmental topics that was undertaken as part of the SEA process.
- Appendix E (Summary of Consultation) contains a summary of the consultation responses received from the statutory and non-statutory consultees and how the SEA has responded to them.

## 2. Background to the SEA

### 2.1 Key Facts

**Table 2.1: Key Facts relating to the Access to Argyll and Bute (A83) project**

<b>Key Facts</b>	
<i>Project</i>	<i>Access to Argyll and Bute (A83)</i>
<i>Responsible Authority</i>	<i>Transport Scotland</i>
<i>Purpose of PES and SEA</i>	<i>To identify a preferred corridor for access to Argyll and Bute from the wider transport network. This will review the problems and opportunities relating to the existing A82, A83, A85 and A828 Trunk Roads and consider various route corridor options, including the existing A83 Trunk Road corridor.</i>
<i>Scheme objectives</i>	<ul style="list-style-type: none"> <li>▪ <i>TPO1 Resilience – reduce the impact of disruption for travel to, from and between key towns within Argyll &amp; Bute, and for communities accessed via the strategic road network.</i></li> <li>▪ <i>TPO2 Safety – positively contribute towards the Scottish Government’s Vision Zero road safety target by reducing accidents on the road network and their severity.</i></li> <li>▪ <i>TPO3 Economy – reduce geographic and economic inequalities within Argyll &amp; Bute through improved connectivity and resilience.</i></li> <li>▪ <i>TPO4 Sustainable travel – encourage sustainable travel to, from and within Argyll &amp; Bute through facilitating bus, active travel and sustainable travel choices.</i></li> <li>▪ <i>TPO5 Environment – protect the environment and the benefits local communities and visitors obtain from the natural environment by enhancing natural capital assets and ecosystem service provision through delivery of sustainable transport infrastructure.</i></li> </ul>
<i>Area to be Considered</i>	<i>The study area for the SEA Scoping Report included the 11 route corridor options which have undergone Preliminary Assessment (shown on Figure 1.1). Following identification of a preferred corridor, the study area for the SEA Environmental Report was reduced to the 2km wide area for corridor 1 (shown on Figure 1.2).</i>
<i>Period Covered by the PES and SEA</i>	<i>2021 - 2030</i>
<i>Frequency of Update</i>	<i>Live project with ongoing updates for the SEA Post Adoption Statement and DMRB Stages 2 and 3</i>
<i>Project Website</i>	<i><a href="https://www.transport.gov.scot/projects/a83-access-to-argyll-and-bute/">https://www.transport.gov.scot/projects/a83-access-to-argyll-and-bute/</a></i>
<i>Non-Technical Summary</i>	<i><a href="https://www.transport.gov.scot/projects/a83-access-to-argyll-and-bute/">https://www.transport.gov.scot/projects/a83-access-to-argyll-and-bute/</a></i>
<i>Contact Details</i>	<i>Comments can be provided by email to: <a href="mailto:Sinead.Thom@transport.gov.scot">Sinead.Thom@transport.gov.scot</a> and <a href="mailto:Steve.Isaac@jacobs.com">Steve.Isaac@jacobs.com</a>; or by post to: [Transport Scotland, Buchanan House, 58 Port Dundas Road, Glasgow, G4 0HF]</i>

### **3. Legislative and Policy Context**

#### **3.1 Policy Context**

3.1.1 The Access to Argyll and Bute (A83) project is supported by PPS from national and regional strategic levels in Scotland. At the national level, those most relevant and closely linked are the National Planning Framework 3 (NPF3), National Transport Strategy 2 (NTS2) and the forthcoming Strategic Transport Projects Review 2 (STPR2), which are summarised below. A comprehensive review of PPS from national and regional local strategic levels is provided in Appendix B (Plans, Policies and Strategies Review).

#### **3.2 National Planning Framework 3 (NPF3)**

3.2.1 NPF3 identifies 14 major transport, energy and environmental infrastructure projects that are of national significance to Scotland and are considered by Scottish Ministers to be essential to the delivery of the spatial strategy set out in NPF3. Although NPF3 does not specifically mention the A83 corridor improvements, improving connectivity in the Argyll and Bute region would support in achieving NPF3's aspirations of a Scotland which is a '*connected place*' (p.1). In relation to the NPF3 outcomes of '*a low carbon place*' and '*a natural, resilient place*' 2014, (p.1), construction of a trunk road project may result in potential impacts upon the natural environment. However, through appropriate design and construction management, environmental impacts would be likely to be largely temporary, can be appropriately mitigated and would not be expected to have a significant impact on the ability of the UK or Scotland to meet respective carbon reduction targets.

3.2.2 The National Planning Framework 4 (NPF4) is being prepared and will replace NPF3 and Scottish Planning Policy (SPP). NPF4 will aim to provide closer alignment with wider programmes and strategies for the next 20 to 30 years.

#### **3.3 National Transport Strategy 2 (NTS2)**

3.3.1 In February 2020, a new National Transport Strategy (NTS2) was published, outlining an updated vision over a twenty year period for a transport system which is '*sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors*' 2020 (p.4).

3.3.2 The vision is underpinned by four priorities:

- Reducing inequalities through the provision of fair, easy and affordable access to transport services.
- Taking climate action by ensuring Scotland's transport system helps deliver the Scottish Government's net-zero carbon emission target by 2045, adapts to the effects of climate change and promotes the use of sustainable travel options.
- Delivering inclusive economic growth by ensuring Scotland's transport network and services will be effectively integrated with spatial and land use planning and economic development, adapt to the changing requirements of citizens, businesses and visitors, provide reliable journey times, and use new and innovative products, services and technologies.
- Improving health and wellbeing by prioritising the prevention and reduction of incidents, promoting active travel and creating cleaner and greener places and networks within the transport system.

- 3.3.3 Overall, the various possible route options considered as part of the SEA and PES would support the aims and visions of NTS2. The existing A83 Trunk Road Corridor would fall under the 2<sup>nd</sup> tier '*Maintaining and safely operating existing assets*' of the strategies '*Sustainable Investment Hierarchy*' (p.44). The other corridors considered would fall into the 4<sup>th</sup> tier of the hierarchy and considered as '*Targeted Infrastructure Improvements*' (p.44), since they would improve the safety of the transport system; a key aim of NTS2.
- 3.3.4 Overall, establishing a safe and secure route corridor for the A83 Trunk Road would support the NTS2's aim of ensuring '*a resilient and reliable transport strategy*' (p.41), by connecting the rural area of Argyll and Bute with the urban areas within the central belt.
- 3.3.5 Argyll and Bute Council has conducted a review of NTS2 and provided recommendations to support economic growth and social inclusion within the region. As part of this, the Council has identified a need for a permanent solution to address landslip risk on the A83 Trunk Road at the Rest and Be Thankful.

### 3.4 Strategic Transport Projects Review 2

- 3.4.1 The STPR2 will inform transport investment in Scotland over the next 20 years, helping to deliver the objectives and visions for transport set out in NTS2 and aligning with other national plans such as the NPF and the Climate Change Plan.
- 3.4.2 At present, the Covid-19 pandemic restrictions and response have impacted programme progress on STPR2 and as such it is anticipated that there will be a phased approach to the review. This will consist of Phase 1, focusing on recommendations which lock in the positive benefits and travel behaviours of individuals and provide a step change in investment, supporting the priorities and outcomes of the NTS2. Phase 1 will be reported at the end of 2020. Phase 2, which will complete the review, is expected in 2021. While STPR2 is yet to be finalised, Case for Change Reports were published in February 2021, which set out the initial appraisals for the 11 STPR2 regions (Jacobs / AECOM 2021a). The Argyll and Bute Case for Change sets out the transport issues and challenges faced by the region, providing further context, including sustainability and travel statistics. Specifically, the report notes that the A83 is a '*vital artery running through Argyll*', and the A83 Rest & Be Thankful often suffers from the effects of weather-related events, such as flooding and landslips, resulting in longer journey times for users (Jacobs / AECOM 2021a, p.47). Therefore, the decision to review alternative route corridors for Access to Argyll (A83), aligns with the objectives of the Argyll and Bute Case for Change Report.

### 3.5 Climate Change Plan Update

- 3.5.1 As noted above, taking action to achieve net-zero emissions targets by 2045 is a central feature of the Scottish Government's climate change policy over the coming years. The update to Scotland's 2018-2032 Climate Change Plan builds on the work undertaken by the last two Programmes for Government (2020-2021 and 2019-2020) which have committed to delivering a Green New Deal, outlining how investments can help in reducing climate change. The update focuses on a Green Recovery from the Covid-19 pandemic and, as such, provides actions which align with the new emissions reduction targets up to 2032 since the previous plan. The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 received Royal Assent in October 2019 and set revised annual and interim emissions reduction targets to achieve the net zero by 2045 target set by the Scottish Government.
- 3.5.2 The plan identifies the vision set by NTS2 as the direction for Scotland's transport future. As outlined in paragraph 3.3.2, in addition to taking climate action, the NTS2 also aims to improve the safety and reduce inequalities of the transport system as well as delivering inclusive economic growth. The updated plan also aligns with the 2020-2021 Programme for Government in seeking a green recovery from the Covid-19 pandemic, which also commits to accelerating work '*to address the challenges faced on the A83 at the Rest and Be Thankful*' (p.114).

### 3.6 A National Mission with Local Impact – Draft Infrastructure Investment Plan for Scotland 2021-22 to 2025-26

- 3.6.1 The draft Infrastructure Investment Plan (IIP) outlines where capital invested in infrastructure will be spent, and covers the period 2021-22 to 2025-26. It includes around £24 billion of major projects and large programmes which reflect the Scottish Government's vision for future infrastructure that '*supports Scotland's resilience and enables inclusive, net zero and sustainable growth*' (p.10). This vision is underpinned by three themes: Enabling the transition to net zero emissions and environmental sustainability, driving inclusive economic growth, and building resilient and sustainable places (p.6).
- 3.6.2 The IIP aligns with NTS2 in the need to deliver the Scottish Government's ambitious net zero targets. In addition, although the Access to Argyll and Bute (A83) project is not specifically identified within the IIP, it is highlighted that future transport investment decisions will be delivered through STPR2 which will embed NTS priorities and outcomes and the Sustainable Investment Hierarchy.

### 3.7 Relationship with other PPS

- 3.7.1 SEA consideration of the Access to Argyll and Bute (A83) project, within the context of the most relevant PPS, supports the identification of wider environmental protection objectives and issues that the project should take cognisance of, and might support with its delivery.
- 3.7.2 A wide range of national and regional level policies from various PPS have been considered in the development of the PES and the SEA. The key relevant aspects of these policies are included in Appendix B (Plans, Policies and Strategies Review). A summary of the key environmental requirements and objectives identified through the review is presented in Table 3.1.
- 3.7.3 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 objectives and assessment framework.

**Table 3.1: Key Environmental Objectives and Requirements identified from PPS Review**

Topic	Key Environmental Requirements
Air Quality and Climatic Factors	<ul style="list-style-type: none"> <li>▪ Promote sustainable and active travel;</li> <li>▪ Reduce greenhouse gas emissions to align with net zero targets and national/international climate commitments; and</li> <li>▪ Enhance wellbeing, health, environment, placemaking and sustainable economic growth through improved air quality.</li> </ul>
Population and Human Health	<ul style="list-style-type: none"> <li>▪ Promote sustainable and active travel;</li> <li>▪ Improve the quality and connection of transport options to reduce inequality and promote inclusivity;</li> <li>▪ Improve safety through fewer accidents and casualties; and</li> <li>▪ Protect citizens from the harmful effects of air pollution.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>▪ Protect and enhance the natural environment, wildlife, its habitats and other natural features, including internationally and nationally designated sites.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>▪ Safeguard and maximise the multiple benefits and functions of carbon rich soils and peat.</li> </ul>
Water	<ul style="list-style-type: none"> <li>▪ Minimise flooding as a result of development;</li> <li>▪ Protect and enhance the water environment through minimising and mitigating impacts upon physical, chemical and biological quality; and</li> </ul>

Topic	Key Environmental Requirements
	<ul style="list-style-type: none"> <li>▪ 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.</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>▪ Minimise detrimental impact upon and support the preservation of the historic environment.</li> </ul>
Landscape & Visual Amenity	<ul style="list-style-type: none"> <li>▪ Protect and enhance the landscape (including the Green Belt and Countryside) due to its multitude of benefits;</li> <li>▪ Ensure that visual amenity and important views are safeguarded; and</li> <li>▪ Encourage green infrastructure.</li> </ul>
Material Assets	<ul style="list-style-type: none"> <li>▪ Promote sustainable design and innovation to reduce material consumption;</li> <li>▪ Minimise waste generation through recycling and reusing materials; and</li> <li>▪ Maintain and enhance transport infrastructure.</li> </ul>

## 4. Consultation and Stakeholder Engagement

### 4.1 SEA Consultation Requirements

4.1.1 Consultation specific to the SEA is required at several stages in line with the Scottish Government’s SEA Guidance (2013). As a minimum, the statutory SEA Consultation Authorities listed in Section 1.5 (SEA Requirements) are consulted on the need for SEA and the scope of the SEA. The findings of the assessment are outlined in the Environmental Report and a public consultation on the plan and the report must be carried out before any plan can be adopted. The principal consultation requirements are outlined in Table 4.1. The SEA Scoping Report, Draft Environmental Report and SEA Post Adoption Statement will all be consulted on via the SEA Gateway and published on the Transport Scotland website (Transport Scotland 2020a).

**Table 4.1: SEA Consultation Requirements**

Steps in the SEA	Consultation requirements in Scotland	Approximate (Consecutive) Timescales for the Project
Decision on scope and level of detail of the assessment (SEA Scoping Report)	Consult Consultation Authorities (5 week statutory minimum).	Seven weeks
Draft Environmental Report and draft plan or programme (PES)	Consult Consultation Authorities (6 - 8 weeks) Consult the public	Eight weeks
During preparation of plan or programme	Take account of Environmental Report and opinions expressed (produce second draft of Environmental Report if substantial changes are required)	Two months
Adopted plan or programme: statement and measures concerning monitoring (SEA Post Adoption Statement)	Consult Consultation Authorities Consult the public	No fixed timescale – SEA Post Adoption Statement

4.1.2 Engaging with Consultation Authorities from the beginning of the SEA process is important as each organisation brings their individual environmental expertise to the assessment process, and ensures that the consultation process undertaken by a Responsible Authority is 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).

### 4.2 Engagement with General Public

4.2.1 Consultation with the wider public is also undertaken at different stages in the SEA and is crucial for ensuring transparency in the SEA decision-making process.

4.2.2 In relation to the Access to Argyll and Bute (A83) project, Transport Scotland published details of the 11 route corridor options on its website on 23 September 2020, with a request for public feedback on local information and constraints in relation to the route corridors by 30 October 2020 (Transport Scotland 2020b). The feedback received has informed the DMRB Stage 1 data collection for the PES and SEA, assessment of corridors and Preliminary Assessment work, including environmental assessment. Four variants of corridor 1 were suggested by the general public during this consultation (route corridors 12 to 15) and these were also assessed in the Preliminary Assessment. The environmental results of this Preliminary Assessment are described in Section 5.3 (Preliminary Assessment Environmental Summary) of this report.

4.2.3 An interactive project StoryMap has been developed by the Jacobs/AECOM digital team and is available to view online: <https://storymaps.arcgis.com/stories/5c9aa6c915854ff78341a77910c68da4>

4.2.4 The StoryMap sits within Transport Scotland's Access to Argyll and Bute (A83) website to give visitors an insight into the work that has been undertaken by various teams including engineers, planners, and environmental specialists to inform the preferred corridor option selection. The StoryMap will continue to support stakeholder engagement as work on the project progresses through subsequent stages.

4.2.5 The SEA Scoping Report, Environmental Report and Post Adoption Statement will be available on Transport Scotland's website for public consultation. They will also be available on Scotland's SEA Gateway website:

<https://www.gov.scot/policies/environmental-assessment/strategic-environmental-assessment-sea/>

### 4.3 Environmental Steering Group

4.3.1 An Environmental Steering Group (ESG) has been established for the Access to Argyll and Bute (A83) project. The ESG members and terms of reference broadly follow the approach taken for other Transport Scotland projects, such as the A9 and A96 dualling programmes and their respective SEAs. The first ESG (virtual) meeting took place on 27 October 2020.

4.3.2 The ESG members comprise the following organisations:

- Transport Scotland;
- Jacobs/AECOM;
- The SEA Statutory Consultation Authorities (NatureScot, HES, SEPA);
- Argyll & Bute Council, Inverclyde Council, North Ayrshire Council, Stirling Council;
- Loch Lomond and The Trossachs National Park Authority;
- Marine Scotland; and
- Scottish Forestry.

4.3.3 Local councils were invited to the ESG based on whether the 11 route corridors for the Access to Argyll and Bute (A83) project would intersect their council areas. The ESG aims to:

- provide an opportunity for participating organisations to influence corridor option Preliminary Assessment and review emerging design proposals;
- facilitate efficient and effective two-way communication between the A83 project team and the organisations participating in the group; and
- provide an opportunity for the organisations participating in the group to discuss any issues relevant to the PES and SEA.

4.3.4 Typically, there have been monthly calls with the ESG to discuss updates and pertinent environmental and project-related issues. It is intended that the ESG will continue throughout the DMRB Stage 2 and DMRB Stage 3 assessment process to ensure robust consultee engagement and input as the project design progresses.

### 4.4 Local Authority/National Park Authority Relationship and Duties

4.4.1 Loch Lomond and the Trossachs National Park Authority (LLTNPA) was established in 2002 as an executive non-departmental public body which seeks to deliver on the statutory aims and other required function and duties outlined within the National Parks (Scotland) Act 2000. The aims for National Parks outlined within the Act, include:

- to conserve and enhance the natural and cultural heritage;



- to promote the sustainable use of the natural resources of the area;
- to promote understanding and enjoyment of the special qualities of the area by the public; and
- to promote sustainable social and economic development of the communities of the area.

4.4.2 In addition, the 2000 Act requires National Park Authorities to prepare a five-year National Park Partnership Plan which outlines the vision for the park and how all those with a responsibility are involved in achieving this vision. Further details of the Loch Lomond & the Trossachs National Park Partnership Plan (Loch Lomond & the Trossachs 2018) are provided in Appendix B (Plans, Policies and Strategies Review).

4.4.3 Geographically there is overlap between LLTNPA and the Argyll and Bute Council authority area (as shown on Figure 4.1), however both are considered separate planning authorities. As such, both are responsible for deciding planning applications within their authority areas and both have produced Local Development Plans, setting out their vision and spatial strategies (refer to Appendix B: Plans, Policies and Strategies Review).

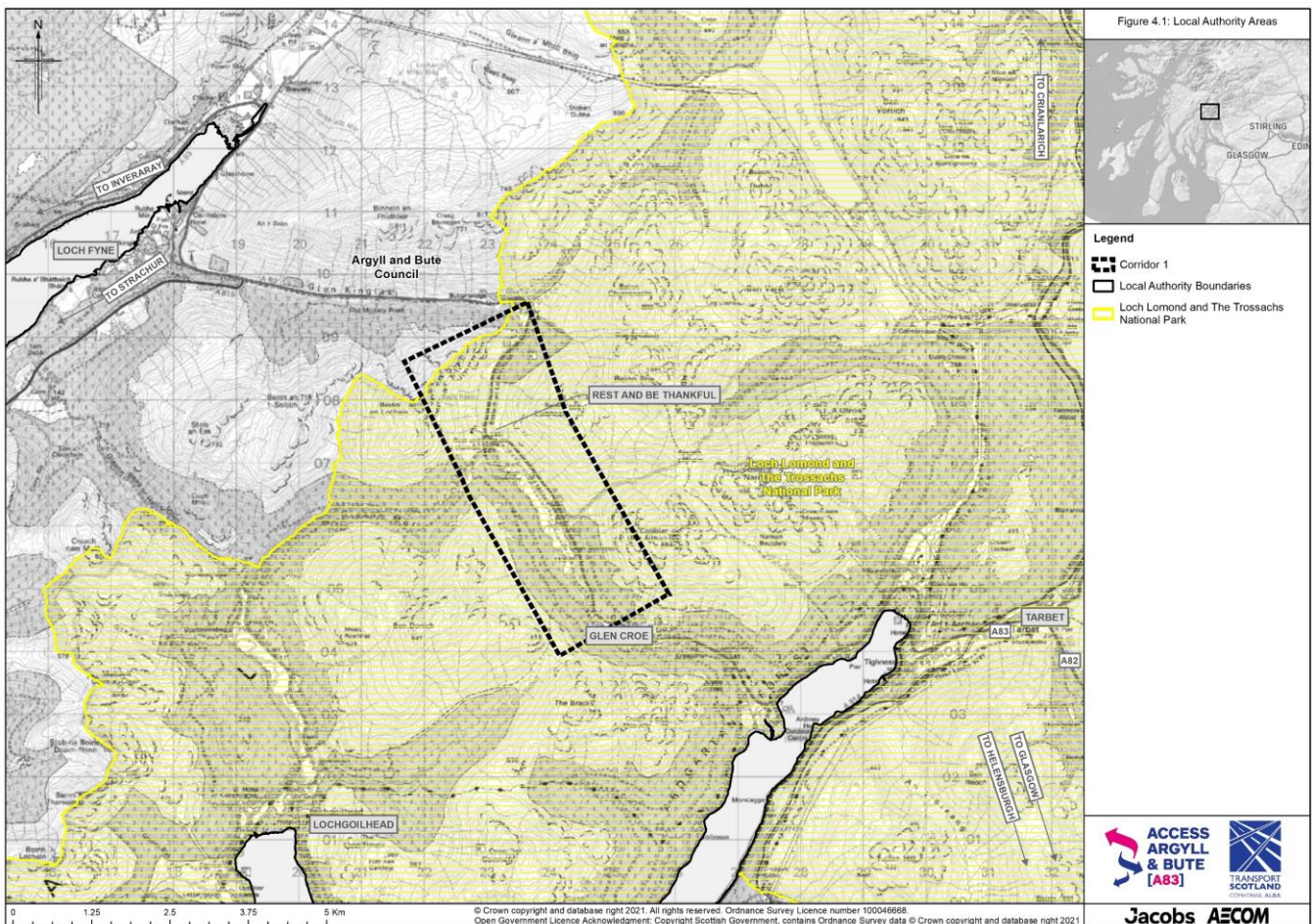


Figure 4.1: Local Authority Areas

## 4.5 Key ESG Consultation and Scoping Responses

4.5.1 Key points raised by members of the ESG are set out in this section, including responses received on the Scoping Report issued in December 2020, and how these have been considered and addressed within the SEA. For a full summary of scoping consultation, refer to Appendix E (Summary of Consultation).

### **A83 Scheme Objectives**

- 4.5.2 As outlined in Table 2.1 in Section 2.1 (Key Facts), five overarching scheme objectives have been developed over the course of the project to date. TPO5 relates specifically to the environment. Feedback received from ESG members HES and NatureScot in their scoping responses suggested that the wording of the TPO5 objective be updated to include 'protect the environment'. This change was since incorporated to the TPO5 objective, which was used in the Preliminary Assessment, as summarised in Section 5.2 (Overview of Preliminary Assessment Process and Outcomes) and Table 5.1 (Corridor Compliance with Scheme Objectives).

### **SEA Objectives and Guide Questions**

- 4.5.3 Members of the ESG were given the opportunity to provide feedback on the SEA Objectives and Guide Questions set out in Section 6.7 (SEA Objectives). As explained further in Section 6.7, the overarching SEA Objectives were developed on a national basis for the STPR2 SEA and the guide questions were amended according to the requirements of the project.
- 4.5.4 Feedback received from Scottish Forestry resulted in additional guide questions being added under the Climatic Factors, Material Assets, Water Environment and Soils topics.
- 4.5.5 Feedback received from HES, LLTNPA, and Marine Scotland resulted in the guide questions being updated from Cultural Heritage, Population and Human Health, and the Water Environment, respectively.

### **Consideration of Forestry and Woodland in this SEA**

- 4.5.6 During ESG meetings from October to December 2020, Scottish Forestry raised the point that, while SEA topics considered several environmental topics related to forestry, there was no specific section of the proposed Draft Environmental Report that would assess impacts on these assets. Scottish Forestry suggested consideration of local and regional woodland and forestry strategies and datasets of existing areas of forestry would be useful in determining potential effects on forestry within the corridor(s) with regard to landscape, soils, and biodiversity, as well as effects on the future viability of commercial operations and amenity aspects. Other ESG members, including LLTNPA and NatureScot, agreed with this and noted the wider biodiversity benefits of native and non-native woodland. Scottish Forestry also raised the potential for tree health to be a strategic issue.
- 4.5.7 In response to Scottish Forestry concerns, Jacobs/AECOM developed the approach to assessing forestry within the SEA to ensure all relevant effects would be captured. Jacobs/AECOM presented a proposed approach to assessing forestry and woodland in the SEA at the January 2021 ESG meeting, as follows:
- forestry to be discussed across the SEA topics (soils, material assets, landscape & visual, water, biodiversity), including inter-relationships. Impacts on different forestry types will be assessed at a high level;
  - SEA to consider potential effects on existing and planned forested areas, as well as identify opportunities, e.g. for additional planting (in alignment/with reference to what is set out in the various relevant Forestry Strategies and Management Plans). These plans would also be added to the PPS Review (Appendix B: Plans, Policies and Strategies Review) of this Environmental Report;
  - mitigation, enhancement and monitoring measures that relate to forestry to be described in the Environmental Report;
  - areas of commercial forestry<sup>5</sup>, woodland on the Ancient Woodland Inventory (AWI), native woodland and non-native woodland to be shown on SEA figures. These are included in Appendix C (Section 5:

<sup>5</sup> The GIS dataset for commercial forestry was not included in the figures of Appendix C (Figures C5.1 and C9.2) as the data was unsuitable for clear display.

Biodiversity, Figure C5.1 and Section 9: Landscape and Visual Amenity, Figure C9.2) and are also considered in the assessments for these topics; and

- this Environmental Report to include recommendations on how forestry strategies and management plans are considered at future DMRB stages.

4.5.8 Comments were received from Scottish Forestry on the Scoping Report in February 2020 in relation to previous comments, suggesting further relevant PPS, and querying why the approach outlined in paragraph 4.5.7 was not included. Jacobs/AECOM responded to explain that the Scoping Report would not be updated but that Scottish Forestry comments would be taken into account in this Environmental Report.

#### Landscape Character Assessment

4.5.9 Throughout the SEA consultation process, LLTNPA has provided valuable advice regarding the Landscape Character Assessment (LCA) approach. In October 2020, LLTNPA stated in an email: *'In making decisions, we do not discriminate between those parts of the National Park that have the older National Scenic Areas (NSAs) in them and those that do not. I advocate that this approach be applied in the route corridor options assessment process including SEA and subsequent EIA process at later stages.'* In relation to this point, the landscape and visual amenity assessment in Appendix C (Section 9: Landscape and Visual Amenity) has not discriminated between the parts of the National Park that have the older National Scenic Areas (NSAs) in them and those that do not. The environmental component of the Preliminary Assessment (Appendix D: Route Corridor Options Baseline and Assessment) and the SEA both describe the potential effects on the special qualities identified for all relevant areas of the National Park.

4.5.10 Additionally, at the ESG meeting in January 2020, Jacobs/AECOM queried which guidance LLTNPA would prefer to be used for the SEA. LLTNPA responded that NatureScot's LCA should be used and added that the sections on wild land areas and special landscape qualities for the National Park are particularly important to consider. As a result, Jacobs/AECOM has adopted the NatureScot National Landscape Character Assessment for undertaking the landscape assessment within the SEA presented in Appendix C (Section 9: Landscape and Visual Amenity).

#### Positive Effects for Biodiversity and Net Zero Emissions

4.5.11 Throughout the consultation process, members of the ESG – notably Argyll and Bute Council, NatureScot and LLTNPA – have raised the key issues of the Scottish Government's focus on securing positive effects for biodiversity (Biodiversity Net Gain)<sup>6</sup> as well as Scotland's Net Zero<sup>7</sup> emissions targets, and queried how these would be addressed as part of the project. Argyll and Bute Council also pointed out that the Nature Conservation (Scotland) Act 2004, requires all public bodies are required to further the conservation of biodiversity when carrying out their responsibilities.

4.5.12 Appendix C (Section 5: Biodiversity) of this report sets out a recommendation in relation to adopting the principle of securing positive effects for biodiversity throughout the project life cycle. Consideration of securing positive effects for biodiversity is set out in updated DMRB Biodiversity guidance which will be used in the subsequent stages of design development.

4.5.13 Appendix C (Section 1: Climatic Factors) refers to the Net Zero targets in relation to the project and recommends that opportunities for offsetting carbon impacts should be considered where possible throughout the lifecycle of the project.

<sup>6</sup> Biodiversity Net Gain (BNG) is development that leaves biodiversity in a better state than before. It is an approach whereby developers work with local governments, landowners, wildlife organisations, and other stakeholders to minimise impacts and maximise outputs for biodiversity. (CIEEM 2019: <https://cieem.net/wp-content/uploads/2019/06/Biodiversity-Net-Gain-in-Scotland-CIEEM-Scotland-Policy-Group.pdf>)

<sup>7</sup> The Scottish government has set itself a legally-binding target to cut greenhouse gas emissions to net zero by 2045, five years ahead of the date set for the UK as a whole.

- 4.5.14 In the March 2021 ESG meeting, NatureScot raised that securing 'positive effects for biodiversity' would be the preferred term rather than 'Biodiversity Net Gain' moving forwards. 'Positive effects for biodiversity' is the term used in the NPF 4 and in the Scottish Biodiversity Statement of Intent (Scottish Government 2020d). It was agreed that this terminology would be used in the Environmental Report and documents produced at subsequent DMRB stages.

**Marine Environment**

- 4.5.15 A comprehensive scoping response was received from Marine Scotland, including points in relation to marine baseline features such as Local Nature Reserves, Marine Conservation Orders, Marine Consultation Areas, and Priority Marine Features. A full summary of Marine Scotland comments is provided in Appendix E (Summary of Consultation); however, it should be noted that most comments provided were not applicable to corridor 1, which was taken forward from Preliminary Assessment to this Environmental Report stage of the SEA.

**Plans, Policies, and Strategies**

- 4.5.16 Throughout the consultation process, members of the ESG have provided information on PPS relevant to the project. These have been included within Appendix B (Plans, Policies and Strategies Review) and are referred to in the topics assessments presented in Appendix C (Detailed Baseline and Assessment), where relevant.

## 5. Project Description

### 5.1 Introduction

5.1.1 As the assessment has been undertaken in parallel with the wider STPR2, it has aligned with the approach set out in the STPR2: Initial Appraisal: Case for Change – Argyll & Bute Region Report' (Jacobs / AECOM 2021a) and has extended that work to recommend a preferred corridor for the A83 route.

5.1.2 The assessment for the SEA has been carried out in two stages:

- Preliminary Assessment – an initial assessment considering 15 route corridors that emerged from the STPR2 and A83 consultations, with the objective of identifying if corridors can be removed from further consideration at this stage to allow more detailed consideration of those corridors remaining and subsequently allow a recommendation on the preferred corridor.
- Detailed Assessment – detailed assessment of the residual corridor options remaining following the Preliminary Assessment (in this case only corridor 1 – Glen Croe remaining) undertaken in line with the SEA Directive and appropriate topic-specific guidance documents for environmental aspects (see Chapter 6: SEA Approach and Methods).

5.1.3 The Preliminary Assessment route corridor options were wide ranging, and alongside 'online' A83 improvements included new fixed links across the Firth of Clyde and associated Lochs offering more direct connections between the Argyll and Bute region and Helensburgh, Inverclyde and Ayrshire.

5.1.4 The 11 route corridor options initially considered, as shown on Figure 1.1, were named as follows:

- Corridor 1 – Glen Croe (Existing A83)
- Corridor 2 – Glen Kinglas
- Corridor 3 – Glen Fyne
- Corridor 4 – A82 – Cowal - Cairndow
- Corridor 5 – A82 – Cowal - Lochgilphead
- Corridor 6 – Inverclyde – Cowal - Cairndow
- Corridor 7 - Inverclyde – Cowal - Lochgilphead
- Corridor 8 – divided into 8a and 8b (8a – North Ayrshire – Cairndow via Colintrave; 8b – North Ayrshire – Cairndow via Dunoon)
- Corridor 9 – North Ayrshire – Cowal - Lochgilphead
- Corridor 10 – Helensburgh – Cowal - Cairndow
- Corridor 11 - Helensburgh – Cowal - Lochgilphead

5.1.5 In addition to the 11 route corridors listed above, four additional route corridors were proposed by members of the public through the consultation held in September and October 2020 (Transport Scotland 2020a). These four route corridors are all variants of corridor 1, as follows:

- Corridor 12 – A82 Inveruglas to A83 Butterbridge
- Corridor 13 – Glen Loin
- Corridor 14 – Coilessan Glen
- Corridor 15 – Arrochar to Butterbridge

5.1.6 A full description of the 15 route corridor options is provided in the Preliminary Assessment Report. The preliminary environmental assessment of the 15 route corridors is provided in Appendix D (Route Corridor Options Baseline and Assessment) of this Environmental Report.

## **5.2 Overview of Preliminary Assessment Process and Outcomes**

5.2.1 The 15 route corridor options considered in the Preliminary Assessment have been tested to determine compliance with the five scheme objectives, set out in Section 2.1 (Key Facts).

5.2.2 The route corridor options were assessed against a range of criteria, including environmental criteria (see Section 5.3), to determine which options merit further consideration. This is a proportionate method to obtain transparency in early decision making and to target resources for the next stages of the assessment.

5.2.3 Assessment summary tables (ASTs) were produced, testing against a range of technical criteria as well as the scheme objectives.

### **Preliminary Assessment Workshop**

5.2.4 Following the production of the draft ASTs, a Preliminary Assessment workshop was held on 16 December 2020, with representatives of Transport Scotland and their consultants, Jacobs/AECOM.

5.2.5 The workshop was held virtually using MS Teams with presentation slides used to share the key information points during the workshop.

5.2.6 The purpose of the workshop was to review the Preliminary Assessment work and to identify if route corridors could be removed from further consideration at this stage. This would then facilitate more detailed consideration of those corridors retained, through the SEA and associated PES, to allow a recommendation on a preferred corridor to be made by Spring 2021.

5.2.7 The workshop was structured to allow each discipline to outline the key issues associated with the route corridors, the overall assessment that had been undertaken on the route corridors and to explain the rationale behind the draft recommendations for removing certain route corridor options and retaining the remaining route corridor options.

### **Summary of the Preliminary Assessment**

5.2.8 Following the initial assessment work progressed, the workshop held with Transport Scotland, and the completion of further work undertaken following the workshop, the emerging recommendation was confirmed as follows:

5.2.9 The Preliminary Assessment recommended that corridor 1 be retained as the preferred route corridor based on the following conclusions. Some of these directly relate to the SEA and the others are wider project considerations:

- the environmental impacts within corridor 1 will be significantly less (see Section 5.3);
- scheme objectives show some benefit, although other route corridors may perform better except in relation to environmental benefits;
- traffic and safety benefits are not significant overall, but improved resilience is noted;
- it is likely that a solution can be delivered most quickly and cost effectively; and
- there are some engineering complexities, particularly geotechnical and structural but potentially less and different than other route corridors which have major challenges with bridges at the upper limits of technology and longer tunnels than would be required for corridor 1.

- 5.2.10 Route corridors 4, 5 and 7 were identified in the preliminary assessment workshop as being potentially considered for further assessment, but these were discounted as they do not offer any advantages over corridor 1. These route corridors are summarised as:
- extremely high cost and timescale for implementation compared to corridor 1;
  - there is further engineering complexity compared to corridor 1; and
  - potential for some internal connectivity benefits to be achieved through minor upgrades of the wider trunk road network in the region.
- 5.2.11 Route corridors 12 – 15, which were proposed by the public, are recommended to be discounted as they do not offer any advantages over corridor 1. These route corridors are summarised as:
- cost and time for completion are greater than corridor 1; and
  - there is further engineering complexity compared to corridor 1.
- 5.2.12 Table 5.1 shows the assessment rating for the compliance check of each route corridor option against the scheme objectives.
- 5.2.13 Compliance with the scheme objectives needs to be balanced against the deliverability of the project and programme and cost implications to properly inform decision making. In this case, the timescale to deliver a solution is a critical issue and one reflected in the stakeholder and public engagement. As a result of the assessment against the scheme objectives; the environmental, engineering, constructability and traffic deliverability and performance; and the programme and cost implications, the Preliminary Assessment recommended that all corridors except corridor 1 should be discounted from further consideration in the immediate term, i.e. during DMRB Stage 1.

Table 5.1: Corridor compliance with scheme objectives

Scheme Objective		Route Corridor															
		1	2	3	4	5	6	7	8a	8b	9	10	11	12	13	14	15
TPO1	Resilience – reduce the impact of disruption for travel to, from and between key towns within Argyll & Bute, and for communities accessed via the strategic road network	+	+	+	+	+++	+	+++	+	+	+	+	+++	++	++	++	++
TPO2	Safety – positively contribute towards the Scottish Government’s Vision Zero road safety target by reducing accidents on the road network and their severity	+	+	+	+	++	0	++	0	0	++	+	++	+	+	+	+
TPO3	Economy – reduce geographic and economic inequalities within Argyll & Bute through improved connectivity and resilience	+	+	+	++	++	++	++	++	++	++	++	++	+	+	+	+
TPO4	Sustainable travel – encourage sustainable travel to, from and within Argyll & Bute through facilitating bus, active travel and sustainable travel choices	0	0	0	+	+	+	+	+	+	+	+	+	0	0	0	0
TPO5	Environment – Protect the environment and the benefits local communities and visitors obtain from the natural environment by enhancing natural capital assets and ecosystem service provision through delivery of sustainable transport infrastructure	-	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



## 5.3 Preliminary Assessment Environmental Summary

5.3.1 Environmental constraints were considered as part of the Preliminary Assessment and have been further analysed as part of the SEA. Constraints within the 15 route corridor options - for example, internationally and nationally designated sites - present a risk to obtaining consent for the project due to the potential for irreversible significant effects. The difficulty in reducing significant effects to an acceptable level could result in failure to meet environmental targets and non-compliance with legislation. Table 5.2 sets out the SEA topics and the key environmental constraints in each route corridor, including the four corridor 1 variants that arose from public consultation (route corridors 12 to 15).

**Table 5.2: Preliminary Assessment Key Environmental Constraints**

SEA Topic	Key Constraints identified in the Preliminary Assessment
<b>Cultural Heritage</b>	<p>The highest number/ density of cultural heritage resources are found in <b>route corridors 8a, 8b and 9</b> and would be difficult to avoid. There is also a high level of cultural heritage resources in corridors 5, 6, 7, 10 and 11.</p> <p>For the four corridor 1 variants, the most significant cultural heritage constraints were identified in <b>route corridor 14</b>.</p>
<b>Biodiversity</b>	<p>Potential for significant loss of habitat from internationally designated ecological site Glen Etive and Glen Fyne Special Protection Area (SPA), for <b>route corridors 2, 3, 4, 6, 8A, 8B and 10</b>.</p> <p><b>Corridor 1</b> presents the fewest biodiversity constraints, however the potential loss of nationally designated Beinn an Lochain Site of Special Scientific Interest (SSSI) habitat could still be significant.</p> <p>Major negative impacts were predicted for biodiversity for <b>route corridors 12 – 15</b>.</p>
<b>Soils</b>	<p>Potential for loss of high value (Class 1 and 2) peat and Geological Conservation Review (GCR) sites in <b>route corridors 2 and 3</b>.</p> <p>Minor negative or uncertain adverse impacts were identified for soil resources in <b>route corridors 12 – 15</b>.</p>
<b>Landscape and visual</b>	<p>Major negative impacts are predicted for <b>all route corridors</b> but most - if not all - landscape impacts could be significantly reduced with mitigation. Existing routes and smaller footprints are preferred.</p> <p>Major negative impacts are predicted for landscape and visual amenity for <b>route corridors 12 – 15</b>.</p>
<b>Material Assets and Climatic Factors</b>	<p>There would be a relatively high level of material usage and associated carbon for <b>route corridors 6, 7, 8a, 8b, 9, 10 and 11</b>, with 9 to 11 performing the worst.</p> <p>For the four corridor 1 variants, the most significant material assets and climate constraints were identified in <b>route corridors 14 and 15</b>.</p>
<b>Water Environment</b>	<p>The shorter route corridors crossing fewer watercourses and floodplains are more advantageous (<b>route corridors 1 – 3</b>) than the longer routes with significantly higher numbers of crossings.</p> <p>Major negative impacts are predicted for water environment for <b>route corridors 12 – 15</b>.</p>
<b>Population and Human Health</b>	<p><b>Route corridors 8a, 8b, 9 and 11</b> are least favourable in terms of potential construction impacts such as dust and noise and vibration, or longer term disturbance to settlements (there are a larger number of settlements or greater population density within these route corridors).</p>

SEA Topic	Key Constraints identified in the Preliminary Assessment
	Minor negative or uncertain adverse impacts were predicted for Population and Human Health for route corridors 12 – 15.

- 5.3.2 In summary, route corridors 2, 3, 8a, 8b, 9, 10, 11 presented the most numerous and difficult to mitigate environmental constraints, with corridors 5, 6 and 7 having the next highest level of environmental constraints. These corridors contained environmental constraints that were either designated for their importance, had a high degree of sensitivity, or were clustered in such a way that avoidance or mitigation would be very difficult to achieve. They were therefore expected to present the highest risk in terms of the project obtaining consent. The remaining corridors, 4 and 1, were expected to present a medium risk of obtaining consent, with corridor 1 having the lowest risk of all route corridor options. The four corridor 1 variants that arose from public consultation (route corridors 12 – 15) were also assessed to have a high or medium risk of obtaining consent. For corridors 2 to 11, the most significant environmental constraints were identified for the climatic factors, biodiversity, water environment, soils, cultural heritage and landscape and visual amenity SEA topics.
- 5.3.3 For route corridors 12 - 15, the most significant and difficult to mitigate environmental constraints were identified for corridors 14 and 15. Either minor negative or moderate (or above) adverse constraints were predicted for route corridors 12 – 15 and no positive effects were predicted.
- 5.3.4 For route corridors 12 - 15, the most significant environmental constraints were identified for the climatic factors, air quality, biodiversity, water environment and landscape and visual amenity SEA topics.
- 5.3.5 The results of the Preliminary Assessment for the SEA topics are presented in Appendix D (Route Corridor Options Baseline and Assessment). It should be noted that while these ASTs present only the environmental aspects of the assessment, other considerations were taken into account when selecting a preferred corridor, including engineering, traffic and cost implications.

## 5.4 Preferred Corridor

- 5.4.1 The preferred corridor, corridor 1, generally follows the existing A83 Trunk Road, starting just south east of the junction between the A83 Trunk Road and the Old Military Road. It typically follows the route of the existing A83 Trunk Road as it rises through Glen Croe and then past Loch Restil. The corridor ends where the A83 Trunk Road passes by the south west end of Glen Kinglas. The corridor is approximately 6.0km long.
- 5.4.2 The corridor was identified in the 'A83 Trunk Road Route Study, Part A - A83 Rest and Be Thankful' Report, published in 2013. It currently provides an access route into Argyll and Bute and within the corridor there are options available to improve the existing road or provide off-line routes to address the landslide risk.
- 5.4.3 The five possible route options under consideration have been produced from the initial stages of engineering design as a means of determining the feasibility of potential routes in the preferred corridor. The alignment of the possible route options has also been informed by initial environmental appraisal work undertaken for the Preliminary Assessment. These possible route options will undergo design changes and refinements at the next DMRB assessment stage. Some of the possible route options will be removed from further consideration and there is also potential for additional route options to arise.

- 5.4.4 The location and extents of corridor 1 are shown on Figure 1.2, and the possible route options currently being considered within corridor 1 are shown on Figure 5.1. InfraWorks® images (annotated screenshots)<sup>8</sup> and descriptions of the possible route options are provided on the following pages. The InfraWorks® images show areas of green shading, which represents indicative fill or embankment, and red shading, which represents indicative areas of cutting and excavation.

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<sup>8</sup> InfraWorks® civil infrastructure conceptual design software lets Architecture, Engineering and Construction professionals model, analyse, and visualise their design concepts within a real-world context of the built and natural environment - improving decision making and project outcomes. (Source: <https://www.autodesk.com/products/infraworks/overview?plc=IW360P&term=1-YEAR&support=ADVANCED&quantity=> )

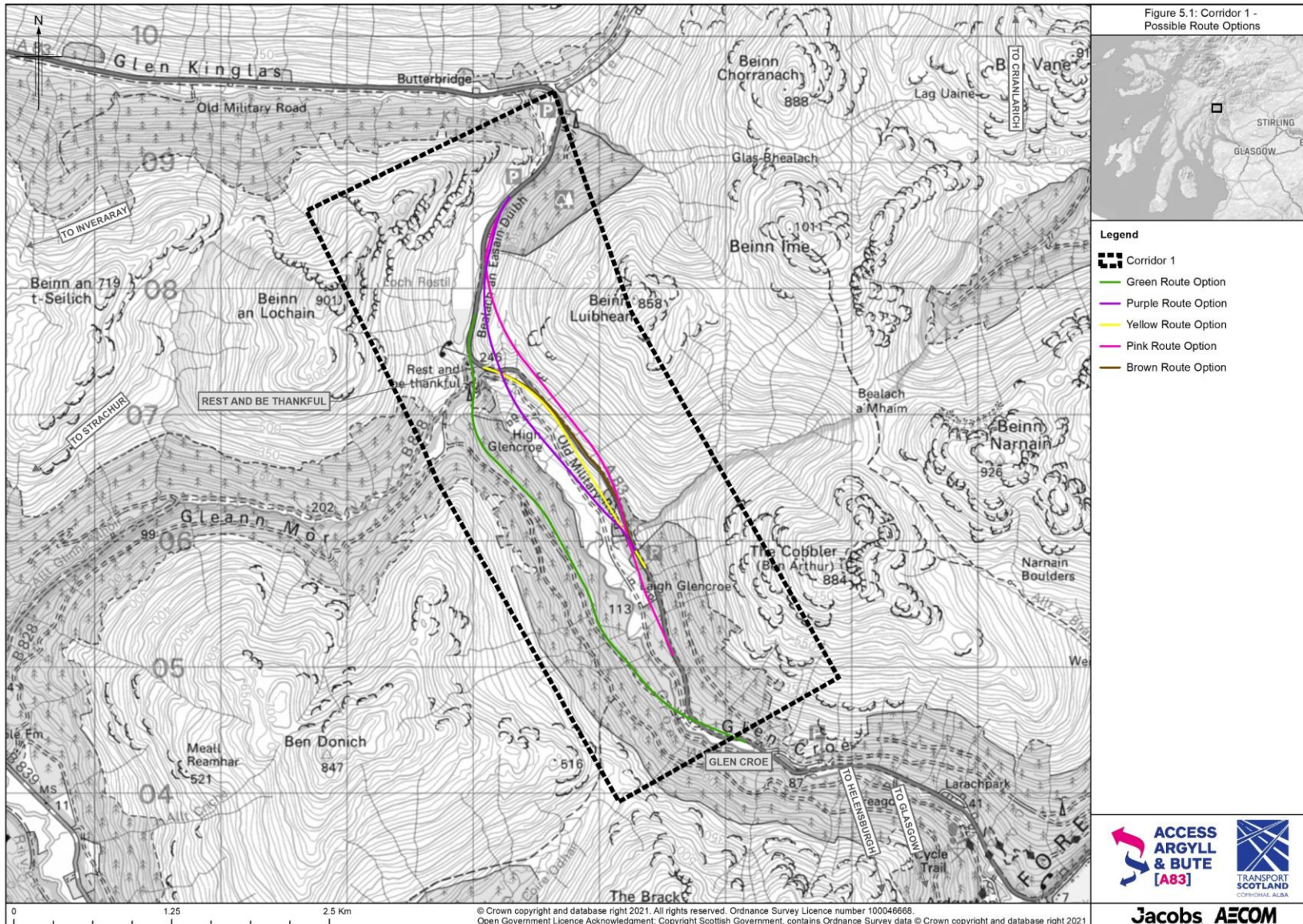
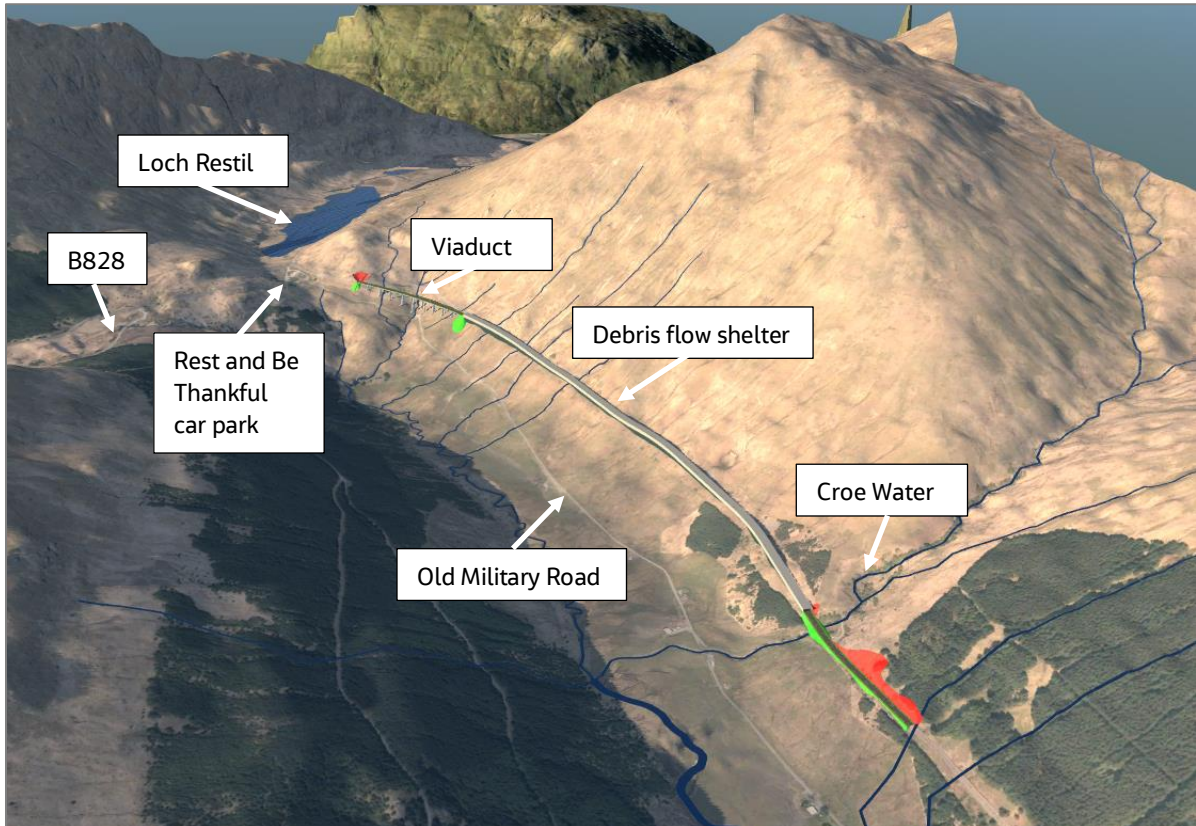


Figure 5.1: Corridor 1 – Possible Route Options

### Brown Route Option



**Image 1: Corridor 1 – Brown route option InfraWorks® screenshot**

- 5.4.5 The Brown route option closely follows the alignment of the existing A83 Trunk Road from the Croe Water heading north to the Rest and Be Thankful car park.
- 5.4.6 This possible route option would involve the construction of a debris flow shelter over a length of approximately 1.3km to protect the road and road users in the event of future debris flow events. Debris flow shelters are structures that would form canopies over the road to protect it from any landslide debris from the slopes above. A debris flow shelter along the existing A83 Trunk Road as proposed would also have to be designed and built to withstand potential impacts from large boulders from above. These structures are constructed to allow any future landslides and watercourses to pass over the top of the structure and continue downhill without disrupting the road or traffic below. Water would be carried by pre-formed channels crossing the top of the structure, enabling water to continue to flow downhill.
- 5.4.7 These structures could be built over the existing road. However, the road would need to be widened to accommodate the debris flow shelter and maintain the required carriageway width. This would present considerable challenges in being able to keep the A83 Trunk Road open to traffic for the duration of the construction works.
- 5.4.8 A viaduct approximately 0.3km long would be considered where the debris shelter finishes to improve the road alignment on the approach to the Rest and Be Thankful car park.

### Yellow Route Option

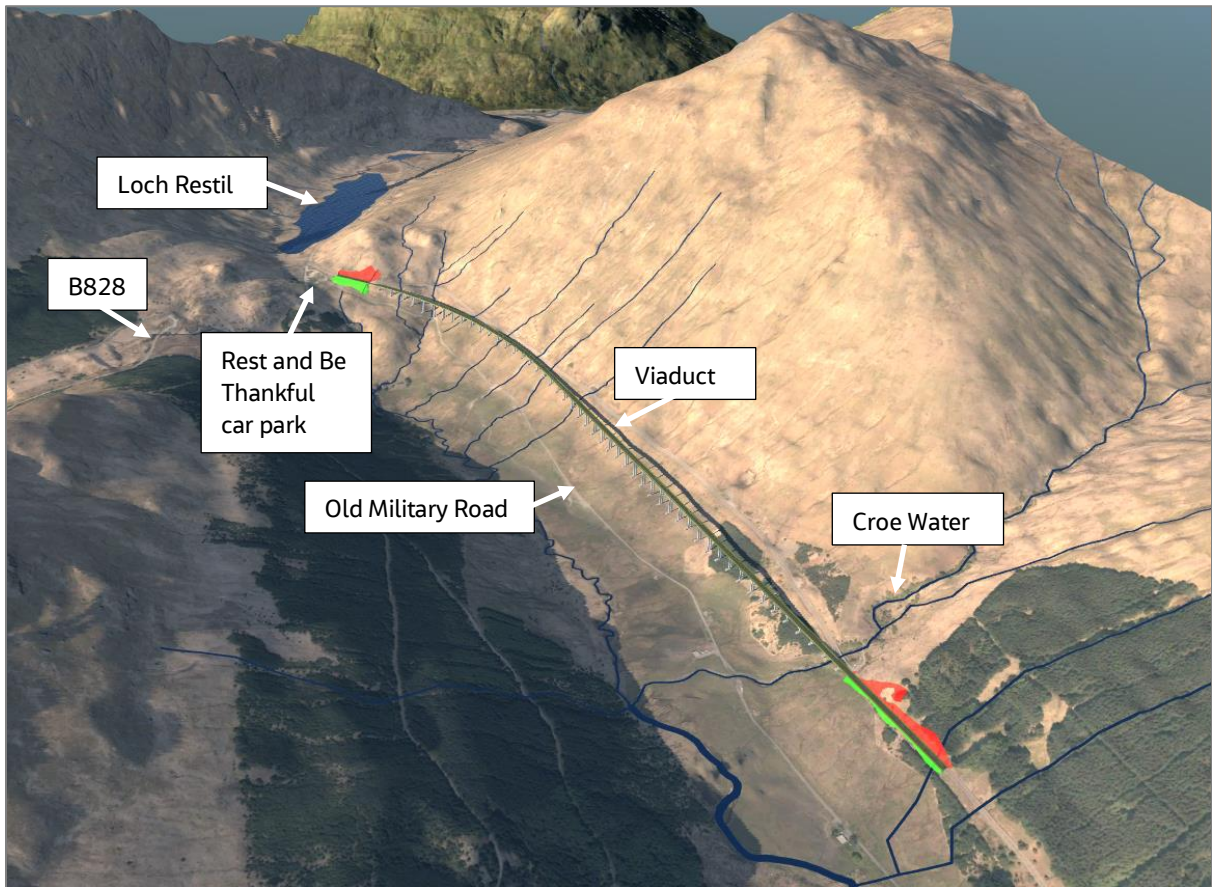
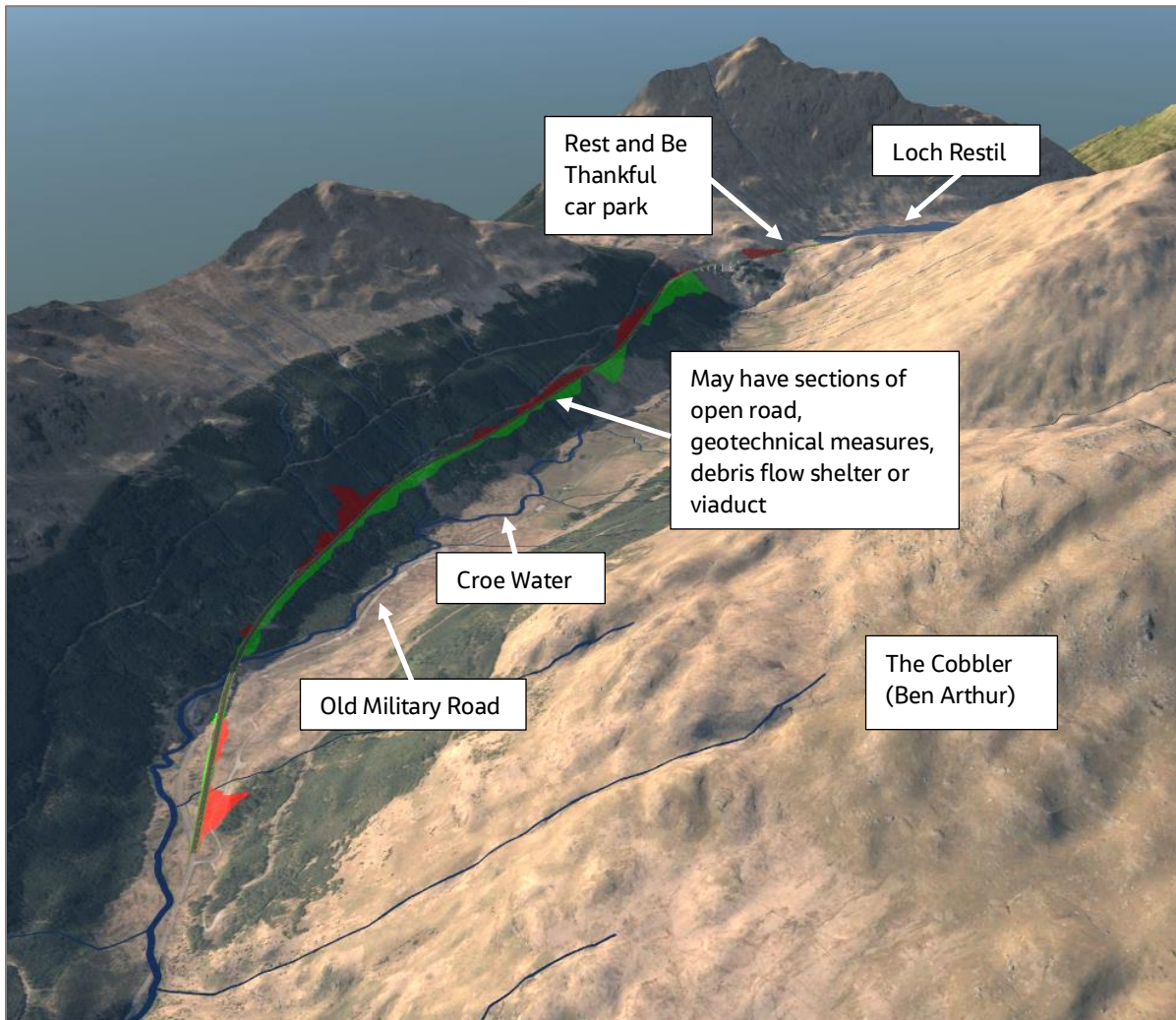


Image 2: Corridor 1 – Yellow route option InfraWorks® screenshot

- 5.4.9 The Yellow route option would see a new single carriageway road, approximately 2.1km long running between the existing A83 Trunk Road and the Old Military Road. It would have a similar average gradient as the existing road of approximately 5.3%.
- 5.4.10 This possible route option would include a length of new carriageway on a viaduct approximately 1.8km long from Croe Water to the Rest and Be Thankful car park along the base of the west-facing slopes of Beinn Luibhean where the landslide risk is significant.
- 5.4.11 The viaduct would vary in height along its length, with a maximum pier height of approximately 37m and spans between the supporting piers of approximately 40m to 70m. The position of the viaduct and the piers would need to be situated to allow the existing A83 Trunk Road and the Old Military Road to remain open during its construction. It would also need to span the larger channels from the upper slope which could act as a pathway for any future significant flows of debris. The viaduct piers would also require deflector structures to ensure that they were protected from any future landslides in that area.

### Green Route Option



**Image 3: Corridor 1 – Green route option InfraWorks® screenshot**

- 5.4.12 The Green route option would involve the construction of a new single carriageway road, around 4.3km long on the opposite side of the valley to the existing A83 Trunk Road, through an area of land managed by Forestry and Land Scotland.
- 5.4.13 This possible route option would meet the existing A83 Trunk Road south of the Forestry Access Track, and the Old Military Road junction which is currently used as an alternative route. It would cross the valley floor and the Croe Water by a viaduct for about 0.2km.
- 5.4.14 The possible new road would generally follow the existing forestry access track. It would have a similar average gradient as the existing road of approximately 5.0%. Along this section, landslide mitigation works (e.g. viaducts, debris shelters and/or debris fencing) are likely to be required to protect the proposed road from future landslides. A length of viaduct approximately 0.3km long would be required for the new carriageway to span the gully located to the north-west of High Glen Croe, across the north-west side of the Rest and Be Thankful car park before joining the A83 Trunk Road north of the existing junction with the B828 local road.
- 5.4.15 This possible route option would require a new realigned junction at the A83/ B828 intersection as well as a section of the Rest and Be Thankful car park to be repositioned.

### Purple Route Option

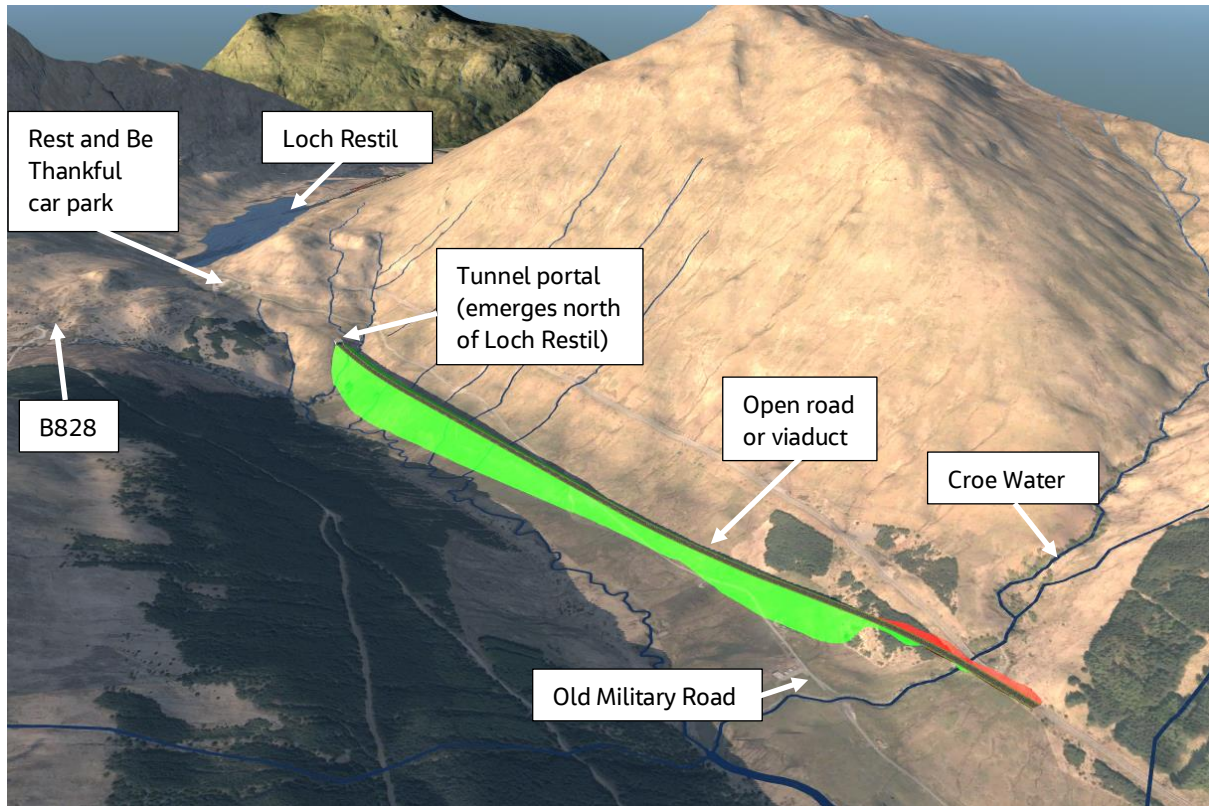


Image 4: Corridor 1 – Purple route option InfraWorks® screenshot

- 5.4.16 The Purple route option would see a new single carriageway of around 3.2km running along the Glen Croe valley floor. This possible route would run from the existing A83 Trunk Road south of the Croe Water crossing, gradually dropping down the side of the slope towards the valley floor before crossing the existing Old Military Road along an embankment.
- 5.4.17 This possible route option would then run generally north-west between the Old Military Road and Croe Water as either an open road with an average gradient of approximately 5.5% and along an embankment of up to 50m in height above the existing ground, or alternatively along a viaduct. The route would then enter a tunnel approximately 1.2km long passing under the Old Military Road and the A83 Trunk Road near High Glen Croe. The tunnel would climb from High Glen Croe at an average gradient of approximately 4% and the road would re-emerge next to the junction between the A83 Trunk Road and an existing access track north of Loch Restil, before re-joining the existing A83 Trunk Road.
- 5.4.18 The tunnel portals (entrance/exit) will be positioned to take account of the risks of landslides within the area and these, along with the sections of the carriageway on the approaches to the tunnel, may require additional landslide protection mitigation works to be undertaken. For this possible route option, the B828 local road would likely be extended to the north tunnel portal by using part of the existing A83 Trunk Road from the Rest and Be Thankful car park and a new junction created with the A83.



### Pink Route Option

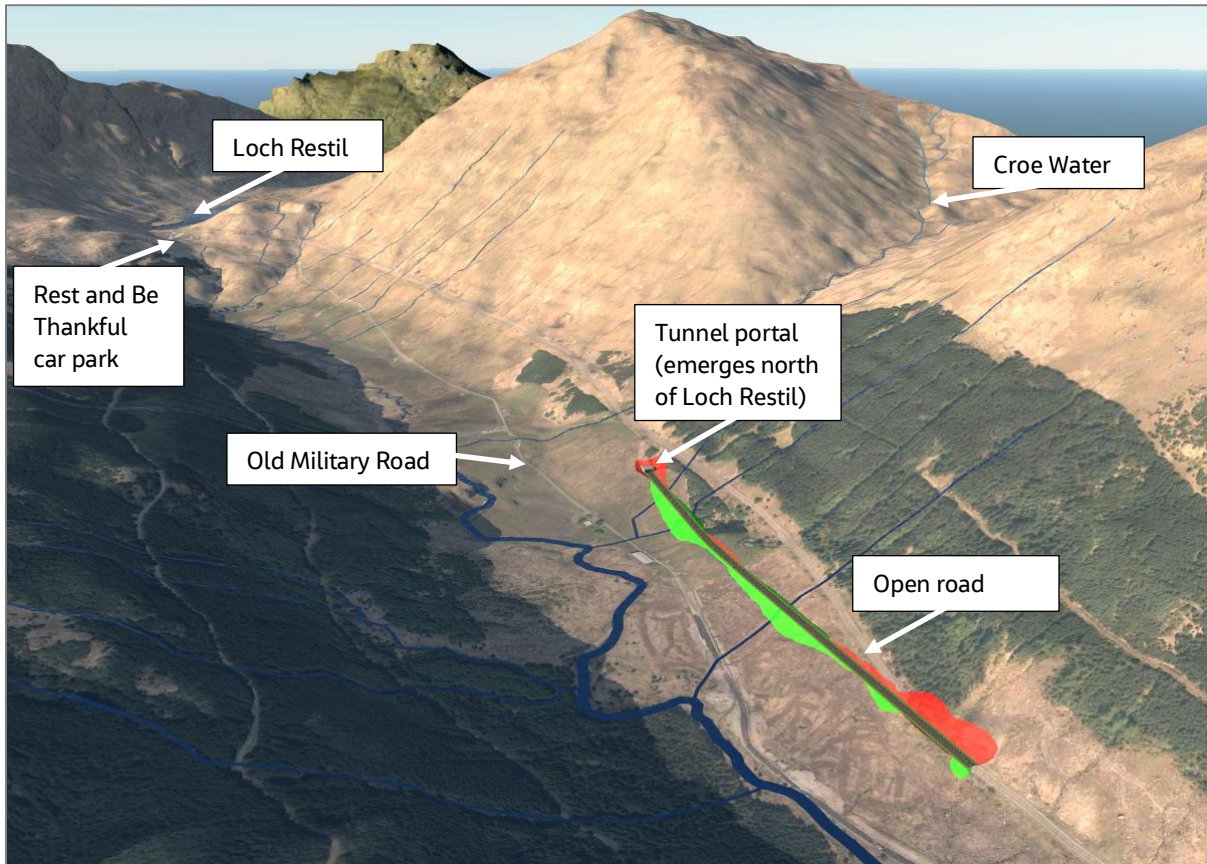


Image 5: Corridor 1 – Pink route option InfraWorks® screenshot

- 5.4.19 The Pink route option would involve constructing a new single carriageway road approximately 4.1km long, of which around 2.9km would be within a tunnel. This possible route would tie into the existing A83 Trunk Road approximately 1.0km south of Croe Water, with the new road running between the existing A83 Trunk Road and Croe Water. This section of the route would be an open road, approximately 0.7km in length, with a gradient of approximately 2.7%, generally at ground level with embankments on the approach to the southern tunnel portal (entrance/exit).
- 5.4.20 This possible route option would then enter the tunnel, which would be offset down the slope from the A83 Trunk Road and approximately 0.3km south of Croe Water. The tunnel would pass beneath Croe Water and the A83 Trunk Road, climbing at an approximate 4% gradient and would emerge next to the junction between the A83 Trunk Road and an existing access road north of Loch Restil before re-joining the A83 Trunk Road.
- 5.4.21 The tunnel portals would be positioned to take account of the risks of landslides within the area and these, along with the sections of carriageway on the approaches to the tunnel, may require additional landslide protection mitigation works to be undertaken. For this possible route option the B828 local road would likely be extended to the north tunnel portal by using part of the existing A83 Trunk Road from the Rest and Be Thankful car park and a new junction created with the A83.

## 6. SEA Approach and Methods

### 6.1 Guidance

6.1.1 The SEA has primarily followed the Scottish Government (2013) SEA Guidance and guidance for specific SEA topics or sub-topics, where relevant, as described in Section 6.4 (Topic-specific Methodology). Cognisance has also been given to A Practical Guide to the Strategic Environmental Assessment Directive (ODPM 2005).

6.1.2 The SEA for the project broadly aligns with the SEA being produced for STPR2 due to the close relationship of these strategies, as discussed in Section 1.1 (Background and Need).

### 6.2 Assessment Overview

6.2.1 Key aims of the SEA process are as follows:

- to influence each stage of the PES and the selection of a preferred corridor;
- to facilitate the identification and assessment of reasonable alternatives to meet the scheme objectives, at an early stage; and
- to identify any significant environmental effects early enough to effectively avoid or mitigate them.

6.2.2 The assessment of the 15 route corridor options and the preferred corridor (corridor 1) by the SEA team has considered comments from the SEA Scoping Report consultation and from the ESG meetings, and any proposed changes to the methodology have been made where necessary. Feedback on the methodology received from the ESG, and the SEA response to this feedback, is provided in Appendix E (Summary of Consultation).

### 6.3 Alternatives Considered

6.3.1 It is considered that the previous work undertaken for STPR2 set out in the Initial Appraisal: Case for Change Report – Argyll and Bute (Jacobs / AECOM 2021a), and the Preliminary Assessment undertaken against the SEA topics appropriately addresses the requirement of the in Environmental Assessment (Scotland) Act 2005, Part 2, Section 14 to consider '*reasonable alternatives to the plan or programme.*' The identification of environmental constraints at the Preliminary Assessment stage in relation to the 15 route corridors influenced the selection of corridor 1 as the preferred corridor in the immediate term. As the five possible route options identified in corridor 1 only have indicative alignments at this stage, there are also alternative alignments that can be proposed for these possible route options at DMRB Stage 2 – for example, to avoid a sensitive environmental receptor.

### 6.4 Topic Specific Methodology

6.4.1 During the Preliminary Assessment and SEA scoping it was recognised that some SEA topics may exert more influence over the corridor selection than others, due to the unique environmental character and constraints present within the 15 route corridors. As a result, certain topics were considered to present the potential for a higher likelihood or intensity of negative impacts across some of the corridors. While having the greatest potential for negative impacts, careful consideration of these topics at the early DMRB stages also offers increased opportunities for enhancement. These prominent SEA topics were identified as:

- biodiversity (impacts on ecology, including designated sites);
- water environment (impacts on flood risk, water quality and hydromorphology);
- cultural heritage (impacts on designated/undesignated cultural heritage resources and/or their setting); and

- landscape and visual amenity (impacts on designated and non-designated landscapes and views).

6.4.2 A desk-based assessment approach was used for all SEA topics. This focussed on the 2km corridor area, based on the SEA Objectives and Guide Questions and assessment scoring criteria set out in Section 6.9.

6.4.3 Details of the assessment approach and methods for all SEA topics are outlined in Table 6.1.

**Table 6.1: Topic-specific approach and methods**

SEA Topic	Legislation / Guidance	Approach and Methods
<b>Climatic Factors</b>	<p>The Climate Change (Scotland) Act 2009</p> <p>The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019</p> <p>The Climate Change (Duties of Public Bodies: reporting Requirements) (Scotland) Order 2015</p>	<p>The assessment for effects on climate considers emissions on a global level as they contribute to the cumulative atmospheric concentrations of Greenhouse Gases (GHGs), regardless of the location they are released.</p> <p>The approach for carbon mitigation is focussed on the 2km-wide corridor area, and is based on consideration of the baseline data from the following sources:</p> <ul style="list-style-type: none"> <li>▪ Carbon and Peatland Map (Scotland's Environment Web Partnership 2021)</li> <li>▪ Climate Change trends and projections (Adaptation Scotland 2021)</li> <li>▪ Scottish Forestry</li> <li>▪ Project Mapper</li> <li>▪ SEPA Flood maps (SEPA 2020)</li> <li>▪ available information on possible route options as described in Chapter 5: Project Description;</li> <li>▪ assessment scoring criteria and SEA Guide Questions set out in this section.</li> </ul> <p>At this strategic stage of assessment, information on material quantities for construction was not available, therefore effects on climate from release of GHGs from the construction of the corridor takes a qualitative approach.</p>
<b>Air Quality</b>	<p>Scottish Air Quality Standards and Objectives</p>	<p>The assessment approach is qualitative and uses professional judgement. No air quality monitoring or modelling has been undertaken due to the early stages of design development of the project.</p> <p>The assessment utilises baseline data from the following sources:</p> <ul style="list-style-type: none"> <li>▪ Scottish Air Quality website;</li> <li>▪ Project Mapper and AddressBase data;</li> <li>▪ Automated Traffic Count (ATC) data obtained from counts undertaken by AECOM on behalf of Transport Scotland (AECOM 2020); and</li> <li>▪ Argyll and Bute Air Quality Annual Progress Report (2020), which sets out the region's compliance with Scottish Air Quality Standards and Objectives.</li> </ul>
<b>Population and Human Health</b>	<p>Scottish Transport Appraisal Guidance (STAG) (Transport Scotland 2008, updated 2015)<sup>9</sup></p> <p>DMRB LA 112 'Population and Human</p>	<p>The assessment considers the key sub-topics of human health, deprivation, social inclusion (including accessibility), rural affairs, tourism and recreation, and safety.</p> <p>The assessment has been informed by a desk-based study of publicly available sources and reports produced throughout the development of the project, including (but not limited to):</p>

<sup>9</sup> Parts of the STAG guidance have been updated, the most recent being in November 2015.

SEA Topic	Legislation / Guidance	Approach and Methods
	Health' (Highways England <i>et al</i> 2020a)	<ul style="list-style-type: none"> <li>▪ ProjectMapper and AddressBase data;</li> <li>▪ Scottish Index of Multiple Deprivation (SIMD) 2020;</li> <li>▪ National Records of Scotland and 2011 Scottish Census data;</li> <li>▪ Scientific literature in relation to human health; and</li> <li>▪ Relevant national and local development plans and strategies.</li> </ul>
<b>Material Assets</b>	<p>DMRB GG103: Introduction and general requirements for sustainable development and design (Highways England, Transport Scotland, Welsh Government, Department for Infrastructure 2019).</p> <p>SEPA (2019a). Guidance on consideration of material assets in SEA</p> <p>The Waste (Scotland) Regulations 2012</p> <p>Transport Scotland Road Asset Management Plan (RAMP) (Transport Scotland 2016</p>	<p>The SEA Directive includes Material Assets as a topic to be addressed in SEAs but does not set out a specific definition of the factors it should encompass. For the purposes of this SEA, the Material Assets topic considers the potential effect of the project on a variety of assets, as follows:</p> <p>Natural assets: watercourses, forestry and woodlands, soils, and agricultural land.</p> <p>Built Assets: infrastructure relating to energy / heat generation and distribution, waste management and transport.</p> <p>The usage of raw materials and energy is considered to take account of consumption of finite resources.</p>
<b>Biodiversity</b>	<p>Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM 2018)</p> <p>DMRB LD 118 (Highways England, Transport Scotland, Welsh Government, Department for Infrastructure 2020b)</p> <p>DMRB LA 104 (Highways England, Transport Scotland, Welsh Government, Department for Infrastructure 2020c)</p> <p>DMRB LA 108 (Highways England, Transport Scotland, Welsh Government, Department for Infrastructure 2020d)</p>	<p>A high-level desk-based assessment has been conducted to identify potential effects on designated sites, habitats and protected species as a result of the possible route options.</p> <p>The assessment has been undertaken using professional judgement in relation to the SEA objectives for Biodiversity and best practise guidance.</p> <p>The desk-based assessment was informed by information obtained from the following resources:</p> <ul style="list-style-type: none"> <li>▪ A search was conducted on NBN Atlas Scotland (NBN Atlas Partnership 2021) for species records within the Corridor between 1989 and 2019. Only records held under an Open Government Licence, Creative Commons Zero (CC0) or Creative Commons Attribution 4.0 International (CC BY 4.0) licence have been used.</li> <li>▪ NatureScot Sitelink (NatureScot 2021b).</li> <li>▪ Confidential golden eagle and freshwater pearl mussel data provided by NatureScot (data received on 06/01/2021) (NatureScot 2021c).</li> <li>▪ Scotland's Environment website (Scotland's Environment Web Partnership 2021), which includes the Scottish Natural Heritage Carbon and Peatland Map (SNH 2016) and National Vegetation Classification data (SNH 2017).</li> <li>▪ Scottish Environment Protection Agency (SEPA) website (SEPA 2021).</li> <li>▪ Ordnance Survey maps and aerial imagery.</li> </ul>

SEA Topic	Legislation / Guidance	Approach and Methods
<b>Water Environment</b>	<p>Guidance on consideration of water in Strategic Environmental Assessment (LUPS-SEA-GU3) (SEPA 2019b)</p> <p>Strategic Flood Risk Assessment: SEPA technical guidance to support development planning (SEPA 2015a)</p> <p>DMRB LA113 (Highways England <i>et al.</i> 2020e)</p>	<p>A high-level desk-based assessment has been conducted to:</p> <ul style="list-style-type: none"> <li>▪ Identify and map fluvial, surface water and coastal flood risk areas.</li> <li>▪ Identify and provide a high-level assessment of the potential flood risk constraints likely to affect / be affected by the possible route options</li> <li>▪ Identify Water Framework Directive (WFD) classified water bodies which may be affected by the possible route options, providing an indication and pressures which may affect current status</li> <li>▪ Approximate the number of minor watercourses which may be affected by the possible route options</li> <li>▪ Details on the status of any designated waters, such as bathing waters, drinking water protected areas, groundwater, nutrient sensitive areas, and water dependent areas</li> </ul> <p>This will identify any such constraints to be considered in the route corridor option analysis and provide an understanding of the key issues and potential impacts associated with the possible route options</p> <p>The outputs from the flood risk elements will detail design and assessment criteria to assist in future stages of the process (DMRB Stage 2 and 3)</p>
<b>Soils</b>	<p>Strategic Environmental Assessment SEPA Guidance Note 2 – Guidance on Consideration of soil in Strategic Environmental Assessment (SEPA 2019c)</p>	<p>The assessment approach considers the potential for significant effects relating to disturbance to carbon rich soils, in particular peat; loss of organic matter; soil sealing and soil loss; structural degradation of soils; and soil biodiversity.<sup>10</sup></p> <p>Professional judgement is used during the assessment in consideration of the baseline, available information on possible route options, the assessment scoring criteria, and the SEA objective and guide questions.</p> <p>The soils baseline was established, and the assessment undertaken utilising the following sources:</p> <ul style="list-style-type: none"> <li>▪ British Geological Survey (BGS) Geoviewer (BGS 2021);</li> <li>▪ National Soil Map of Scotland (The James Hutton Institute 2021a);</li> <li>▪ Land Capability for Agriculture (The James Hutton Institute 2010);</li> <li>▪ Land Capability for Forestry (The James Hutton Institute 2021b)</li> <li>▪ Carbon and Peatland 2016 (Scotland's Environment Web Partnership 2021); and</li> <li>▪ Other relevant soils related constraints identified using an interactive mapping tool (Project Mapper).</li> </ul>

<sup>10</sup> Soil erosion and landslide risk are considered in the DMRB Stage 1 PES Report (Jacobs/AECOM 2021 b) and soil contamination is considered only in relation to potential for contamination of soils from construction of the project.

SEA Topic	Legislation / Guidance	Approach and Methods
<b>Cultural Heritage</b>	<p>HES (2019a). Historic Environment Policy for Scotland.</p> <p>HES Managing Change in the Historic Environment guidance notes</p> <p>DMRB LA 106 Cultural Heritage Assessment</p>	<p>The SEA considers the content of the Historic Environment Policy report (HES 2019a) and its six principal policies in the cultural heritage baseline and assessment of the preferred corridor.</p> <p>The approach used for cultural heritage in the SEA comprises the following key tasks:</p> <ul style="list-style-type: none"> <li>▪ Constraints led analysis of the 2km corridor, using cultural heritage data obtained for the PES and SEA Scoping Report (HES Portal 2021)</li> <li>▪ Commentary on the potential for significant effects on cultural heritage resources (both direct and indirect) from development of the preferred corridor</li> <li>▪ Consideration of any avoidance and mitigation measures required for cultural heritage resources</li> <li>▪ As per the HES scoping response, which related to all 11 initial route corridor options (see Appendix E: Summary of Consultation Responses), consider the potential for appropriate enhancements of cultural heritage resources, once mitigation has been addressed</li> </ul>
<b>Landscape and Visual Amenity</b>	<p>Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA3) (Landscape Institute and IEM 2013)</p> <p>Fitting Landscapes: Securing more Sustainable Landscapes (Transport Scotland 2014)</p> <p>DMRB LA107 Landscape and Visual Effects (Highways England et al. 2020f)</p>	<p>A desk-based assessment was undertaken, focussing on nationally and regionally important landscapes and key visual receptors.</p> <p>The baseline was established by the study of publicly available sources, including:</p> <ul style="list-style-type: none"> <li>▪ Ordnance Survey (OS) Maps;</li> <li>▪ Scotland’s Environment website (Scotland’s Environment Web Partnership 2021);</li> <li>▪ NatureScot website and publications;</li> <li>▪ Loch Lomond and Trossachs National Park website and publications;</li> <li>▪ Land and Forestry Scotland website and publications:</li> <li>▪ Scottish Forestry Open Data;</li> <li>▪ Local authority plans and GIS data; and</li> <li>▪ Google Earth.</li> </ul> <p>The corridor was assessed against the SEA Objective for Landscape and Visual Amenity using professional judgement and best practice guidance.</p> <p>The likely significant effects of the project on the individual landscape and visual receptors within the corridor were also assessed, informed by the sensitivity of the receptors (susceptibility to change of the kind proposed combined with value of the receptor) and the magnitude of change (scale, extent, reversibility and duration).</p> <p>In addition, the five possible route options within the corridor have been assessed in more detail in relation to landscape and visual amenity, focussing on the differences between them.</p>

## 6.5 GIS Mapping

6.5.1 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 members of the ESG. ProjectMapper has been used to determine where environmental constraints were present in relation to the corridors, for both the Preliminary Assessment and for the SEA, and where there may be opportunities for enhancement.

## 6.6 SEA Non-Technical Summary

6.6.1 Under Schedule (3) of the Environmental Assessment (Scotland) Act 2005, there is a requirement to provide a Non-Technical Summary (NTS) of the information set out in the Environmental Report. A NTS has been produced which is available on the Transport Scotland website alongside this Environmental Report. The NTS sets out the key points of this Environmental Report.

## 6.7 SEA Objectives

6.7.1 The SEA has utilised a set of SEA objectives that cover each of the environmental topics scoped into the assessment, as outlined in Table 6.2. The SEA objectives were developed on a national basis for the STPR2 SEA. These objectives have been further developed for the Access to Argyll and Bute (A83) SEA following a comprehensive review of both the baseline issues and policy requirement. They also respond to feedback received from the statutory Consultation Authorities (NatureScot, SEPA and HES) and other ESG members arising from the project consultation.

Table 6.2: SEA Objectives and Guide Questions

SEA Topic	SEA Objective	SEA Assessment Guide Questions <i>'Does the Access to Argyll and Bute (A83) corridor...?'</i>
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	<ul style="list-style-type: none"> <li>▪ promote and facilitate modal shift to more sustainable transport options?</li> <li>▪ support Scotland's target for net zero greenhouse gas emissions by 2045, and a 75% reduction in emissions by 2030, to comply with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019?</li> <li>▪ protect existing and planned forestry as well as peatlands to preserve carbon sequestration land and aid climate mitigation?</li> </ul>
	Adapt the transport network to the predicted effects of climate change	<ul style="list-style-type: none"> <li>▪ help adapt the transport network to direct and indirect risks associated with climate change projections for Scotland? (e.g. temperate, rainfall, storminess and flood risk projections)</li> <li>▪ prioritise adaptation of transport infrastructure in locations that are more vulnerable to the projected impacts of climate change, including coastal and isolated locations?</li> <li>▪ maintain or improve access to and within disadvantaged areas or isolated communities at risk from climate change impacts e.g. flooding, slope instability?</li> </ul>
Air Quality	Reduce all forms of transport-related air pollution and improve air quality	<ul style="list-style-type: none"> <li>▪ encourage and facilitate the use of active travel, particularly for short journeys?</li> <li>▪ help to reduce traffic congestion?</li> <li>▪ help to limit polluting traffic growth?</li> <li>▪ reduce emissions of key air pollutants (NO<sub>x</sub>, particulates, SO<sub>2</sub>) from all forms of transport, but focusing on the most polluting vehicles and areas of known poor air quality, e.g. diesel emissions</li> </ul>

SEA Topic	SEA Objective	SEA Assessment Guide Questions <i>'Does the Access to Argyll and Bute (A83) corridor...?'</i>
		<ul style="list-style-type: none"> <li>in urban areas?</li> <li>promote green infrastructure at all spatial scales, to help remove pollutants from the air?</li> </ul>
<b>Population and Human Health</b>	Improve quality of life and human health and increase sustainable access to essential services, employment, recreation and the natural environment	<ul style="list-style-type: none"> <li>encourage sustainable access to the natural and historic environment?</li> <li>reduce and avoid community severance or other detriment to existing active travel routes, including maintaining or improving pedestrian crossings?</li> <li>ensure safe and sustainable access for all users to essential services and employment?</li> <li>increase and enhance provision of non-motorised transport, especially walking and cycling links and facilities?</li> <li>promote linking up existing or planned new communities through the active travel network?</li> <li>plan for future capacity of the active travel network, taking into account demographic or other changes?</li> <li>provide increasing transport choice that meet the needs of the population?</li> <li>allow for greater journey time reliability?</li> <li>improve accessibility to open spaces and the path network for physical recreational purposes, including core paths, long distance trails and active travel routes?</li> </ul>
	Reduce noise and vibration associated with the transport network	<ul style="list-style-type: none"> <li>reduce noise and vibration on the transport network particularly at sensitive locations?</li> </ul>
	Promote, invest in, build and maintain infrastructure to support the development of high-quality places	<ul style="list-style-type: none"> <li>support the development of places that feel safe to all users?</li> </ul>
	Improve safety on the transport network	<ul style="list-style-type: none"> <li>reduce the likelihood of transport-related road accidents and casualties?</li> </ul>
<b>Material Assets</b>	Promote and improve the sustainable use of the transport network	<ul style="list-style-type: none"> <li>support improvements to transport technology, interchanges and timetabling?</li> <li>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.</li> <li>plan for future capacity of public transport, taking demographic and other societal changes (e.g. Covid-19 impacts) into account?</li> <li>promote sustainable use and management of existing infrastructure e.g. water, heat, energy or flood protection infrastructure?</li> </ul>
	Reduce use of natural resources	<ul style="list-style-type: none"> <li>ensure transport infrastructure and innovation delivers/contributes to the circular economy?</li> <li>ensure forestry removal is avoided and potential woodland creation areas are protected wherever possible?</li> </ul>
<b>Water Environment</b>	Protect, maintain and improve the quality of water bodies,	<ul style="list-style-type: none"> <li>support and enhance the network of blue and green infrastructure?</li> </ul>



SEA Topic	SEA Objective	SEA Assessment Guide Questions <i>'Does the Access to Argyll and Bute (A83) corridor...?'</i>
	wetlands and the marine environment from any direct or indirect impacts from the project, and protect against the risk of flooding	<ul style="list-style-type: none"> <li>▪ ensure transport network resilience to climate change and flood risk?</li> <li>▪ constrain any water bodies from achievement of Good Ecological Status/Good Ecological Potential under the WFD?</li> <li>▪ increase the risk of diffuse pollution from current or increasing traffic volumes?</li> <li>▪ 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)</li> <li>▪ increase development that physically impacts on a waterbody, watercourse, the coastline or marine environment?</li> <li>▪ promote removal of artificial transport-related structures in water bodies (e.g. bridge piers, concrete slipways)?</li> <li>▪ promote natural flood management techniques?</li> <li>▪ influence the amount of vegetated and forested land-cover that helps reduce erosion risk and surface water runoff and pollution?</li> </ul>
<b>Biodiversity</b>	Protect, maintain and enhance biodiversity and ecosystem services, avoiding damage to or loss of designated and undesignated wildlife or geological sites.	<ul style="list-style-type: none"> <li>▪ 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)</li> <li>▪ 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)</li> <li>▪ maintain or upgrade transport network to remove barriers to wildlife movement?</li> <li>▪ reduce the risk of spreading invasive non-native species?</li> <li>▪ provide opportunities for habitat enhancement, habitat creation or securing positive effects for biodiversity?</li> <li>▪ align with the strategic goals of the Aichi Biodiversity Targets and 2020 outcomes for Scotland?</li> </ul>
<b>Soil</b>	Safeguard and improve soil quality in Scotland, particularly high value agricultural land and carbon-rich soil	<ul style="list-style-type: none"> <li>▪ avoid and minimise disturbance of rare soils, high-carbon (including peat) and wetland soils and productive agricultural land?</li> <li>▪ avoid indirect impacts on off-site peat and wetland soils to maintain natural processes of hydrological and ecological regimes?</li> <li>▪ avoid or minimise land take of greenfield sites?<sup>11</sup></li> <li>▪ reduce risk of soil sealing, contamination or erosion on a significant scale?</li> <li>▪ influence the amount of vegetated and forested land-cover that helps maintain slope stability and reduces erosion risk?</li> </ul>
<b>Cultural Heritage</b>	Protect and enhance (where appropriate) cultural heritage resources <sup>12</sup> and their settings.	<ul style="list-style-type: none"> <li>▪ avoid significant effects (direct or indirect) on the physical elements of cultural heritage resources, including undesignated resources?</li> <li>▪ protect key aspects of the setting of cultural heritage resources?</li> <li>▪ affect the long-term viability of any cultural heritage resources?</li> </ul>

<sup>11</sup> Avoiding development of greenfield sites will help to maintain vegetation cover, reduce erosion and landslide risk, avoid sealing, contamination and compaction and maintain ecosystem services such as pollutant filtration and greenhouse gas storage (methane, nitrous oxide, carbon dioxide). It will also protect soil organic matter, soil biodiversity and buried archaeology.

<sup>12</sup> 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.

SEA Topic	SEA Objective	SEA Assessment Guide Questions <i>'Does the Access to Argyll and Bute (A83) corridor...?'</i>
		<ul style="list-style-type: none"> <li>improve access, via sustainable travel, to cultural heritage resources?</li> </ul>
<b>Landscape and Visual Amenity</b>	Safeguard and enhance the character and diversity of the Scottish landscape, areas of valuable landscape	<ul style="list-style-type: none"> <li>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).</li> <li>avoid significant effects on designated landscapes?</li> <li>avoid significant effects on the landscape character and elements?</li> <li>protect wild land and dark skies?</li> <li>deliver sustainable and high-quality design and placemaking?</li> <li>avoid significant effects on key visual receptors?</li> <li>avoid significant effects on views from the road?</li> </ul>

## 6.8 SEA Topics and Ecosystem Services

6.8.1 As described in Section 1.8 (Related Assessments), the SEA topics have been mapped against the relevant ecosystem services listed within the Eco-metric approach (Ecosystems Knowledge Network, 2021).<sup>13</sup> Table 6.3 does not provide an exhaustive list of ecosystem services, it focuses on the services most relevant to the project and corridor 1.

**Table 6.3: SEA Topics and Ecosystem Services**

SEA Topic	SEA Objective	Ecosystem Services
<b>Climatic Factors</b>	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	<ul style="list-style-type: none"> <li>Local Climate Regulation (Cooling and Shading)</li> <li>Global Climate Regulation (Carbon Storage)</li> </ul>
	Adapt the transport network to the predicted effects of climate change	
<b>Air Quality</b>	Reduce all forms of transport-related air pollution and improve air quality	<ul style="list-style-type: none"> <li>Air Quality Regulation</li> </ul>
<b>Population and Human Health</b>	Improve quality of life and human health and increase sustainable access to essential services, employment, recreation and the natural environment	<ul style="list-style-type: none"> <li>Cooling and shading</li> <li>Interaction with Nature</li> <li>Noise Reduction</li> <li>Recreation</li> <li>Sense of Place</li> </ul>
	Reduce noise and vibration associated with the transport network	
	Promote, invest in, build and maintain infrastructure to support the development of high-quality places	

<sup>13</sup> It should be noted that the Eco-metric is subject to update in 2021.

SEA Topic	SEA Objective	Ecosystem Services
	Improve safety on the transport network	
<b>Material Assets</b>	Promote and improve the sustainable use of the transport network	n/a
	Reduce use of natural resources	<ul style="list-style-type: none"> <li>▪ Wood Production</li> </ul>
<b>Water Environment</b>	Protect, maintain and improve the quality of water bodies, wetlands and the marine environment from any direct or indirect impacts from the project, and protect against the risk of flooding	<ul style="list-style-type: none"> <li>▪ Flood Regulation</li> <li>▪ Water Supply</li> <li>▪ Water Quality Regulation</li> </ul>
<b>Biodiversity</b>	Protect, maintain and enhance biodiversity and ecosystem services, avoiding damage to or loss of designated and undesignated wildlife or geological sites.	<ul style="list-style-type: none"> <li>▪ Disease and Pest Control</li> <li>▪ Pollination</li> <li>▪ Water Quality Regulation</li> </ul>
<b>Soil</b>	Safeguard and improve soil quality in Scotland, particularly high value agricultural land and carbon-rich soil	<ul style="list-style-type: none"> <li>▪ Erosion Protection</li> <li>▪ Flood Regulation</li> </ul>
<b>Cultural Heritage</b>	Protect and enhance (where appropriate) cultural heritage resources <sup>14</sup> and their settings.	There are varying opinions across the discipline as to the degree to which the historic environment should be considered within a natural capital assessment. Consideration of cultural heritage will be included through the assessment of cultural services. In addition, engagement with Historic Environment Scotland will allow for consideration of how the historic environment contributes to the delivery of wider ecosystem services.
<b>Landscape and Visual Amenity</b>	Safeguard and enhance the character and diversity of the Scottish landscape, areas of valuable landscape	<ul style="list-style-type: none"> <li>▪ Aesthetic Value</li> <li>▪ Carbon Storage</li> <li>▪ Cooling and Shading</li> <li>▪ Disease and Pest Control</li> <li>▪ Erosion Protection</li> <li>▪ Flood Regulation</li> <li>▪ Interaction with Nature</li> <li>▪ Recreation</li> <li>▪ Sense of Place</li> <li>▪ Wood Production</li> <li>▪ Water Quality Regulation</li> <li>▪ Water Supply</li> </ul>

<sup>14</sup> 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.

## 6.9 SEA Scoring Criteria

- 6.9.1 SEA Guidance, primarily Scottish Government (2013), and the specific environmental topic guidance identified in Table 6.3 have been used in conjunction with the SEA Objectives to assess the likely significant effects associated with corridor 1.
- 6.9.2 The assessment has been summarised for each SEA topic in Appendix C (Detailed Baseline and Assessment), with a colour-coded scoring, as shown in Table 6.4. This is accompanied by a narrative that provides the rationale to the scoring. The scoring criteria have been refined throughout the SEA and PES process, for example due to scoping consultation feedback received. Due to the strategic nature of the SEA and the absence of design details at DMRB Stage 1, the assessment and narrative is necessarily high-level. Table 6.4 presents a broad summary of the SEA scoring criteria across all SEA topics collectively, but additional interpretation of the scoring in relation to each SEA topic is provided in Appendix C (Detailed Baseline and Assessment).

**Table 6.4: Assessment Scoring Criteria for Corridor 1 and its Possible Route Options**

Score	Description	Colour coding and symbol
Minor positive effect	The route corridor* has potential for positive environmental effects, for example by providing opportunities for enhancement.	+
Minor negative or uncertain effect	The route corridor* has potential for a minor negative or uncertain environmental effect.	-
Significant negative effect	The route corridor* has potential for significant negative environmental effects.	--
*Or corridor route option within it		

## 6.10 Duration of Effects

- 6.10.1 The SEA Directive requires consideration of the duration of effects, e.g. short-term, medium-term, or long-term effects. For the purposes of the SEA, these are defined in Table 6.5 and have been informed by DMRB guidance.

**Table 6.5: Duration of Effects Definitions**

Duration	Definition
Short-term	Construction phase
Medium-term	Opening year to design year (year 1 – year 15)
Long-term	Design year onwards (year 15+)

- 6.10.2 Some SEA topics may differ in their definition of effects duration, and where this is the case, this is outlined in the specific methodologies in Appendix C (Detailed Baseline and Assessment).
- 6.10.3 All estimated environmental effect durations are described as either temporary, permanent, or uncertain in the topic assessments.
- 6.10.4 All environmental effects reported in the topic assessments are reversible unless otherwise stated.

## 7. Environmental Constraints and Opportunities

### 7.1 Introduction

7.1.1 This section sets out the key environmental constraints and opportunities identified for each of the SEA topics. A detailed baseline and assessment is provided in Appendix C (Detailed Baseline and Assessment: Sections 1 -9).

### 7.2 Climatic Factors

7.2.1 The region in which the route corridor is situated is rural, and at a high elevation. Due to the topography of the route corridor, the existing A83 is regularly affected by landslides during periods of extended rainfall, which causes slope instability.

7.2.2 The region has shown a consistent upward trend in annual rainfall since 1970, with the rainfall anomaly also showing a gradual increase each year over the past 20 years. This aligns with the long-term climate change projections for Scotland, which indicate winters will be wetter and heavy rainfall events will increase in frequency in all seasons. The region has also experienced a consistent upward trend in mean temperature since 1970. Scotland's ten warmest years have all occurred since 1997, since records began in 1884.

7.2.3 The route corridor contains land-uses which have high carbon sequestration and sink value. This includes forestry, peat soils and grassland. These habitats are all important for carbon sequestration and climate change mitigation.

7.2.4 There is potential for the project to have **permanent, minor negative or uncertain effects** on climate during construction and operation. These come from disturbance and loss of peat and forestry land within the route corridor, resulting in a loss of high value carbon sequestration land. There is also potential for **permanent, minor positive effects** on climate through adapting the road network to be more resilient to the future impacts of climate change.

7.2.5 Once operational, emissions from vehicles using the project would add to the cumulative atmospheric concentration of carbon dioxide (CO<sub>2</sub>). The scale of the emissions would be dependent on traffic flows and type of vehicle using the route. The UK Government has committed to banning the sale of new fossil fuel vehicles from 2030 and phasing out hybrid vehicles by 2035. The Scottish Government has committed to phasing out non-hybrid petrol and diesel cars by 2032. This would be expected to lead to a gradual decline in user emissions as the national vehicle fleet updates and fewer fossil fuel cars are in operation.

7.2.6 In relation to the Climatic Factors SEA objective to *'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,'* the purpose of the project is to improve resilience as opposed to increasing capacity. Materials required to construct the project would have an embodied carbon content and emissions would be released during construction. The project could also result in unavoidable loss of existing and planned forestry as well as peat lands, which would not support the sub-objective to protect forestry and peatlands. In relation to the SEA objective to *'Adapt the transport network to the anticipated effects of climate change,'* the project would support this objective, by providing more resilient infrastructure and improving mobility in the region.

- 7.2.7 Overall, a **minor positive effect and minor negative or uncertain effects** are anticipated on Climatic Factors at SEA level from the project. The effects on climate as a result of emissions associated with the project are considered **long-term and permanent**. The duration of effects from loss of carbon sequestration land are uncertain at this stage. Further assessment of potential climate effects and development of mitigation would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

**Key Findings:**

Loss of forestry and peat lands during construction and operation has the potential for **permanent, minor negative or uncertain effects** on Climatic Factors. Manufacture of materials and construction activities would release emissions which would add to the atmospheric concentration of greenhouse gases. Mitigation could be successful in carbon off-setting but this would be considered in further assessment.

Construction of the project would improve the resilience of the A83 to the anticipated impacts of climate change and reduce the need for closures during adverse weather, resulting in **long-term, minor positive effects** during operation.

### 7.3 Air Quality

- 7.3.1 The ambient air quality environment within the route corridor is rural in nature, with no population centres in the vicinity. There are 14 receptors, and of these only two residential receptors, present within the route corridor that could be sensitive to changes in air quality.
- 7.3.2 Argyll and Bute's 2020 Air Quality Annual Progress Report (APR) set out that air quality in the region is considered to be generally very good. There are no Air Quality Management Areas currently in the region.
- 7.3.3 Traffic on the A83 could reasonably be considered the primary source of emissions to air along the route corridor. At the Rest and Be Thankful, A83 Trunk Road traffic volumes were approximately 4,500 vehicles per day in 2019, with the HGV percentage around 9%, suggesting that, on average, around 400 HGVs pass through Glen Croe on a daily basis. Additionally, around 17% of average daily traffic in 2019, on the A83 within Glen Croe (approximately 800 vehicles) was a light goods vehicle. Approximately 100 buses and coaches per day passed through Glen Croe via the A83 Trunk Road, in 2019.
- 7.3.4 There is potential for the project to have a **short-term, minor negative or uncertain effect** on air quality in the local area during the construction phase. However, there are very few sensitive air quality receptors in the route corridor and it is expected that any negative effects that may arise would be largely mitigatable through construction environmental management planning and best practice.
- 7.3.5 In relation to the overarching Air Quality SEA Objective to '*Reduce all forms of transport-related air pollution and improve air quality*', during operation the project would not inherently reduce all forms of transport-related air pollution and improve air quality. However, air quality in the Argyll and Bute region is already very good and it is considered it is likely that the current conditions would be maintained with the project in place.

- 7.3.6 Given the enhanced connectivity and resilience provided by the improvement, it is not unreasonable to assume an increase in traffic volumes, primarily relating to summer tourism and enhanced business confidence, could follow, albeit at a relatively low level. Opportunities exist to provide green infrastructure to enhance air quality as part of the project. Any negative impacts related to transport-based emissions and air quality (resulting from induced demand) are expected to be short-term and unlikely to be significant.
- 7.3.7 Overall, a **minor negative or uncertain effect** is anticipated for air quality at SEA level from the project. The duration of potential operational effects is unknown at this stage. Further assessment of potential air quality effects and identification of appropriate mitigation measures for construction and operation of the project would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

#### Key Findings:

There is potential for a future increase in traffic volumes during operation of the project, as a result of improved connectivity and resilience, though this is unlikely to have a significant effect on air quality in the corridor and in the Argyll and Bute region as a whole.

There are opportunities for improvements to green infrastructure as a result of the project, though any effects this would have on air quality would be unlikely to be significant.

There is potential for **short-term, minor negative** air quality effects during construction where works occur in close proximity to sensitive receptors. However, these effects would be largely mitigated through construction best practice. During operation a **minor negative or uncertain effect** is anticipated.

## 7.4 Population and Human Health

- 7.4.1 The proposed route corridor is rural in nature, with no population centres located within it or within its immediate vicinity. There are 14 receptors located in the route corridor which could potentially be impacted by the project, including two residential properties.
- 7.4.2 Due to its rural location, the route corridor has been identified to be within the 10% most deprived areas in Scotland in terms of access to key services and amenities such as GP surgeries, schools, post offices and retail centres. Consequently, people living within the route corridor have limited opportunities to fully participate in society, which can lead to a range of inequalities, including health and employment. Currently, accidents or incidents (e.g. roadworks, landslips, flooding) occurring on any part of the A83 in Argyll and Bute can effectively cut off parts of the region for a period, further impacting residents, business and visitors due to the significant length of alternative routes and the travel times involved.
- 7.4.3 The general health of those living within the route corridor and the surrounding area is comparable to the general health of the populations of both Scotland and the Argyll and Bute region, with most people experiencing very good, good or fair health. Argyll and Bute has an ageing population. The percentage of people over the age of 65 (and therefore more vulnerable to potential effects on human health) living within the route corridor and the surrounding area is also comparable to the national average.



- 7.4.4 There is potential that the project could result in **short-term, minor negative or uncertain effects** on air quality and noise and vibration for local residents resulting from traffic and activities associated with construction works. **Short-term negative effects** on access to non-motorised user (NMU) facilities and the amenity of these facilities within the route corridor could also result from increases in noise levels, dust and emissions and temporary changes to views during the construction phase. However, through the implementation of best practice methods, it is not anticipated that these effects would be significant.
- 7.4.5 In relation to the Population and Human Health SEA Objective to '*Improve quality of life and human and health and increase sustainable access to essential services, employment and the natural environment*', during operation the project could provide potential opportunities for the provision of enhanced NMU facilities and linkages to walking and cycling routes and core paths. By improving the resilience of the A83 and thereby public transport reliability, the project is also expected to indirectly support more reliable and frequent public transport services and more reliable journey times to employment opportunities, recreation, education and health services both within and outwith the region.
- 7.4.6 In relation to the SEA Objective to '*Promote, invest in, build and maintain infrastructure to support the development of high-quality places*', the project could result in increased business confidence and associated inward investment within the wider Argyll and Bute region due to the enhanced resilience provided through mitigating landslide related closures of the road network.
- 7.4.7 In relation to the SEA Objective to '*Improve safety on the transport network*', minor reductions in transport-related casualties could potentially be realised as a result of fewer road closures and associated long diversion routes. Therefore, it is anticipated that the project would result in a minor positive contribution towards the Scottish Government's Vision Zero road safety target of zero fatalities and injuries of Scotland's roads by 2050.
- 7.4.8 Overall, a **minor positive effect and minor negative or uncertain effects** are anticipated on Population and Human Health at SEA level from the project. Further assessment of potential population and human health effects and identification of appropriate mitigation measures for construction and operation of the project would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

#### Key Findings:

During construction, there is potential for short-term, minor negative or uncertain effects on air quality and noise and vibration for local residents resulting from construction activities and traffic. Short-term negative effects on access to and the amenity of NMU facilities within the corridor could also result from increased noise levels, dust and temporary changes to views. However, mitigation is anticipated to reduce these effects to become non-significant.

There is potential for a slight increase in traffic levels during operation of the project, which could result in an increase in noise and vibration and air quality effects at a localised level.

It is expected that the project would generally improve quality of life and increase sustainable access to essential services, employment and the nature through improving the resilience of the A83, more reliable and frequent public transport services, and the provision of enhanced NMU and parking facilities, including linkages to walking and cycling routes and core paths.

It is anticipated that the corridor would generally improve connectivity between the central belt and Argyll and Bute, and provide greater accessibility to active travel routes.

During operation a **permanent, minor positive effect** is anticipated on population and human health.

## 7.5 Material Assets

- 7.5.1 The environment in which the route corridor is situated is rural, and at a high elevation. Natural material assets within the route corridor include existing woodland and forestry strategy areas identified for future planting. There are peatlands within the route corridor and three classifications of agricultural land. The route corridor will be influenced by the Rest and Be Thankful Woodland Creation Project, which proposes a mixed native woodland plantation to help stabilise the slopes.
- 7.5.2 The key built material assets relate to road infrastructure of the existing A83 and B828. There is a public car park at the highpoint of the Rest and be Thankful viewpoint where the B828 meets the A83. There are no other built material assets within the route corridor.
- 7.5.3 There is potential for the project to have **permanent, minor negative or uncertain effects** on natural material assets during construction and operation. These come from disturbance and loss of peat, forestry land and other natural habitat within the route corridor, resulting in a loss of high value carbon sequestration land. There is also potential for **permanent, minor positive effects** on built material assets through adapting the road network to the future impacts of climate change.
- 7.5.4 In relation to the Material Assets SEA objective to *'Promote and improve the sustainable use of the transport network,'* the project will provide upgraded infrastructure within a rural region and a more resilient route, reducing the need for lengthy diversionary routes during weather closures, improving the reliability of public transport of the route.
- 7.5.5 In relation to the SEA Objective to *'Reduce use of natural resources,'* construction of the project would consume finite resources and energy during construction for the manufacture of materials and construction activities, as well as generating waste. The project could result in unavoidable loss of existing forestry as well as affect planned forestry within the LLTNPA Woodland Strategy, which would not support the sub-objective to protect woodland.
- 7.5.6 Overall, a **minor positive effect and minor negative or uncertain effects** are anticipated on Material Assets at SEA level from the project. This recognises the consumption of materials to construct the project, generation of waste and loss of forestry and peat soils within the route corridor. However, the project will provide more resilient infrastructure, improving the operational reliability of the A83. Further assessment of potential effects on Material Assets and development of mitigation would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

### Key Findings:

Loss of forestry and peat during construction and operation has the potential for **permanent, long-term, minor negative or uncertain effects** on natural material assets. Land-use within the corridor would change as a result of the project. The scale of these effects would be determined by the footprint of the project and the success of mitigation.

Construction of the project would consume energy and finite resources, as well as generate demolition and construction waste, resulting in **long-term, minor negative or uncertain effects** on built material assets.

Provision of resilient infrastructure would positively contribute towards adapting the road network to climate change impacts, resulting in a **permanent, minor positive effect** on built material assets.

## 7.6 Biodiversity

- 7.6.1 The route corridor falls within or adjacent to statutory designated sites of international and national importance for their conservation value. It is located 0.06km south of Glen Etive and Glen Fyne SPA, which is designated for breeding golden eagle. Beinn an Lochain SSSI falls within the route corridor (209.40ha), which is designated for siliceous scree (including boulder fields), tall herb ledge, and upland assemblage. Most of the route corridor falls within the LLTNP.
- 7.6.2 The route corridor includes habitats that provide biodiversity value and could support species of conservation interest. Whilst, there are no parcels of AWI within the route corridor, four of the six habitat parcels listed on the Native Woodland Survey of Scotland (NWSS) are native woodland and coniferous plantation woodland also covers large areas of the route corridor. Other terrestrial habitats identified include: two areas of Class 1 peat habitat, mire habitats (M6 and M25, which can be indicative of Groundwater Dependent Terrestrial Ecosystems - GWDTEs), and calcifugous grassland and montane communities (U4, U5, and U20). Loch Restil, Kinglas Water Croe Water, and approximately 30 to 40 minor unnamed watercourses were identified as freshwater features. There are records of seven bird species and four mammal species of conservation interest.
- 7.6.3 There is potential for the project to result in **medium-term and long-term significant negative effects** on designated sites during construction and operation. Effects on designated sites could result from disturbance (of golden eagle, a designated feature of Glen Etive and Glen Fyne SPA), generation of dust and airborne pollutants from construction activities (on Beinn an Lochain SSSI), and as a result of temporary and permanent loss or alteration of habitat (to Beinn an Lochain SSSI and LLTNP). Construction best practice methods should be adhered to and additional mitigation methods could be implemented to reduce disturbance. Should the project require the loss of habitat from an internationally or nationally designated site, bespoke mitigation or compensation could be required. The specific details would be prepared at DMRB Stage 3.
- 7.6.4 The project could have **short-term and medium-term minor negative or uncertain effects** on acid grassland, aquatic habitats and GWDTEs during construction. **Long-term significant negative effects** on native woodland, plantation woodland and peat habitats could occur during construction. During operation, the project could result in **long-term minor negative or uncertain effects** on acid grassland, aquatic habitats and plantation woodland. **Long-term significant negative effects** on GWDTEs, native woodland and peat habitats could occur during operation. These effects would be the result of loss or alteration of habitats during construction and operation. The design of the project should seek to minimise overall land-take to reduce negative effects on biodiversity. The loss of woodland and other notable habitats should be replaced through tailored planting mitigation to ensure contiguousness of woodland.
- 7.6.5 During construction, the project could have **short-term and long-term minor negative or uncertain effects** on species of conservation interest. These effects could result from construction related activities, including vehicle movement, noise, vibration and light spill, and temporary loss of habitat. A Construction Environmental Management Plan (CEMP) should be developed as part of the construction phase documentation, which should include a Biosecurity Plan, an Ecological Management Plan and Species Management Plans as required. Construction activities close to sensitive receptors should be scheduled to reduce disturbance to species of conservation interest (e.g. seasonal restrictions or avoidance of works during the hours of darkness) and construction best practice methods should be adhered to.
- 7.6.6 During operation, **long-term significant negative effects** as a result of permanent loss of habitat under the footprint of the project and increased wildlife collisions with vehicles could occur to badger, black grouse, pine marten, red squirrel, and mountain hare. Breeding birds could experience a **long-term minor negative or uncertain effect** due to the loss of suitable breeding habitat under the footprint of the project. The project should seek to minimise overall land-take and ensure permeability for wildlife.

- 7.6.7 The principle of securing positive effects for biodiversity should be adopted throughout the project lifecycle to ensure that functional ecosystems are maintained and compliance with government policy and DMRB guidance.
- 7.6.8 It is considered that the route corridor does not currently meet the Biodiversity SEA objective to '*Protect, maintain and enhance biodiversity and ecosystem services, avoiding damage to or loss of designated and undesignated wildlife or geological sites.*' The construction and operation of new infrastructure would not inherently meet this objective, and at this stage it is not possible to determine whether the extent to which potential negative effects could be mitigated. Securing positive effects for biodiversity should be a key consideration throughout the design development.
- 7.6.9 Overall, there is potential for **minor negative or uncertain effects, or significant negative effects** on biodiversity at SEA level from the project. It is considered likely that negative effects on biodiversity would reduce throughout the iterative design process and there may be opportunities for improvements to biodiversity. Further assessment of potential effects to biodiversity and identification of appropriate mitigation measures for construction and operation of the project would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

#### Key Findings:

There is potential for **significant negative effects** on designated sites during construction, as a result of disturbance and generation of dust and airborne pollutants from construction activities. Negative effects as a result of habitat loss or alteration during construction and operation could also occur. Refinement of the project design and implementation of appropriate mitigation could reduce these effects, but it is not possible to determine whether all negative effects can be mitigated.

There is potential for **minor negative and significant negative effects** on habitats and species of conservation interest as a result of habitat loss or alteration during construction and operation of the project. Refinement of the project design and implementation of appropriate mitigation could reduce these effects, but it is not possible to determine whether all negative effects can be mitigated. **Minor negative and significant negative effects** as a result of construction activities are expected to be reduced through implementation of best practice construction methods and typical mitigation methods.

There may be opportunities for improving biodiversity in the long-term, with adoption of the principle of securing positive effects for biodiversity throughout the project lifecycle to ensure compliance with government policy and DMRB guidance. The project should seek to minimise overall land-take as far as practicable, and ensure permeability for wildlife.

## 7.7 Water Environment

- 7.7.1 The route corridor falls within the catchment of two watercourses which are monitored by SEPA under the Water Framework Directive (WFD) (referred to by SEPA as baseline water bodies); Croe Water and Kinglas Water. Croe Water drains into Loch Long, which is downstream of the route corridor. Loch Long is subdivided into two WFD coastal water bodies: Long Long (North) and Loch Long (South), and it is Loch Long (North) which has the potential to be affected by the project. Based on a review of OS mapping, there are approximately 30 to 40 minor unnamed watercourses within the route corridor. These are tributaries of Croe Water and Kinglas Water.
- 7.7.2 There are two groundwater bodies which are monitored by SEPA under the WFD within the route corridor; Cowal and Lomond and Oban and Kintyre. Cowal and Lomond, is present within the southern extent of the route corridor, south of Loch Restil, and Oban and Kintyre to the north. The underlying geology suggests a low productivity bedrock aquifer belonging to the Southern Highland Group. This aquifer is described as having small amounts of groundwater in near surface weathered zones and within secondary fractures (BGS 2021).
- 7.7.3 SEPA Flood Maps (SEPA 2020) indicate areas of the existing A83 and Old Military Road may be at risk from fluvial flooding from the Croe Water and pluvial flooding for the 0.5% Annual Exceedance Probability (AEP) (200-year) (Medium) flood event, predominantly within the southern extents of the route corridor. The route corridor is over 3km from the nearest coastal waterbody, Loch Long, and is therefore not at risk of coastal flooding. BGS Groundwater Flood Mapping (BGS 2020), indicate much of the route corridor, in particular within the Glen Croe Valley has '*potential for groundwater flooding to occur at surface*'.
- 7.7.4 A review of protected waters within the route corridor established the corridor passes through the Croe Water Drinking Water Protected Area, from the southern-most extent of the route corridor up to Loch Restil. However, there are no Bathing Waters, Shellfish Water Protected Areas, Active Aquaculture Sites, Controlled Activities Regulations (CAR) licenced fish farms or Classified Shellfish Harvesting Areas within the route corridor. However, Loch Long, which is located downstream of the proposed route corridor is within a Shellfish Water Protected Area. The designations and regulations that require them are described in Appendix C (Section 6: Water Environment). There are also no designated sites (such as SSSIs, SPAs or SACs) protected for water environment interests within the route corridor.
- 7.7.5 There is potential for the project to result in **short term, minor negative or uncertain effects** during construction and **long-term, minor negative or uncertain effects** during operation on the water quality of surface water and groundwater bodies. Effects on water quality may result from inputs of contaminants or sediment into water bodies, such as from run-off, accidental spillages, tree felling or disturbance to existing pollutant pathways. However, it is expected that any negative effects from both construction and operation would be largely mitigatable through the implementation of appropriate pollution control measures. Potential opportunities also exist to improve surface water quality during operation through upgrades to drainage systems, in line with current standards, including Sustainable Drainage Systems (SuDS) provision.
- 7.7.6 The project may have **long-term, significant negative effects** on the hydromorphology of surface watercourses during construction and operation, predominantly through in-channel structures or channel realignments. Any effects during construction are likely to be temporary in nature, however there is potential for permanent effects during operation. Dependent on the design development of the project, implementation of best practice is anticipated to avoid or reduce negative effects on hydromorphology, however at this stage it is not possible to determine whether all negative effects can be mitigated. Opportunities may exist to improve watercourse hydromorphology, for example where watercourses have existing modifications.

- 7.7.7 The project also has the potential to have **short-term and/ or long-term, significant negative effects** on groundwater flows and levels, through dewatering during construction, effects potentially extending into operation alongside the implementation of sub-surface structures during operation. Potential effects on groundwater will be anticipated to be localised in nature, however sensitive receptors such as GWDTEs have the potential to be significantly affected. The design of the project may be able to mitigate these potential effects, although this will be dependent on existing groundwater levels.
- 7.7.8 Finally, there is also potential for the project to have **long-term, minor negative or uncertain effects** on fluvial, pluvial, and groundwater flood risk by creating increased risk of flooding to flood risk receptors within the route corridor, in addition to potential for flooding risk to the construction site or carriageway during operation. Effects from flooding would be expected to be mitigated through the implementation of best practice during the design stages of the project and the implementation of compensatory flood storage areas, if required. Opportunities may exist to reduce the likelihood of fluvial flood risk through upgrading watercourse crossings with insufficient capacity in line with current design standards.
- 7.7.9 In relation to the overarching Water Environment SEA Objective to *'Protect, maintain and improve the quality of water bodies, wetlands and the marine environment from any direct or indirect impacts from the project, and protect against the risk of flooding'*, during operation the project would not inherently protect, maintain or improve the quality of the water environment. However, the quality of water bodies would be anticipated to be protected and maintained through the implementation of appropriate best practice and mitigation. In addition, dependent on the design of the project, there is the potential for opportunities to improve the quality of water bodies.
- 7.7.10 Overall, there is potential for **minor negative or uncertain or significant negative effects** of the project on the water environment. However, it is anticipated any potential significant negative effects could be mitigated at further design stages and there may be opportunities for improvements to the water environment, resulting in a minor positive effect, dependent on project design. Further assessment of potential or uncertain effects on the water environment and identification of appropriate mitigation measures for construction and operation of the project would be outlined at DMRB Stages 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment). It is expected that subsequent stages would utilise site investigation and flood modelling within the assessments to reduce the uncertainties around the significance of effects outlined at SEA stage.

### Key Findings:

There is potential for **minor negative or uncertain effects** on surface water bodies during construction and operation of the project, due to changes in water quality.. The project may have **long-term, significant negative effects** on the hydromorphology of surface watercourses during construction and operation and on surface water quality during operation. At this stage it is not possible to determine whether all negative effects on hydromorphology can be mitigated.

There is potential for **minor negative or uncertain effects** groundwater bodies during construction and operation of the project due to potential changes in groundwater quality, flows or levels. These effects would generally be localised and temporary during construction, however there is potential for longer term effects during operation, dependent on the design of the project. Effects on groundwater bodies are dependent on existing groundwater levels. Overall, there is potential for **short-term and/ or long-term, significant negative effects** on groundwater flows and levels.

There is potential for the project to have **minor negative or uncertain effects** on flood risk to existing receptors ,the construction site, and operational carriageway.. It is anticipated any negative effects would be addressed through appropriate design and/or mitigation and are unlikely to be significant. Overall, there is potential for **minor negative or uncertain or significant negative effects** of the project on the water environment.

Opportunities may exist to improve water quality in surface water and groundwater bodies, through upgrading existing drainage networks in line with current standards. There may also be opportunities to improve channel hydromorphology where watercourses have existing modifications and reduce the likelihood of fluvial flooding through upgrading watercourse crossings to improve conveyance.

## 7.8 Soils

- 7.8.1 The majority of the bedrock within the route corridor is metamorphic, with some igneous formations to the east of the A83 between the Cobbler and Beinn Luibhean (BGS 2021). The superficial geology within the study area is predominantly till with some sedimentary river deposits located along Croe Water (BGS 2021). The Cobbler (Beinn Artair, or Ben Arthur) Geological Conservation Review (GCR) site, which is associated with mass movements, is located on the higher slopes of The Cobbler which falls partly within the south-eastern extent of the route corridor and approximately 820m from the existing A83 (NatureScot 2021d).
- 7.8.2 The majority of soil within the route corridor can be characterised as peaty gleyed podzols with peaty gleys and dystrophic semi-confined peat with Strichen soil association (The James Hutton Institute 2021a). The soils are adjacent to the existing A83 Trunk Road and on either side of Glen Croe valley.
- 7.8.3 The majority of the route corridor transects land identified on the Carbon and Peatland 2016 Map (Scottish Natural Heritage 2016) as Class 3 (not priority peatland habitat with carbon-rich soils and some areas of deep peat), Class 4 (area unlikely to be associated with peatland or high carbon soils) and Class 5 (no peatland habitat recorded, soils are carbon-rich and deep peat). A small area of peat identified as Class 1 (nationally important carbon-rich soils, deep peat and priority peatland habitat, areas likely to be of high conservation value) has been identified in the route corridor on the higher slopes of Ben Donich to the west and where the A83 joins Glen Kinglas to the north.
- 7.8.4 The majority of agricultural land and forestry within the route corridor is classified as Land Capability for Agriculture (LCA) Class 6.2 (non-prime land capable of use as rough grazings with moderate quality plants) and Land Classification for Forestry (LCF) Class F6 (Land with very limited flexibility for the growth and management of tree crop).
- 7.8.5 The project is assessed as having the potential for **irreversible, minor negative or uncertain effect** on geology. This recognises the loss of and disturbance to superficial geology by all possible route options and disturbance of bedrock geology with the Purple Route Option and the Pink Route Option due to the incorporation of tunnels in the design. However, it is acknowledged that this would be a minor overall percentage loss of the geological occurrence within the region and country. All possible route options are likely to avoid The Cobbler Beinn Artair) GCR site.
- 7.8.6 The project is assessed as having **reversible and irreversible, minor negative or uncertain effect** on soils. This recognises the potentially irreversible effects of soil sealing associated with a new road and/or road widening and reversible medium-term disturbance of soils leading to the potential for loss of organic matter, soil biodiversity contamination, compaction and structural degradation associated with construction of road infrastructure. In general, the shortest online option within the route corridor would be expected to have the least impact on soils. However, the inclusion of tunnels and/or viaducts within all five possible route options within the route corridor has the potential to further reduce the irreversible soil sealing and reversible medium-term disturbance impacts on soils.
- 7.8.7 The project is assessed as having **reversible and irreversible, minor negative or uncertain effect** on non-priority peatland (Class 3, Class 4, and Class 5, as categorised by Scottish Natural Heritage 2016) associated with irreversible soil sealing and reversible medium-term disturbance (potential for loss of organic matter, soil biodiversity, contamination, compaction and structural degradation). All of the possible route options, with the exception of the Green Route Option, predominantly intersect Class 3 peat. All five possible route options include the use of tunnels and/or viaducts which have the potential to further reduce irreversible soil sealing and reversible medium-term disturbance of non-priority peat. The project also has the potential to cause indirect effects on peat such as a change in drainage or change in vegetation cover. Due to the priority peat being located on the northern and western peripheries of the route corridor, it is considered unlikely that any priority peatland would be affected by the possible route options.



- 7.8.8 The project is assessed as having reversible and irreversible, **minor negative or uncertain effect** on agriculture and forestry. This recognises the irreversible sealing of and reversible medium-term disturbance to land capable of use for agriculture and forestry, and that within the route corridor there is no prime agricultural land nor land with a higher forestry classification than LCF 4 (moderate flexibility for the growth and management of tree crops).
- 7.8.9 Due to the potential effects relating to irreversible soil sealing and reversible medium-term disturbance of peat and carbon-rich soils it is considered that the project only partially meets the SEA objective of *'Safeguard and improve soil quality in Scotland, particularly high value agricultural land and carbon-rich soil'*.
- 7.8.10 Opportunities to reduce the potential effects on soils include design considerations which seek to reduce overall land-take of soils and peat, limit excavations and disturbance to geology, and avoid areas of nationally important peat and sites designated for geological interest. Where soils and peat are reversibly disturbed, mitigation should be considered to reduce the potential effect. It is recommended that opportunities for peat habitat restoration, enhancement and creation should be explored and detailed within a Peat Management Plan.
- 7.8.11 Taking the above into consideration, and with the application of mitigation, at this stage of the assessment the project is assessed as having an overall **reversible and irreversible minor negative or uncertain effect** on soils. Further assessment of the potential effects on soils and development of appropriate mitigation measures where possible to reduce the potential construction and operation effects of the project would be considered at DMRB Stage 2 (route options appraisal) and DMRB Stage 3 (preferred option design and Environmental Impact Assessment).

#### Key Findings:

There is potential for the project to result in **reversible and irreversible, minor negative or uncertain effects** on soils. This recognises the potential irreversible loss and disturbance of superficial and bedrock geology and the potential irreversible sealing of and reversible medium-term disturbance (loss of organic matter, change in soil biodiversity, contamination, compaction and structural degradation) to soils (including carbon-rich soils), peat, land capable of use for agriculture and land capable of use for forestry.

Mitigation and enhancement opportunities have been identified that have the potential to reduce effects on soils. These include reducing irreversible soil sealing through design development, reducing reversible disturbance of peat and carbon-rich soils through development of a Peat Management Plan, and considering opportunities for peatland habitat restoration and enhancement.

## 7.9 Cultural Heritage

- 7.9.1 No Scheduled Monuments, Conservation Areas, Inventory Garden and Designed Landscapes or battlefields recorded in the Inventory of Historic Battlefields have been identified within corridor 1.
- 7.9.2 One Listed Building has been identified within corridor 1. This is the Glen Croe, 'Rest and be Thankful' Stone (LB11816; a Category C Listed Building), a memorial stone at the summit of Glen Croe located within the Rest and Be Thankful car park.
- 7.9.3 In relation to the cultural heritage SEA objective '*Protect and enhance (where appropriate) cultural heritage resources and their settings*', the project is predicted to lead to **permanent minor negative or uncertain effects**.
- 7.9.4 Direct physical impacts on the Glen Croe, 'Rest and be Thankful' Stone (LB11816), a Category C Listed Building, during construction of the five possible route options are unlikely. However, there is potential for construction of all five route corridor options to alter the setting of the 'Rest and be Thankful' Stone during construction, including construction activities associated with the Rest and be Thankful car park. There will also be a potential change to its setting during operation, due to the presence of new infrastructure. It is unlikely that these changes would result in a significant effect. **Minor negative or uncertain effects** on cultural heritage were predicted for the project overall.
- 7.9.5 No opportunities have been identified in relation to the cultural heritage resources of corridor 1. However, the baseline data and assessment of cultural heritage at DMRB Stages 2 and 3 will need to consider designated and undesignated cultural heritage resources, including the undesignated Old Military Road. Mitigation recommendations for cultural heritage are provided in Section 9.2 (Key Recommendations).

### Key Findings:

No positive or significant negative effects on cultural heritage have been predicted as a result of the construction and operation of any of the possible route options. **Minor negative or uncertain effects** on cultural heritage were predicted.

There is potential for construction of all five possible route options to alter the setting of the 'Rest and be Thankful' Stone during construction, including construction activities associated with the Rest and be Thankful car park. There will also be a potential change to its setting during operation, due to the presence of new infrastructure. The magnitude of this effect during operation will vary according to the possible route option chosen and the design of that route option, but it is unlikely that these changes would result in a significant effect.

The offline Green, Purple and Yellow Route Options may require more new land-take. They would therefore have a higher potential to impact on cultural heritage, in comparison to the the Pink Route Option, which is largely proposed to be within a tunnel, or the online Brown Route Option.

## 7.10 Landscape and Visual

- 7.10.1 The route corridor is located in Glen Croe and the dramatic Rest and Be Thankful mountain pass, a major route through the mountain ranges between Loch Long and Long Fyne and one of historical and cultural significance. The majority of the route corridor is located within the Loch Lomond and Trossachs National Park (LLTNP) with three areas of 'core wildness' identified around the 'Arrochar Alps' summits of The Cobbler and Beinn Luibhean. The remaining part of the route corridor is located in the North Argyll Area of Panoramic Quality (APQ).
- 7.10.2 The route corridor is located within the Upland Glens - Loch Lomond & the Trossachs Landscape Character Type (LCT) 252, Highland Summits LCT 251 and Steep Ridges and Mountains LCT 34. There is one larger freshwater loch, Loch Restil, and a large number of watercourses in the route corridor. There are several small pockets of native broadleaved woodland along the valley floor and a larger block of young native pinewood near Butterbridge. The remaining woodland cover within the route corridor comprises large areas of coniferous forestry plantation with additional native woodland planting planned on the western slopes of Beinn Luibhean.
- 7.10.3 Key visual receptors within or in the immediate vicinity of the route corridor comprise:
- isolated residential receptors;
  - two LLTNP core paths;
  - the LLTNP viewpoints at Rest and Be Thankful car park;
  - Butterbridge (Glen Kinglas) viewpoint;
  - Gleann Mor (B828) viewpoint;
  - hill walking trails to the summits of three nearby Corbetts (Ben Donich, Beinn Luibhean and Beinn an Lochain);
  - Argyll Coastal Route (along the A83); and
  - Old Military Road.
- 7.10.4 The effects of construction of the project on the landscape and visual receptors are likely to be temporary and short to medium term, although they may still be significant, depending on the route alignment and structures. As details of construction would only be known once the alignment is chosen, the SEA landscape and visual assessment focussed on the effects resulting from the operation of the project.
- 7.10.5 In relation to the Landscape and Visual Amenity SEA Objective to '*Safeguard and enhance the character and diversity of the Scottish landscape, areas of valuable landscape*', the project could result in **significant negative effects** on the designated high-value landscape of the LLTNP as well as local landscape character, landscape elements and key visual receptors. However, design and landscape mitigation would be developed through DMRB Stages 2 and 3, and the project could also provide opportunities for delivering high-quality design and placemaking.

- 7.10.6 There is potential for direct **significant negative effects** on the Special Landscape Qualities of the LLTNP (such as the dramatic pass of Rest and Be Thankful) and the Upland Glens - Loch Lomond & the Trossachs LCT 252 as a result of the project. Potential direct or indirect **significant negative effects** are also likely on Highland Summits LCT 251 and the landscape elements and features such as Loch Restil, woodland, forestry and distinct landform. Potential indirect **significant negative effects** are anticipated on the LLTNP Core Wildness areas on the upper western slopes of The Cobbler and Beinn Luibhean. The project is also likely to result in **minor negative or uncertain effects** on the Steep Ridges and Mountains LCT 34, the North Argyll APQ and the LLTNP Viewpoints at Butterbridge and in Gleann Mor.
- 7.10.7 There is potential for **significant negative effects** on the residential receptors within the route corridor, on the viewpoint at Rest and Be Thankful car park, on the Ben Donich, Beinn Luibhean and Beinn an Lochain hill walking trails, the LLTNP core paths and the Old Military Road. The magnitude of change would depend on the possible route option selected and design of structures; however, it is not likely that these effects could be fully avoided. There is also potential for **either negative or positive effects** on the experience of the people travelling along the Argyll Coastal Route, depending on the possible route option selected and design of structures.
- 7.10.8 Overall, there is potential for **significant negative effects** on landscape and visual amenity at SEA level from the project. All of these effects are likely to be **long-term, permanent and irreversible**. Some of the likely negative effects may reduce throughout the iterative design process by embedding landscape mitigation in the design where possible, including through careful route selection and project design, minimising woodland loss, input into the design of structures and earthworks and through landscape mitigation proposals that tie in with the surrounding landscape.
- 7.10.9 Further assessment of potential effects on landscape and visual amenity and identification of appropriate mitigation measures for construction and operation of the project would be outlined at DMRB Stages 2 and 3.

#### Key Findings:

There is potential for **significant negative** effects on the Special Landscape Qualities of the LLTNP, the LLTNP core wildness areas around the summits of The Cobbler and Beinn Luibhean, the Upland Glens and Highland Summits LCTs and local landscape elements and features such as Loch Restil, woodland, forestry and distinct landform.

There is also potential for **significant negative effects** on residential receptors, the Rest and Be Thankful viewpoint, nearby hill walking routes, core paths and the Old Military Road.

There is potential for **minor negative or uncertain, or positive effects** on the people travelling along the Argyll Coastal Route within the corridor, depending on the route alignment and design of structures.

There is potential for delivering high-quality design and placemaking within the corridor, although the details cannot be confirmed at DMRB Stage 1.

## 8. Inter-relationships and Cumulative Effects

### 8.1 Inter-relationships

#### Overview

8.1.1 As set out in the Scottish Government's SEA Guidance (2013), 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.' Table 8.1 sets out the inter-relationship of environmental effects that could reasonably arise as a result of the project and which have been explored in the detailed topic assessments in Appendix C (Detailed Baseline and Assessment). These inter-relationships have been tailored to consider only what are considered significant interrelationships for the project. For example, air quality may be expected to have a significant inter-relationship with cultural heritage in other projects, where pollutant deposition could affect historic buildings, but this is not considered a significant issue for this project due to the rural nature of corridor 1. Some inter-relationships identified in Table 8.1 have the potential to result in a cumulative effect, which are discussed in Section 8.2.

**Table 8.1: Inter-relationships between SEA topics**

	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	✓		✓		✓		✓		

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

## 8.2 Cumulative Effects

### Overview

- 8.2.1 Annex I of the SEA Directive requires that the assessment of effects include secondary, cumulative, and synergistic effects (defined in Chapter 12: Glossary of Terms). 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<sup>15</sup> Secondary effects<sup>16</sup> (for example, the effects on secondary groundwater receptors such as GWDTE and groundwater abstractions from changes to groundwater flows or levels) are discussed in the SEA topic appendices (Appendix C: Detailed Baseline and Assessment).
- 8.2.2 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). The assessment of cumulative effects can therefore be considered as two separate components, referred to as 'types' for the purposes of this SEA:
- **Type 1 Cumulative Effects:** Cumulative effects on a single resource/receptor that can arise as the result of an accumulation of impacts of the project across multiple topics. While these effects may be minor in isolation, together they could result in a significant effect on an environmental resource/receptor. Examples of SEA topics with inter-relationships which could combine to result in cumulative effects are outlined in Section 8.1.
  - **Type 2 Cumulative Effects:** Cumulative effects on an SEA topic that can arise from the combined effects of plans or projects. For example, proposals along a linear route, such as a transport corridor, may cumulatively affect the landscape qualities experienced along that route (Scottish Government 2013).
- 8.2.3 Separate methodologies were employed for the two types of cumulative assessment and are set out in the following sections. It should be noted that the cumulative assessment is concerned with potentially negative effects only.

### Type 1 Cumulative Effects Methodology

- 8.2.4 To consider the potential for a combined effect of different SEA topic impacts on a single receptor/resource, a three-step process has been followed:
- Step 1: Review of SEA Potential Effects Summaries and Identification of Receptors/Resources
- 8.2.5 A list of all the receptors/resources considered in the SEA was compiled and a review of the potential effects from the individual topics was undertaken and, using professional judgement, the potential for interaction with other topic areas was identified. The spatial boundary of the receptor/resource with the potential to be affected by cumulative effects are defined in the study area for each environmental parameter as explained in Appendix C (Detailed Baseline and Assessment).
- 8.2.6 'Climatic factors' is not considered within the Type 1 assessment as this topic does not consider specific receptors/resources, although there is potential for the other topics to have a cumulative effect on climate and vice-versa (as shown in Table 8.1). The climatic factors assessment presented in Appendix C (Section 1: Climatic Factors) presents the overall effect on climate from multiple factors, including loss of carbon sequestration from woodland, peat and other natural habitats, embodied carbon required to construct the project, and vehicle emissions during operation.

<sup>15</sup>Synergistic effects interact to produce a total effect greater than the sum of the individual effects.

<sup>16</sup>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.

Step 2: Identification of Potential Cumulative Effects

- 8.2.7 Where the same receptor/resource was identified in relation to two or more individual topics, professional judgement was used to determine where multiple effects could combine to result in a cumulative effect.

Step 3: Identification of Significant Cumulative Effects and Proposed Mitigation

- 8.2.8 Where cumulative effects were identified, the nature of these combined effects were considered, taking account of likely duration (temporary or permanent), extent, frequency and sensitivity of the receptor, and the significance of the effect determined using professional judgement.
- 8.2.9 It is possible to have multiple significant effects which in combination do not constitute an additional significant (cumulative) effect. However, it is also acknowledged that there is potential that multiple non-significant effects (minor or uncertain) in combination could result in a significant cumulative effect, and therefore non-significant residual effects reported in the topic-specific sections in Appendix C (Detailed Baseline and Assessment) of this SEA were also reviewed.
- 8.2.10 Recommendations have been made to reduce the potential for cumulative effects.

**Type 2 Cumulative Effects Methodology**

- 8.2.11 The 'Type 2' cumulative effects assessment considered known and expected projects and other expected changes which are likely to form the future baseline for the SEA topics assessed for the project. General/underlying trends (e.g. changes in air quality over time, likely effects of climate change) and projections (e.g. of decreasing population in Argyll and Bute) have been included within the SEA topic assessments in Appendix C (Detailed Baseline and Assessment).
- 8.2.12 As stated in the Royal Town Planning Institute (RTPI) SEA Guidance, cumulative effects '*are all of the effects on components of sustainability: from the plan plus all other actions including people's behaviour and other underlying trends. The "nibbling" effects of a wide range of actions that cause climate change and habitat fragmentation are examples. Assessment of cumulative effects therefore requires a change of focus, from the plan to the sustainability components.*' (RTPI 2018, p.25)

**Cumulative effects = total plan effects + 'likely future without the plan'**

- 8.2.13 To consider the potential for a combined effect on the SEA topics from the A83 project and other projects, a three-step process has been followed.

Step 1: Identification of Plans

- 8.2.14 Cumulative effects between the project and other relevant projects are considered in relation to the nature and extent of the effects rather than set boundaries. However, with consideration of the likelihood of significant Type 2 cumulative effects arising, the search was focused according to the following parameters:
- development proposals identified within the Argyll and Bute and LLTNP local development plans within 5km of the route corridor;
  - road improvement works occurring along the A83 route; and
  - planned road infrastructure works in Scotland, with the potential for Type 2 cumulative effects with the A83 project to arise by virtue of their characteristics, scale, location, or timing.



- 8.2.15 Relevant developments were identified through online research and consultation with Argyll and Bute and LLTNPA.
- 8.2.16 Specific planning applications were scoped out of the assessment due to the strategic nature of the cumulative assessment at this stage; these will be considered at later DMRB stages once the project design is further developed and timescales become more certain.
- 8.2.17 Wider plans and strategies in the region – such as the Argyll and Bute Rural Growth Deal (Argyll and Bute Council 2021) - have been scoped out of the cumulative assessment due to the lack of detail and certainty available on specific project proposals. Plans, policies, and strategies and how they are related to the A83 project is set out in detail in Appendix B (Plans, Policies, and Strategies Review). A full review of the project's compliance with plans and policies will be undertaken at subsequent DMRB stages.

#### Step 2: Potential for Significant Cumulative Effects

- 8.2.18 Once the projects were identified and agreed, they were reviewed based on their location, type or status of development. Relevant environmental information included within planning applications and published environmental assessments was also considered where available.
- 8.2.19 Key Type 2 cumulative effects were identified where the plan is considered likely to have a significant negative effect, taking into account the Type 1 cumulative effects and when considered with other plans, projects and underlying trends.
- 8.2.20 Professional judgement was used to rate the potential cumulative effects in a matrix, with colours indicating positive, minor negative or uncertain, or significant negative effects, in accordance with the assessment scoring criteria set out in Chapter 6 (SEA Approach and Methods).

#### Step 3: Proposed Mitigation

- 8.2.21 Where potentially significant Type 2 cumulative effects were identified, recommendations have been included for mitigation measures which could reduce these effects.
- 8.2.22 Recommendations have been made to reduce the potential for cumulative effects.

#### **Limitations to Assessment**

- 8.2.23 The Type 1 cumulative effect assessment is based on a high-level, strategic assessment of likely significant effects on receptors/resources as reported in Appendix C (Detailed Baseline and Assessment). The actual significance of effects would be assessed once the design has been developed further, at subsequent DMRB stages. A degree of uncertainty regarding the conclusions is therefore acknowledged.
- 8.2.24 The Type 2 cumulative effect assessment has utilised available information on projects which is often not sufficiently detailed to quantify cumulative effects. As such, professional judgement was used where necessary to qualitatively ascertain the effects of the A83 project in combination with the likely future without the A83 project, in relation to each SEA topic. There may subsequently be additional projects which come to the fore with the potential for cumulative effects. A degree of uncertainty regarding the conclusions is therefore acknowledged.

#### **Type 1 Cumulative Effects Assessment**

- 8.2.25 Table 8.2 sets out the receptors/resources that were identified as overlapping between two or more SEA topics and the likely significant effect reported in the assessment.

Table 8.2: Type 1 Cumulative Effects

Receptor/ Resource	SEA Topic							
	Air Quality	Population and Human Health	Material Assets	Biodiversity	Water Environment	Soils	Cultural Heritage	Landscape and Visual Amenity
Population receptors (residential, road-users, NMUs, tourists)	-	-	-		-		-	--
Woodland/forestry (AWI, native and plantation)		-	-	--		-		--
Peat			-	--		-		
Species of conservation interest and habitats				--	--	-		
Loch Lomond and the Trossachs National Park		-		--				--

### Type 1 Cumulative Effects Conclusions

#### Population Receptors

8.2.26 During construction of any large-scale infrastructure it is recognised that there are likely to be unavoidable effects on people living nearby, or passing through the construction site. The potential cumulative effects on the population during construction of the project are summarised as follows:

- the population within the route corridor may be subject to several types of temporary disturbance such as changes to noise and vibration, air quality, visual amenity and access to/from properties. There is also potential for an increased flood risk during construction for nearby properties;
- NMUs using the forest paths within the corridor may also experience noise and vibration, air quality, and visual effects, as well as potential disruption due to diversions;
- tourists visiting the Rest and Be Thankful Memorial Stone may experience an effect on their enjoyment of the setting of the cultural heritage resource during construction; and
- road users may experience a negative change in views and potential increased journey length/delays due to diversions as a result of construction works.

- 8.2.27 At DMRB Stages 2 and 3, during the design development, the significance of these potential effects will be assessed in more detail. It is good practice for the construction of large infrastructure projects to implement mitigation measures through a CEMP, which would include subsidiary plans relating to, for example, flooding and pollution; soil management and erosion control; landscape and visual; waste management; ecology; air quality; and noise and vibration. A traffic management plan is also likely to be required to be produced by the appointed contractor to avoid or reduce disruption to the road traffic network and to NMUs. These mitigation measures are proposed at SEA level in the relevant topic sections of Appendix C (Detailed Baseline and Assessment), and would be carried forward to implementation at the construction stage. It is expected that these measures would reduce the effects on the population within the corridor; however, as it is not possible to entirely mitigate negative effects during this phase, due to the nature of construction activities, it is likely there would still be a **short-term, significant cumulative effect**.
- 8.2.28 Population receptors may experience similar cumulative effects during operation of the project. Local air quality could be affected and noise and vibration levels could increase, depending on the traffic levels using the route during operation (as outlined in Appendix C, Section 2: Air Quality and Appendix C, Section 3: Population and Human Health respectively); however, details of future traffic flows are unknown at this stage. Additionally, as the preferred route option within the corridor has not yet been chosen, it is not possible to determine the significance of effects on residents, NMUs, tourists, or road users during operation. Design development and measures would be outlined during DMRB Stages 2 and 3 once the preferred route option has been selected and design has been further developed. The extent to which mitigation measures would avoid or reduce the effects on individual receptors is unknown, therefore the **overall significance of cumulative effects on the population during operation is uncertain at SEA level**. Recommendations for reducing the potential for Type 1 cumulative effects on population receptors are outlined in Table 8.3.

Woodland/forestry (native and plantation)

- 8.2.29 For the purposes of the cumulative assessment, effects on AWI, native, and plantation woodland/forestry have been considered together due to the similarity of the cumulative effects predicted.
- 8.2.30 Woodland/forestry would be impacted by the project due to the felling required for its construction and operation. The loss of woodland/forestry as a natural resource could have the following effects:
- reduction in sequestration land and carbon sink value for climate change mitigation under the footprint of the project;
  - reduction in woodland/forestry used for tourism and recreational purposes, resulting in reduced opportunities for outdoor access;
  - reduction in woodland/forestry which can remove or reduce types of vehicle emissions;
  - loss of habitat to accommodate construction, resulting in reduced habitat quality and availability and fragmentation; and
  - reduction in woodland/forestry, resulting in negative effects on landscape elements and features, specifically.
- 8.2.31 Additionally, loss of Land Capability for Forestry (i.e. land with the potential to grow trees) is anticipated under the project footprint, reducing opportunities for future land use and potential carbon sequestration.
- 8.2.32 It is considered that the SEA recommendations set out in Appendix C (Detailed Baseline and Assessment) and in the draft monitoring framework set out in Chapter 10 (SEA Mitigation and Monitoring) appropriately address the potential effects on woodland/forestry listed in paragraph 8.2.30. Examples of mitigation measures are:
- minimising land-take from the project overall;

- minimising the loss of all existing vegetation and retain mature trees and woodland as well as ancient woodland wherever possible;
- taking account of local species composition, forest and woodland strategies, climate change adaptation and biosecurity threats when developing planting proposals; and
- replacing woodland lost through tailored planting mitigation to ensure contiguousness of woodland.

8.2.33 The full extent of potential cumulative effects on woodland/forestry would be dependent on the project route alignment and is unknown until the design is further developed. It is considered that the SEA recommendations and specific mitigation measures to be developed in subsequent DMRB stages would reduce the potential for cumulative effects on woodland/forestry, however the **overall significance of cumulative effects remains minor negative or uncertain at SEA level**. Recommendations for reducing the potential for Type 1 cumulative effects on woodland/forestry are outlined in Table 8.3.

#### Peat

8.2.34 It is likely that peat would be impacted by the project, due to high coverage of peat soils within the corridor. The loss of peat under the footprint of the project could result in the following effects:

- degradation of peatlands and loss of high-value carbon sink and sequestration land;
- loss of peat habitats under the footprint of the project could result in a reduction in habitat availability or habitat fragmentation; and
- loss of non-priority peat (sealing), loss of organic matter, compaction/structural degradation and changes in soil biodiversity.

8.2.35 Movement of peat soils would have a permanent, irreversible effect. It is considered that the SEA recommendations set out in Appendix C (Detailed Baseline and Assessment) and in the draft monitoring framework set out in Chapter 10 (SEA Mitigation and Monitoring) appropriately address the potential effects on peat listed in paragraph 8.2.34. Examples of mitigation measures are:

- developing the design to avoid areas of nationally important peat (Class 1 and 2) and limit loss of and disturbance to non-priority peat (Class 3, 4 and 5) and carbon-rich soils where practicable;
- implementation of a Peat Management Plan where peat cannot be avoided; and
- exploring opportunities for peat habitat restoration, enhancement and creation.

8.2.36 The full extent of potential cumulative effects on peat would be dependent on the option alignment and unknown until the design is further developed. It is considered that the SEA recommendations and specific mitigation measures to be developed in subsequent DMRB stages would reduce the potential for cumulative effects on peat, however the **overall significance of cumulative effects remains minor negative or uncertain at SEA level**. Recommendations for reducing the potential for Type 1 cumulative effects on peat are outlined in Table 8.3.

#### Species of Conservation Interest and Habitats

8.2.37 Multiple effects on species of conservation interest and habitats as a result of the project has the potential to result in an overall, cumulative loss of biodiversity. Significant negative effects are reported in Appendix C (Section 5: Biodiversity, Flora and Fauna) for badger, black grouse, pine marten, red squirrel and mountain hare, a minor negative or uncertain effect is reported for breeding birds.

8.2.38 Potential impacts that could interact cumulatively on these species of conservation interest are as follows:

- increased mortality and disturbance during construction of the project;
- loss of habitat under the footprint of the project resulting in fragmentation of habitat and the permanent reduction in availability of habitat for food, shelter, and breeding;

- increased mortality from new sections of road from collisions with road traffic;
- changes to water quality and hydromorphology, including groundwater, could impact biodiversity within the route corridor (particularly GWDTEs);
- changes to air quality within the route corridor from dust and nitrogen deposition, impacting the resilience of biodiversity; and
- changes in soil biodiversity from soil sealing and loss of non-priority peat, affecting the availability of habitat for food, shelter, and breeding.

8.2.39 It is likely that the potential for the above impacts to occur would be reduced through the recommendations outlined in Appendix C (Section 5: Biodiversity) and the other related SEA topic appendices, as per Table 8.2. Additionally, compensatory planting measures outlined in Appendix C (Section 9: Landscape and Visual Amenity) would assist in minimising habitat loss and providing potential enhancements once fully developed. However, should two or more of the impacts identified in paragraph 8.2.38 occur, there is potential for a cumulative effect on the viability of the local populations of species of conservation interest. Due to the diverse range of protected habitats and species present within the route corridor any cumulative effects on biodiversity has the potential to be significant at a national as well as a local level.

8.2.40 The full extent of potential cumulative effects on species of conservation interest and habitats would be dependent on the option alignment and unknown until the design is further developed. It is considered that the SEA recommendations and specific mitigation measures that will be developed in subsequent DMRB stages would reduce the potential for cumulative effects on peat, however the **overall significance of cumulative effects remains uncertain at SEA level**. A recommendation for reducing the potential for Type 1 cumulative effects on species of conservation interest and habitats is outlined in Table 8.3.

#### Loch Lomond and The Trossachs National Park

8.2.41 The corridor is situated within the LLTNP, which is a popular recreational park for tourists and local people alike. Potential effects on the LLTNP are as follows:

- temporary reduced access for people during construction due to diversions or potential road closures, reducing opportunities for outdoor recreation;
- loss and alteration of habitat to accommodate the project could result in a reduction in habitat availability or habitat fragmentation for species;
- effect on Special Landscape Qualities of LLTNP, Core Wilderness Areas and landscape character areas; and
- effect on views from LLTNP core paths.

8.2.42 SEA recommendations set out in Appendix C (Detailed Baseline and Assessment) and in the draft monitoring framework set out in Chapter 10 (SEA Mitigation and Monitoring) address the potential effects on the LLNPA identified in paragraph 8.2.41. Examples of mitigation measures include:

- regular consultation with the outdoor/access officer, head of tourism and other relevant stakeholders within the LLTNP during construction to ensure that any effects on the normal operations of the Park are minimised as far as possible;
- designing for the protection / enhancement of green and open spaces;
- adopting the principle of securing positive effects for biodiversity; and
- recognising, respecting and protecting the special landscape qualities of the National Park evident in the corridor and seeking to avoid significant negative effects on them and provide opportunities to experience them through careful design.

- 8.2.43 It is considered that the potential effects listed in paragraph 8.2.42, if not mitigated, could interact to have a negative cumulative effect on people’s general enjoyment of the Park and on tourism to the LLTNP, potentially affecting revenue. It is expected that these cumulative effects would be more significant in the short-term during construction and would reduce in the long-term once the project is operational and landscape planting is established. In the long-term, the project is expected to have a positive effect on accessibility to the LLTNP, though the long-term effects on landscape, core paths, and habitat and how this may affect enjoyment of the LLTNP are uncertain at this stage.
- 8.2.44 The full extent of potential cumulative effects on the LLTNP would be dependent on the project route alignment and is unknown until the design is further developed. It is considered that the SEA recommendations and specific mitigation measures that to be developed in subsequent DMRB stages would reduce the potential for cumulative effects on the LLTNP, however the **overall significance of cumulative effects remains uncertain at SEA level**. Recommendations for reducing the potential for Type 1 cumulative effects on the LLTNP are outlined in Table 8.3.

Natural Capital

- 8.2.45 While not listed as a topic under the SEA Directive – and therefore not assessed in this Environmental Report – it is recognised that by definition (refer to Chapter 1, paragraph 1.6.7) natural capital underpins all environmental receptors and resources. Multiple effects across environmental topics therefore could result in an overall cumulative effect on the ‘stock’ of natural capital from which people obtain ecosystem services. The proposed approach to assessing natural capital throughout the project lifecycle is outlined in Section 1.8 (Related Assessments) and it is considered that this will inherently consider the cumulative effect of the project across all SEA topics. A recommendation for monitoring the assessment of natural capital is provided in Table 8.3.

**Table 8.3: Type 1 Cumulative Effects Assessment Mitigation Recommendations**

Receptor/ Resource	Mitigation / Enhancement Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation	Consultation / Approvals Required	Monitoring
Population receptors within the corridor (residential, road-users, NMUs, tourists)	The alignment of the preferred route option shall be developed with cognisance of the potential for cumulative effects - from changes in noise and vibration, air quality, visual, access, tourism and recreation - on population receptors and should seek to avoid and reduce these where possible.	Throughout project lifecycle	Designer	n/a	To be monitored by Transport Scotland during subsequent DMRB stages.
Woodland/fo restry Peat LLTNP	Monitoring potential cumulative effects on receptors/resources identified in the SEA throughout design development and adjusting design/mitigation measures accordingly.	Throughout project lifecycle	Designer	n/a	To be monitored by Transport Scotland during subsequent DMRB stages.

Receptor/ Resource	Mitigation / Enhancement Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation	Consultation / Approvals Required	Monitoring
Species of conservation interest and habitats	Potential cumulative effects on the species of conservation interest and habitats should be assessed in more depth by ecologists at DMRB Stages 2 and 3 with cognisance of the principle of securing positive effects for biodiversity and national goals in relation to biodiversity.	DMRB Stage 2, DMRB Stage 3	Designer	n/a	To be monitored by Transport Scotland during subsequent DMRB stages
Natural capital	Ensure that natural capital and ecosystem services are assessed at every stage of design development and measured against the scheme objective TPO5, and appropriate mitigation and enhancement is incorporated.	Throughout project lifecycle	Designer	n/a	To be monitored by Transport Scotland during subsequent DMRB stages.

## Type 2 Cumulative Effects Assessment

8.2.46 Known and expected projects with the potential for cumulative effects with the A83 project by virtue of their characteristics, scale, location, or timing have been identified in Table 8.4.

**Table 8.4: Projects identified for inclusion in Type 2 Cumulative Effects Assessment**

Project Name and Location	Details	Timescale
<b>A83 Rest and Be Thankful Improvements</b> <i>(on the existing A83 within the route corridor)</i>	<p>Transport Scotland has invested over £13.6m in landslide risk reduction measures at the Rest and Be Thankful since 2007 (Transport Scotland 2020b). This includes developing local diversion routes and moving forward other recommendations from the route study.</p> <p>The Red Option consists of a range of hazard risk reduction measures proposed along the line of the existing road. The works include:</p> <ul style="list-style-type: none"> <li>▪ additional fencing</li> <li>▪ debris netting</li> <li>▪ drainage improvements</li> <li>▪ enhancement to slope vegetation</li> <li>▪ culvert improvements</li> </ul> <p>The planting of vegetation and forestry on the hillside, upslope of the A83 Trunk Road, is in the design and planning stage within the Forestry Commission, which will further reduce the risk of landslides.</p>	<p>All phases of the Red Option debris netting are now in place.</p> <p>Recommendations for further improvements on existing risk reduction measures were made in 2015. Tender was awarded on 24 February 2017 on the basis of a catch-pit solution at each of the high frequency channels.</p> <p>These risk reduction measures will continue to be implemented as and when necessary.</p>
<b>Old Military Road (OMR) Improvements</b>	<p>In December 2020, a 175m long, 6m high barrier was erected next to the OMR at the foot of the vulnerable channel formed by landslips in August and September to enable further use of the diversion during adverse weather.</p>	<p>Timescales around the OMR improvements are uncertain; however, it is likely that these measures would be in place prior to construction commencing on the A83 project.</p>

<i>(on the Old Military Road within the route corridor)</i>	There is potential for further targeted improvements at the OMR in the coming years to increase the resilience of the OMR as a temporary diversion route during any incidents on the A83 prior to the project being completed.	
<b>Arrochar &amp; Succoth Development Proposals</b> <i>(within 5km of route corridor)</i>	As set out in the LLTNPA Local Development Plan: Action Programme (2019), there are several sites within Arrochar and Succoth that have been allocated as 'placemaking priorities' for development. Proposals included in the Action Programme relate to the development of Arrochar Village Centre, new housing, holiday accommodation and a floating pontoon on Loch Long.	Timescales for development range between 2019 and 2024 depending on the site. Some sites having extant planning permission and others do not.
<b>A82 Tarbet to Inverarnan</b> <i>(A83 route begins at Tarbet and travels west, while the A82 continues north. Existing A82 is approximately 5.3km east of the route corridor)</i>	The Scottish Government's Strategic Transport Projects Review identified a number of measures to reduce congestion and improve traffic flows along several sections of the A82 between Tarbet and Inverarnan.  The DMRB Stage 2 assessment recommended consideration of both a 6m and 7.3m carriageway width (both with 1.0m hardstrips) during DMRB Stage 3. The assessment of these options was completed followed by a ministerial announcement that the 7.3m wide carriageway option had been selected for further development and assessment.	Transport Scotland are currently developing and assessing the preferred route option through DMRB Stage 3.  EIA and draft Orders are expected to be published in 2022.
<b>Major transport infrastructure projects (e.g. A9 Dualling Programme, A96 Dualling Programmes)</b> <i>(throughout Scotland)</i>	Major transport infrastructure projects are proposed throughout Scotland in the coming years to address road safety and economic concerns. Two notable schemes being progressed by Transport Scotland are the A9 Dualling Programme: Perth to Inverness and the A96 Dualling Programme: Inverness to Aberdeen. Both schemes propose replacement of single carriageway sections of the road with new dual carriageway.	EIA and draft Orders have been published for all nine sections of the A9 Dualling Programme. The Luncarty to Pass of Birnam section is currently under construction, with construction on the remaining sections due to commence in the next few years.  EIA and draft Orders for the A96 Inverness to Nairn section were published in 2018. Scottish Ministers approved the draft Orders in February 2021.  The other sections of the A96 Dualling Programme are at the earlier stages of DMRB.
<b>Argyll and Bute STPR2 Projects</b> <i>(throughout Scotland)</i>	The STPR2 Initial Appraisal Case for Change: Argyll and Bute Region Report (Jacobs / AECOM 2021a) sets out the outcomes of the sifting exercise undertaken regarding the transport options generated by policy review, stakeholder consultation, and the project team. Following sifting, 96 options specific to the Argyll & Bute Region remain in the process. There are many of these options that share common traits across the regions and many options which in isolation would not deliver the strategic improvements STPR2 is seeking to deliver.  The options have been grouped under the following categories: <ul style="list-style-type: none"><li>▪ Active Travel;</li><li>▪ Behaviour Change;</li><li>▪ Rail;</li><li>▪ Public Transport;</li><li>▪ Ferries / Island Connectivity;</li><li>▪ Road;</li></ul>	The STPR2 and the accompanying SEA Environmental Report are expected to be published later in 2021.  The timing of the proposals outlined in STPR2 will be confirmed in the final STPR2 reporting, expected to be in summer 2021.



	<ul style="list-style-type: none"><li>▪ Freight;</li><li>▪ Technology;</li><li>▪ Multimodal;</li><li>▪ Mass Transit.</li></ul> <p>These Groupings will be appraised in the next stages of STPR2. The Groupings represent the range of interventions that STPR2 will consider in the appraisal stages.</p>	
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8.2.47 The Type 2 cumulative effects assessment is presented in Table 8.5.

Table 8.5: Type 2 Cumulative Effects Assessment

SEA Topic	Effect of A83 Project	Type 2 Cumulative Effect [column 2 of table + likely future without plan]	Proposed Mitigation
<b>Climatic factors</b>	<p>Minor negative or uncertain effects from loss of forestry and peat resulting in loss of high value carbon sink and sequestration land, embodied carbon from materials used in construction, and reduction in natural flood management.</p> <p>These effects are not anticipated to be significant.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would lead to the loss of vegetation or trees to some degree, resulting in loss of carbon sequestration. Embodied carbon is inherent to construction activities and is associated with all projects outlined in Table 8.4.</p> <p>Major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater impacts on climate than the smaller projects (e.g. housing developments) due to the loss of woodland and large quantities of materials required. These would also result in operational vehicle emissions in the short to medium term ahead of the gradual shift towards electric vehicles as outlined in Scottish Government policy.</p> <p>There is potential for a significant cumulative effect on climatic factors in the short to medium term from the projects outlined in Table 8.4 in combination with the A83 project, though it is recognised that many of these projects would also improve the resilience of infrastructure to impacts associated with climate change.</p>	<ul style="list-style-type: none"> <li>A review of lessons learned and good practice across the industry in relation to decarbonisation of construction is recommended, including appropriate training sessions.</li> <li>It is considered that Scottish Government policies in relation to net-zero emissions by 2045 would mitigate effects in the long-term.</li> </ul>
<b>Air quality</b>	<p>Minor negative or uncertain effects from dust generated from site activities and emissions from vehicular movements during construction and pollutant emissions generated by vehicles using the road during operation.</p> <p>These effects are not anticipated to be significant.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would lead to changes in air quality during construction to some degree.</p> <p>Major infrastructure works outlined above such as the A82, A9 and A96 Dualling projects would have greater impacts air quality during construction and operation than the smaller projects, in the short to medium term ahead of the gradual shift towards electric vehicles as outlined in Scottish Government policy.</p> <p>In the long-term, cumulative effects on air quality are not anticipated to be significant.</p>	<p>No significant cumulative effect predicted therefore no additional mitigation proposed.</p>
<b>Population and Human Health</b>	<p>During construction, significant negative effects on population and human health could arise from construction activities due to:</p> <ul style="list-style-type: none"> <li>increased traffic volumes, resulting in diversions and affecting journey lengths</li> <li>noise nuisance and vibration caused by traffic and activities</li> </ul>	<p>It is expected that most of the projects outlined in Table # would involve similar effects on population and human health during construction to some degree, due to the general nature of construction activities.</p> <p>It is considered there is potential for the A82 Tarbet to Inverarnan project to have a cumulative effect with the A83 project on population receptors in relation to impacts on traffic flows and accessibility, should construction phases overlap. These effects are anticipated to be short-term, but significant. The improvement works at the OMR and Rest and Be Thankful prior to commencement of the A83 could also result in effects from construction activities being experienced by population receptors for a longer duration.</p>	<ul style="list-style-type: none"> <li>Short-term construction impacts would already be mitigated at a project level by measures such as Construction Management Plans and Traffic Management Plans.</li> <li>However, it is recommended that that a joint Traffic Management Plan for the A83 and A82 be produced, should it be expected that construction phases would overlap.</li> </ul>

SEA Topic	Effect of A83 Project	Type 2 Cumulative Effect [column 2 of table + likely future without plan]	Proposed Mitigation
	<p>associated with construction works;</p> <ul style="list-style-type: none"> <li>reduced air quality from construction dust and vehicle emissions; and</li> <li>reduced accessibility to green spaces and tourist/recreation facilities.</li> </ul> <p>These effects are anticipated to be short-term, but significant.</p> <p>Potential for longer term effects on noise and air quality during operation but overall, significance of Type 1 cumulative effects on the population during is minor negative to uncertain at SEA level.</p>	<p>All the other projects in Table # are geographically remote enough from the A83 project that it is considered there is a low likelihood of the same population receptors experiencing cumulative effects related to noise and air quality during construction and operation, as these effects would be localised.</p> <p>No additional cumulative effects on population receptors are anticipated during operation.</p>	
<b>Material Assets</b>	<p>Minor negative or uncertain effects from loss of forestry and peat resulting in loss of high value carbon sink and sequestration land, construction consuming raw materials and energy, waste generated during construction, and disruption to the existing A83 and surrounding road network.</p> <p>These effects are not anticipated to be significant.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would involve the loss of vegetation or trees to some degree, resulting in loss of carbon sequestration. Consumption of raw materials and energy is inherent to construction activities and is associated with all projects outlined in Table 8.4. Waste generated by construction activities would impact on the capacity of waste management facilities within Scotland.</p> <p>Major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater impacts on material assets than the smaller projects (e.g. housing developments) due to the loss of woodland and large quantities of materials required and waste generated during construction.</p> <p>There is potential for a significant cumulative effect on material assets from the projects outlined in Table 8.4 in combination with the A83 project, though it is recognised that many of these projects would also improve the resilience of the transport network, which are important built assets themselves.</p>	<ul style="list-style-type: none"> <li>A collaborative approach between Transport Scotland projects is recommended, including sharing of best practice methods and appropriate training sessions, in relation to decarbonisation of construction, including sustainable sourcing of materials and reducing waste.</li> </ul>
<b>Biodiversity</b>	<p>Minor negative or uncertain effects on qualifying features of Beinn an Lochain SSSI.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would lead to effects on biodiversity to some degree, due to disturbance from construction activities and/or loss of habitat under the project footprint.</p>	<ul style="list-style-type: none"> <li>Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on the biodiversity from A83</li> </ul>

SEA Topic	Effect of A83 Project	Type 2 Cumulative Effect [column 2 of table + likely future without plan]	Proposed Mitigation
	<p>Significant negative effects assessed on species of conservation interest and habitats from construction activities and loss of habitat under project footprint.</p> <p>Due to the diverse range of protected habitats and species present within the route corridor any Type 1 cumulative effects on biodiversity has the potential to be significant at national as well as a local level, however at SEA level the overall significance remains uncertain.</p>	<p>Works undertaken on the A83 within the route corridor, such as the OMR and Rest &amp; Be Thankful improvements have the potential to impact on the same biodiversity receptors as the A83 project, such as local species populations, Beinn an Lochain SSSI and habitats generally.</p> <p>Major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater impacts on biodiversity than the smaller projects (e.g. housing developments) due to the larger scale and duration of construction impacts and potential for greater loss of habitat under the project footprint. A significant effect could arise from these projects on species due to the cumulative effect on mortality rates caused by vehicle traffic collisions.</p> <p>While species population decline and/or loss of habitat may not be considered significant from a single project outlined in Table 8.4 in isolation, when these effects are considered together there is potential for a significant effect on biodiversity at a strategic level.</p>	<p>project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</p> <ul style="list-style-type: none"> <li>▪ Cognisance of the principle of securing positive effects for biodiversity and national biodiversity goals to be considered at all stages of the A83 project lifecycle.</li> <li>▪ It is recommended that further study is undertaken by Transport Scotland in consultation with NatureScot and LLTNP where relevant, to identify cumulative effects on species of conservation interest and habitat loss as a result of major Transport Scotland infrastructure projects. Appropriate mitigation and monitoring measures would then be proposed to target significant effects on specific species/habitats.</li> </ul>
<p><b>Water Environment</b></p>	<p>Minor negative or uncertain effects assessed on water quality, hydromorphology, hydrogeology and flood risk during construction. These effects are not anticipated to be significant.</p> <p>Minor negative or uncertain effects assessed on water quality and flood risk, and significant negative effects assessed on hydromorphology and hydrogeology during operation.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would lead to construction impacts on watercourses to some degree.</p> <p>Works undertaken on the A83 within the route corridor, (i.e. the OMR and Rest &amp; Be Thankful improvements), have the potential to impact on the same watercourses as the A83 project, or impacts on multiple watercourses could have a cumulative effect on a single waterbody (e.g. rivers outfalling to Loch Long).</p> <p>Major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater impacts on the water environment than the smaller projects (e.g. housing developments) due to the scale and extent of construction activities and channel realignments required.</p> <p>While alterations to channels or pollution to watercourses may not be considered significant from a single project outlined Table 8.4 in isolation, when these effects are considered together there is potential for a significant effect on the water environment at a strategic level.</p>	<ul style="list-style-type: none"> <li>▪ Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on the water environment from A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</li> </ul>
		<p>No significant cumulative effects are anticipated for flood risk as the SPP system should prevent development which would have a significant probability of being affected by flooding or would increase the probability of flooding elsewhere.</p>	<p>No significant cumulative effect predicted therefore no additional mitigation proposed.</p>

SEA Topic	Effect of A83 Project	Type 2 Cumulative Effect [column 2 of table + likely future without plan]	Proposed Mitigation
<b>Soils</b>	<p>Minor negative or uncertain effect assessed on soils, non-priority peat, geology, LCA and LCF due to loss and disturbance.</p> <p>These effects are not anticipated to be significant.</p>	<p>It is expected that most of the projects outlined in Table 8.4 would lead to construction impacts on soils to some degree.</p> <p>Works undertaken on the A83 (i.e. the OMR and Rest &amp; Be Thankful improvements) also have the potential to impact on the soil within the route corridor for the A83 project. Loss of LCA and LCF soils could result in the area being less commercially viable for agriculture and forestry. There may also be cumulative effects on soil biodiversity and loss of carbon sequestration (as reported under Climatic Factors and Material Assets).</p> <p>Major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater impacts on soils than the smaller projects (e.g. housing developments) due to the scale and extent of construction activities and disturbance/movement of soils required.</p> <p>While alterations to soils may not be considered significant from a single project outlined Table 8.4 in isolation, when these effects are considered together there is potential for a significant effect on soils at a strategic level.</p>	<ul style="list-style-type: none"> <li>Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on soils from A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</li> </ul>
<b>Cultural heritage</b>	<p>Minor negative or uncertain effect due to potential for the impacts on physical elements of cultural heritage resources, permanent changes on the setting of cultural heritage resources, and uncertainty around access to cultural heritage resources.</p>	<p>Works undertaken on the A83 (i.e. the OMR and Rest &amp; Be Thankful improvements) also have the potential to impact on the cultural heritage resources – the Glen Croe 'Rest and be Thankful' Stone - within the route corridor for the A83 project, potentially resulting in cumulative effects on access, setting, and physical elements of the Stone.</p> <p>Some of the major infrastructure works outlined Table 8.4 such as the A82, A9 and A96 Dualling projects, intersect nationally important heritage sites, and would result in effects on other cultural heritage resources.</p> <p>The A83 project is not anticipated to contribute to a significant cumulative effect on cultural heritage resources as there is only one designated cultural heritage resource within the route corridor. The potential for cumulative effects on cultural heritage resources between other projects at a strategic level have, or would be, assessed within the SEA/EIA for those projects.</p>	<p>No significant cumulative effect predicted therefore no additional mitigation proposed.</p>
<b>Landscape and visual amenity</b>	<p>Significant negative effects due to impacts on landscape receptors such as the Special Qualities of the LLTNP, LLTNP core wildness areas, Upland Glens Loch Lomond &amp; The Trossachs LCT 252, Highland Summits LCT 251, and local landscape elements and</p>	<p>It is expected that most of the projects outlined in Table 8.4 would have landscape and visual impacts to some degree.</p> <p>Works undertaken on the A83 within the route corridor, (i.e. the OMR and Rest &amp; Be Thankful improvements), have the potential to impact on the same landscape receptors as the A83 project, resulting in a cumulative effect.</p> <p>Major infrastructure works outlined in Table 8.4 such as the A82, A9 and A96 Dualling projects would have greater landscape and visual effects than the smaller projects (e.g. housing</p>	<ul style="list-style-type: none"> <li>Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on landscape receptors from the A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</li> </ul>

SEA Topic	Effect of A83 Project	Type 2 Cumulative Effect [column 2 of table + likely future without plan]	Proposed Mitigation
	<p>features such as Loch Restil, woodland, forestry and distinct landform.</p>	<p>developments) due to the scale and extent of construction activities and the permanent change to the landscape during operation, though effects would reduce following establishment of landscape planting proposals.</p> <p>Changes to the landscape and views across Scotland as a result of the projects outlined in Table 8.4 in combination with the A83 project, particularly in areas of natural beauty favoured by tourists, may result in the potential for a significant cumulative effect at a strategic level.</p>	<ul style="list-style-type: none"> <li>▪ Landscape design principles have been developed across the A9 and A96 Dualling for programme-wide consistency, and will also be developed for the A83 project in subsequent DMRB stages, and it is expected that these will contribute to mitigating potential cumulative effects.</li> </ul>

### Type 2 Cumulative Effects Conclusions

- 8.2.48 Potential significant negative cumulative effects were predicted for the Climatic Factors and Landscape and Visual Amenity SEA topics. While the predicted effects on the Soils and Water Environment (hydromorphology and hydrogeology) SEA topics are not considered significant from a single project in isolation, when these effects are considered together there is potential for a significant cumulative effect.
- 8.2.49 There is potential for a significant cumulative effect on Material Assets from the projects outlined in Table 8.4 in combination with the A83 project, although it is recognised that many of these projects would also improve the resilience of the transport network, which are important built assets.
- 8.2.50 It is expected that most of the projects outlined in Table 8.4 would lead to temporary changes in air quality during construction to some degree. Similarly, there could be construction-stage effects on the population and human health SEA topic, related to traffic volumes and noise, air quality, disturbance and reduced accessibility. At a localised level, the A82 Tarbet to Inverarnan, A83 Rest and Be Thankful and Old Military Road Improvements may result in short-term significant cumulative effects with the A83 project should construction phases of the two or more of these projects overlap. However, in the long-term, cumulative effects on Air Quality and Population and Human Health are not anticipated to be significant.
- 8.2.51 At a strategic level, the other major infrastructure works planned in Scotland have the potential to combine with the A83 project to result in a cumulative effect on Climatic Factors, Materials and Biodiversity. It is expected that during subsequent DMRB stages the mitigation and enhancement recommendations outlined in this SEA would be developed to further reduce effects from the A83 project. However, further work and collaboration between the major infrastructure projects outlined in Table 8.4 would be required where possible to better understand, measure, and reduce potential cumulative effects.
- 8.2.52 Mitigation measures have been proposed for all significant cumulative effects identified in Table 8.5. Mitigation and enhancement measures for each SEA topic are described in more detail in Chapter 10 (SEA Findings and Recommendations).

## 9. SEA Findings and Recommendations

### 9.1 Summary of Key Findings

9.1.1 Five possible route options within the corridor, described in Chapter 5 (Project Description) have been considered as part of the SEA. This chapter summarises the likely significant effects and opportunities of the project for the SEA topics presented in Chapter 7 (Environmental Constraints and Opportunities). The following SEA topics were assessed to have no significant effects at SEA level:

- Climatic Factors;
- Air Quality;
- Population and Human Health;
- Soils; and
- Cultural Heritage.

9.1.2 Table 9.1 sets out the likely significant effects reported in the SEA. Likely significant effects were reported for the following SEA topics and sub-topics:

- Biodiversity (designated sites, other habitats, species of conservation interest).
- Water Environment (hydrogeology, hydromorphology); and
- Landscape and Visual Amenity (National Park, various landscape and visual receptors, including landscape character and viewpoints).

9.1.3 The SEA has found that all five possible route options would need further survey and assessment at DMRB Stage 2 and Stage 3 to effectively mitigate the potential negative environmental effects described in this Environmental Report.

9.1.4 The potential significant effects reported in Table 9.1 are at a strategic level and it is expected that through design development and mitigation measures at subsequent DMRB stages it would be possible to avoid or reduce these effects.

9.1.5 The green box following Table 9.1 sets out the potential environmental opportunities identified at SEA level.



Table 9.1: Likely Significant Effects reported in the Environmental Report

Resource/Receptor/Sub-topic	Potential Significant Effect	Effect Duration
<b>Biodiversity</b>		
<b>Designated sites - Construction</b>		
Glen Etive and Glen Fyne SPA (SNH site code: 10113, EU site code: UK9020307)	Noise, vibration and light spill associated with construction related activities, could result in disturbance of golden eagle, a designated feature of the SPA.	Short- to Medium-term, temporary
Beinn an Lochain SSSI (SNH site code: 163, EU site code: 135092)	Temporary loss of SSSI habitat could result in loss of site condition.	Medium- to Long-term, reversible
	Generation of dust and airborne pollutants from construction activities could cause degradation of SSSI habitat.	Short- to Medium-term, reversible
Loch Lomond and The Trossachs National Park	Temporary loss of habitat within the LLTNP could result in a reduction in extent of habitats used by species of conservation interest.	Medium- to Long-term, reversible
<b>Habitats - Construction</b>		
Native woodland	Temporary loss of habitat to accommodate construction could result in reduced habitat quality and availability, and fragmentation.	Long-term, reversible
Plantation woodland		Long-term, reversible
Peat habitats	Potential loss or alteration of this habitat to accommodate construction would result in a reduction in extent and distribution of this habitat.	Long-term, reversible
<b>Designated Sites - Operation</b>		
Beinn an Lochain SSSI (SNH site code: 163, EU site code: 135092)	Loss and alteration of SSSI habitat under the footprint of the preferred route option could result in habitat fragmentation and the loss of site condition. This effect would be permanent.	Long-term, permanent
Loch Lomond and The Trossachs National Park	Loss and alteration of National Park habitat to accommodate the preferred route option could result in a reduction in habitat availability or habitat fragmentation for LLTNPA priority species and other species that rely on it for food, shelter and breeding. This effect would be permanent.	Long-term, permanent
<b>Habitats - Operation</b>		
GWDTEs	Changes to groundwater flows under the footprint of the preferred route option could result in potential loss or alternation of habitat. This effect may not be localised to construction footprint and would be permanent.	Long-term, permanent

Resource/Receptor/Sub-topic	Potential Significant Effect	Effect Duration
Native woodland	Potential loss of native woodland habitat under the footprint of the preferred route option could result in a reduction in habitat availability or habitat fragmentation. This effect could be permanent.	Long-term, permanent
Peat habitats	Potential loss of peat habitats under the footprint of the preferred route option could result in a reduction in habitat availability or habitat fragmentation. This effect could be permanent.	Long-term, permanent
<b>Species of Conservation Interest - Operation</b>		
Badger	Potential permanent loss of habitat within a badger clan territory under the footprint of the preferred route option could cause a reduction in availability or fragmentation of habitat. This effect would be long-term.	Long-term, permanent
	The creation of new sections of road could result in increased injury or mortality of badger due to collisions with road traffic. This effect would be permanent.	Long-term, reversible
Black grouse	Potential loss of suitable breeding habitat under the footprint of the preferred route option could result in reduced breeding success.	Long-term, permanent
	The creation of new sections of road could result in increased injury or mortality of black grouse due to collisions with road traffic. This effect would be permanent.	Long-term, reversible
Pine marten Red squirrel Mountain hare	Potential loss of habitat under the footprint of the preferred route option could result in fragmentation of habitat and the permanent reduction in availability of this habitat to pine marten, red squirrel and mountain hare that rely on it for food, shelter and breeding.	Long-term, permanent
	The creation of new sections of road could result in increased injury or mortality of badger due to collisions with road traffic. This effect would be permanent.	Long-term, reversible
<b>Water Environment - Construction</b>		
Hydrogeology	Effects on groundwater aquifers or secondary groundwater receptors (such as GWDTEs or groundwater abstractions) from dewatering activities during construction.	Short-term, temporary
<b>Water Environment - Operation</b>		
Hydromorphology	Permanent changes to hydromorphology through permanent modifications to watercourse morphology or in-channel structures.	Long-term, permanent
Hydrogeology	Effects on groundwater aquifers and secondary groundwater receptors (such as GWDTE and groundwater abstractions) from permanent or long-term changes to groundwater flows or levels.	Medium-term to Long-term, permanent (dependent on vertical alignment and design details).

Resource/Receptor/Sub-topic	Potential Significant Effect	Effect Duration
<b>Landscape and Visual Amenity</b>		
<b>Landscape Receptors</b>		
Special Landscape Qualities of the LLTNP	Potentially permanent significant negative effects are likely and can only partially be reduced with mitigation	Long-term and Permanent
LLTNP Core Wildness areas on the slopes of The Cobbler and Beinn Luibhean		Long-term and Permanent
Upland Glens - Loch Lomond & the Trossachs LCT 252		Long-term and Permanent
Highland Summits LCT 251		Long-term and Permanent
Landscape Elements and Features (Loch Restil, woodland and forestry)		Long-term and Permanent
<b>Visual Receptors</b>		
Residential receptors	Potentially permanent significant negative effects are likely on views experienced by people at residential properties and can only partially be reduced with mitigation	Long-term and Permanent
LLTNP Viewpoint: A83 viewpoint, Glen Croe (at Rest and Be Thankful car park)	Potentially permanent significant negative effects are likely on people experiencing the scenic views from this location and can only partially be reduced with mitigation	Long-term and Permanent
Ben Donich hill walking trail	Potentially permanent significant negative effects are likely on hikers and can only partially be reduced with mitigation	Long-term and Permanent
Beinn Luibhean hill walking trail		Long-term and Permanent
Beinn an Lochain hill walking trail		Long-term and Permanent
LLTNP core paths	Potentially permanent significant negative effects are likely on walkers and can only partially be reduced with mitigation	Long-term and Permanent
Old Military Road	Potentially permanent significant negative effects are likely on people walking, cycling or driving along this route and can only partially be reduced with mitigation	Long-term and Permanent

### Key Opportunities

Opportunities have been identified in the SEA for enhancements that could be implemented through the project to have a positive effect on the wider area, as follows:

- An opportunity for the project to employ methods for decarbonisation of construction, through innovation in design, procurement and construction methods. Similar work undertaken to date in exploring options for decarbonising construction on other road schemes could be used as a basis for developing these methods.
- Through the improvement in resilience provided as a result of the mitigation of landslide induced closures, there may be greater opportunities for residents of Argyll and Bute to transition from a petrol/diesel car to an electric vehicle, due to enhanced certainty regarding travel distances.
- Through the infrastructure provided there may be opportunities to positively affect the uptake of active travel undertaken within the corridor, both from local trips to be made via active modes, and for additional trips to be generated resulting from increased use of the infrastructure provided by visitors and tourists.
- There may be opportunities for the new parking facilities at the Rest and Be Thankful viewpoint to incorporate green infrastructure – for example, by using natural terrains to reintroduce biodiversity.
- The project could provide an opportunity to contribute towards the Scottish Government's Vision Zero road safety target of zero fatalities and injuries on Scotland's roads by 2050 through reductions in vehicle journeys associated with fewer road closures and the associated long diversion routes for strategic traffic travelling to and from Argyll and Bute.
- There may be opportunities for improving biodiversity in the long-term, with adoption of the principle of securing positive effects for biodiversity throughout the project lifecycle to ensure compliance with government policy and DMRB guidance.
- There may be opportunities to improve watercourse hydromorphology, for example where watercourses have existing modifications, and to reduce the likelihood of fluvial flood risk through upgrading watercourse crossings with insufficient capacity in line with current design standards.
- The viaducts included as part of the Yellow (1.8km-long), but also Brown (0.3km-long), Green (0.3km and 0.2km long) and potentially Purple Route Option could result in significant landscape and visual effects, although, with careful design and mitigation the effect could be reduced or even made beneficial, should these structures be designed as elegant features, well integrated into the backdrop of the views and appropriately juxtaposed with the dramatic scenery. If designed sensitively in this manner to fit the context of the corridor within Glen Croe, these structures could contribute to placemaking and potentially become landmarks and enhance their surroundings.

## 9.2 Key Recommendations

- 9.2.1 The five possible route options considered in the SEA are in the early stages of design development and as such, a detailed option comparison assessment has not been undertaken. However, the SEA topic assessments have considered these at a high level, and where there would be potential for a possible route option to present comparatively more environmental constraints than the other options, this has been highlighted in Appendix C (Detailed Baseline and Assessment). This section summarises the findings in relation to the possible route options and sets out the SEA recommendations for future design development and assessment.
- 9.2.2 The SEA finds that none of the possible route options should be discounted on environmental grounds and in many instances, due to the stage of assessment and lack of design detail, it is difficult to differentiate between the possible route options and their associated environmental effects. However, as environmental protection is the central function of the SEA, it recommends that, where feasible, the choice of route alignment within corridor 1 should prioritise the least environmentally constrained areas, to reduce the overall associated environmental effects and promote environmental protection as part of the project. This would also help to reduce the time required for additional iterative design and approvals, such as environmental licences.
- 9.2.3 Although no possible route options have been discounted as a result of SEA, in some instances possible route options are considered to be more or less constrained than others in relation to the specific environmental subtopics considered within Appendix C (Detailed Baseline and Assessment) and summarised in Chapter 7 (Environmental Constraints and Opportunities). Table 9.2 provides a summary of these key environmental constraints. Where possible, differences in constraints between the possible route options are highlighted.

**Table 9.2: Key Constraints in Relation to Possible route options**

SEA Topic	Key Constraints in Relation to Possible route options
<b>Climatic Factors</b>	<ul style="list-style-type: none"> <li>The Pink and Purple Route Options would have highest emissions due the carbon intensive nature and energy usage associated with tunnelling.</li> <li>The Yellow and Green Route Options require construction of viaducts and would be expected to have the next highest emissions after the tunnel options due to the material requirements for viaduct construction. The Yellow Route Option would have higher emissions due to the requirement for a longer viaduct with 37m high piers compared to the smaller Green Route Option viaduct of 0.3km.</li> <li>The Brown Route Option would be expected to have the lowest emissions due to the option largely following the alignment of the existing A83, although it does require construction of a 0.3km viaduct.</li> <li>The differentiators from effects on high carbon value peat is considered in the 'Soils' row.</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>The Brown Route Option largely follows the existing road alignment and is therefore considered likely to involve less movement of materials - which generates construction dust and affects air quality - than the other four possible route options.</li> <li>No traffic modelling has been undertaken, therefore it is not possible to differentiate between operational air quality effects between the possible route options at this stage.</li> </ul>
<b>Population and Human Health</b>	<ul style="list-style-type: none"> <li>The Purple and Pink Route Options are considered more environmentally constrained than non-tunnelled options in terms of potential impacts on local people from construction activities associated with the tunnel, such as increased noise and vibration levels, and journey length/amenity impacts for NMUs.</li> </ul>
<b>Material assets</b>	<ul style="list-style-type: none"> <li>The Green Route Option would potentially avoid Land Capability for Forestry (LCF) Class 4, the land with the greatest flexibility for growth and management of tree crops within the corridor, which is a natural asset.</li> <li>The Purple Pink Route Options, which both include the use of a tunnel, would be expected to have a lesser effect on surface natural assets than those at ground level.</li> </ul>

SEA Topic	Key Constraints in Relation to Possible route options
	<ul style="list-style-type: none"> <li>▪ The Pink and Purple Route Options require construction of a tunnel and would have the highest requirement for materials and energy. Significant volumes of cut material would be generated requiring treatment and disposal.</li> <li>▪ The Yellow and Green Route Options require construction of viaducts and would be expected to have the next highest material requirements after the tunnel options. The Yellow Route Option would have greater material requirements due to the longer viaduct with 37m high piers compared to the smaller Green Route Option viaduct of 0.3km.</li> <li>▪ The Brown Route Option would be expected to have the lowest requirement for materials and would generate the least waste due to the option largely following the alignment of the existing A83, although it does require construction of a 0.3km viaduct.</li> <li>▪ The Green Route Option would require realignment of the A83 and B828 junction as well as repositioning of a section of the Rest and Be Thankful carpark, however this effect would be temporary in nature.</li> </ul>
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>▪ Of the five possible route options presented, the Brown Route Option is considered to be the least environmentally constrained in terms of biodiversity as works would be in the vicinity of the existing A83 and would not impact any site designated for nature conservation.</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>▪ Potential effects for all possible route options within the corridor will likely be similar in nature, and all options have the potential for minor negative or significantly negative effects on the water environment.</li> </ul>
<b>Soils</b>	<ul style="list-style-type: none"> <li>▪ The Purple Pink Route Options both incorporate tunnels and would cause disturbance to bedrock geology.</li> <li>▪ Soil sealing, including of carbon-rich soils and peat, would be unavoidable for all possible route options. The extent of soil sealing is influenced by both the alignment of the possible route options (on-line and off-line) and their design (incorporation of tunnels and viaducts). Overall, the possible route option with the greatest potential for soil sealing is the 4.9km off-line Green Route Option, which has the potential to result in soil sealing across 4.4km and which incorporates a short section (0.5km) of viaduct. Overall, the possible route option with the least potential for soil sealing is the 2.1km off-line Yellow Route Option which has the potential to result in soil sealing across 0.3km and which incorporates a 1.8km viaduct.</li> <li>▪ The Purple, Brown, Pink and Yellow Route Options intersect predominantly Class 3 peat and the Green Route Option intersects predominantly Class 5 peat.</li> <li>▪ The possible route options do not affect prime agricultural land nor land with good or greater flexibility for the growth and management of tree crops. The Green Route Option would avoid land with moderate flexibility for the growth and management of tree crops.</li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>▪ The offline Green, Purple and Yellow Route Options are considered the most environmentally constrained in terms of potential effects to cultural heritage resources during construction and operation, including their setting, in comparison to the online Brown Route Option or the Pink Route Option, which is largely proposed to be within a tunnel.</li> </ul>
<b>Landscape and Visual Amenity</b>	<ul style="list-style-type: none"> <li>▪ The Brown Route Option is considered least environmentally constrained in terms of the landscape and visual effects on nearby landscape and visual receptors (except people travelling on the Argyll Coastal Route) due to the smallest footprint and closest alignment along the existing A83 out of the five options. Nevertheless, the Brown Route Option could potentially result in significant negative effects on the Special Qualities of the LLTNP, the local landscape character, people at the Rest and Be Thankful and Gleann Mor viewpoints, walkers on hill walking trails, people travelling on the Old Military Road and residential receptors as a result of introducing the debris flow shelter and viaduct structures</li> <li>▪ The Yellow Route Option is likely to result in significant effects on the Special Qualities of the LLTNP, the local landscape character and LLTNP core wildness areas, the landscape elements and features, people at the Rest and Be Thankful viewpoint, walkers on the LLTNP core paths and hill walking trails, people travelling on the Old Military Road and residential receptors due to the introduction of a large-scale viaduct, deflector structures and earthworks.</li> <li>▪ The Green Route Option is likely to require numerous and potentially extensive earthworks or slope stabilisation measures on either side, resulting in the loss of existing forestry and significant negative effects on the Special Qualities of the LLTNP, the local landscape character, landscape elements and</li> </ul>

SEA Topic	Key Constraints in Relation to Possible route options
	<p>features and LLTNP areas of core wildness as well as walkers on the LLTNP core paths and hill walking trails, people travelling on the Old Military Road and views from Rest and Be Thankful viewpoint.</p> <ul style="list-style-type: none"> <li>▪ The Purple Route Option is likely to result in significant negative effects on the Special Qualities of the LLTNP and the local landscape character, the LLTNP core wildness, landscape elements and features, people at the Rest and Be Thankful viewpoint, walkers on the LLTNP core paths and hill walking trails, people travelling on the Old Military Road and residential receptors due to the large-scale embankment or viaduct, tunnel, additional landslide protection mitigation works and a realigned A83/ B828 junction.</li> <li>▪ The Pink Route Option is likely to result in negative effects on the Special Qualities of the LLTNP and the local landscape character, the LLTNP core wildness areas, landscape elements and features, people at the Rest and Be Thankful viewpoint, walkers on the LLTNP core paths and hill walking trails and people travelling on the Old Military Road as a result of introducing the new carriageway, the tunnel and additional landslide protection works. This option would also have negative effects on the planned Rest and Be Thankful Woodland Creation Project. People travelling on the Argyll Coastal Route through a tunnel (1.6km long in Purple Route Option and 3km-long in Pink Route Option) would be entirely deprived of the opportunity to enjoy the unique scenery while those travelling through a debris flow shelter (Brown Route Option and potentially Green Route Option) would have their opportunities for enjoying the scenery along the route only partially hindered. The same receptors travelling on a viaduct (mostly Yellow Route Option, but to a lesser degree also Purple, Green and Brown Route Options) would benefit from the elevated position and be better placed for appreciating the scenic views.</li> <li>▪ The viaducts included as part of the Yellow (1.8km long), but also Brown (0.3km long), Green (0.3km and 0.2km long) and potentially Purple Route Option could result in significant landscape and visual effects, although, with careful design and mitigation the effect could be reduced or even made beneficial.</li> </ul>

- 9.2.4 Taking the key constraints summarised in Table 9.2 into consideration, the Purple Route Option appears to be the most constrained in terms of potential effects on environmental receptors and resources. In particular it may cause proportionally worse potential negative effects in terms of population and human health, use of materials, bedrock geology, peat, cultural heritage resource, and the views from the road experienced by travellers on the Argyll Coastal Route, than the other possible route options. However, it is considered that the Purple Route Option should not be discounted on environmental grounds and that careful design development has the potential to reduce or mitigate potential environmental effects to an extent, as well as present opportunities for positive environmental effects.
- 9.2.5 The Brown Route Option is considered to be the least constrained possible route option in terms of potential environmental effects. In particular, the Brown Route Option is considered to present fewer environmental constraints in terms of air quality, biodiversity, cultural heritage and landscape and visual effects.
- 9.2.6 Each of the five possible route options would require more detailed discussions with the Consultation Authorities and other ESG members to determine the most acceptable alignment and engineering solutions to comply with environmental regulations.
- 9.2.7 The SEA recommends that any of the five possible route options taken forward to DMRB Stage 2 should undergo further assessment, including field surveys where required, in order to explore the environmental effects and mitigation measures associated with each possible route option in more detail.

## **10. SEA Mitigation and Monitoring**

### **10.1 Proposed Mitigation, Enhancement and Monitoring Framework**

10.1.1 The intention of the mitigation, enhancement and monitoring measures listed in this SEA is to develop a project-level assessment framework and checklist to ensure that these measures are embedded and tested across each stage of project design and also carried through to the project construction stages. Further work on these measures will continue through the SEA public consultation period, for inclusion within the final monitoring framework, which will be included in the SEA Post-Adoption Statement.

### **10.2 Mitigation, Enhancement and Monitoring Recommendations**

10.2.1 Table 10.1 provides a preliminary framework based on the design development, mitigation and enhancement recommendations in the assessment of the SEA topics presented in Appendix C (Detailed Baseline and Assessment) and summarised in Chapter 7 (Environmental Constraints and Opportunities). It should be noted that this framework is an example only at this stage and may be subject to review following feedback from the public consultation process.

10.2.2 The framework will be updated to include any additional recommendations from the supporting strategic studies that are also being progressed, including the Habitats Regulations Appraisal and Natural Capital Assessment.

10.2.3 The final column of Table 10.1 is included to demonstrate that the framework could be used to record progress against recommendations at various stages throughout the project lifecycle.



Table 10.1: SEA Mitigation and Monitoring Framework

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
<b>Climatic Factors</b>				
The design of the project should seek to minimise material usage and the need for earthworks.	DMRB Stage 2 DMRB Stage 3 Detailed design	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
The choice of materials used to construct the project should consider where it can implement sustainably sourced and low carbon materials. Consideration should also be given to the location of suppliers to minimise transportation distances, subject to any procurement limitations.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and procurement and by contractor during construction.	n/a	
Opportunities for offsetting should be considered where appropriate to contribute towards the national legislative target of achieving net zero emissions.	Throughout the project lifecycle	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	n/a	
The design of the project should seek to avoid areas of nationally important peat (Class 1 and 2) where possible. Indirect impacts of the design on peat (for example a change in drainage) should be considered and mitigated.	DMRB Stage 2 DMRB Stage 3 Detailed design	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
The design of the project should seek to avoid areas of existing and future forestry to preserve carbon sequestration woodland.	DMRB Stage 2 DMRB Stage 3 Detailed design	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	n/a	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
<b>Air Quality</b>				
Adopt construction and traffic management methods which, as far as practicable, reduce dust and pollutant emissions. This information should be included in Construction Environmental Management Plans (CEMPs).	Construction	Contractor To be monitored through implementation of construction environmental management plans.	Consultation with Argyll and Bute Council and LLTNPA	
Explore integration of green infrastructure in project design (for example at the Rest and Be Thankful parking facilities)	DMRB Stage 2 DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	Consultation with Argyll and Bute Council and LLTNPA	
<b>Population and Human Health</b>				
Implementation of a communications strategy to keep local communities informed of the progress of the project and to provide channels for input/complaints/enquiries (e.g. telephone helpline, website, email, postal address etc).	DMRB Stage 2 DMRB Stage 3 Pre-construction Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	n/a	
Appointment of a community liaison officer to facilitate regular meetings with local communities to provide project updates and allow for feedback/input.	Pre-construction Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	n/a	
Early consultation with key stakeholders and active travel groups in order to develop active travel proposals to complement the project.	DMRB Stage 2 DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	n/a	
Regular consultation with outdoor/access officer, head of tourism and other relevant stakeholders within the LLTNPA to ensure that any effects on the normal operations of the Park during construction of the proposed project are minimised as far as practicable.	Pre-construction Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	Consultation with LLTNPA	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
Design for the protection / enhancement of green and open spaces.	DMRB Stage 2 DMRB Stage 3  Detailed design	Designer  To be monitored by Transport Scotland during subsequent DMRB stages.	n/a	
Ensure the project complies with the Equalities Act 2010, and considers mitigation and enhancements for protected characteristic groups in the project design, including the design of linkages to walking and cycling routes and core path networks.	DMRB Stage 2 DMRB Stage 3  Detailed design	Designer  To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
Design any permanent diversion in NMU routes to provide the same or improved standard of pathway.	DMRB Stage 2 DMRB Stage 3  Detailed design	Designer & Contractor  To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
Schedule and control the timing of construction activities to minimise noise impacts on sensitive receptors. This information is to be included in Construction Environmental Management Plans (CEMPs).	Construction	Contractor  To be monitored through implementation of construction environmental management plans.	Consultation with Argyll and Bute Council and LLTNPA	
Adopt construction and traffic management methods which, as far as practicable, maintain access for road users and NMUs during construction periods. This information is to be included in a Construction Traffic Management Plan.	Construction	Contractor  To be monitored through implementation of construction environmental management plans.	Consultation with Argyll and Bute Council and LLTNPA	
<b>Material Assets</b>				
The choice of materials used to construct the preferred route should consider where it can implement sustainably sourced and low carbon materials. Consideration should also be given to the location of suppliers to minimise transportation distances. This information should be included in design and CEMPs.	Throughout the project lifecycle	Designer & Contractor  To be monitored by Transport Scotland during procurement and by contractor during construction.	n/a	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
Produce a waste management strategy and ensure that the waste hierarchy is followed.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
The loss of woodland should be replaced through tailored planting mitigation.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with Local Authority, Loch Lomond & The Trossachs National Park Authority and NatureScot	
Appropriate notice and diversionary routes should be provided prior to construction to inform road users of disruption.	Pre-construction and during construction	Contractor To be monitored through implementation of construction environmental management plans.	Consultation with Argyll and Bute Council and LLTNPA	
<b>Biodiversity</b>				
Where feasible, the project should avoid sites designated for their biological interest, particularly sites of international and national importance.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with NatureScot	
Should the project require the loss of habitat from an internationally or nationally designated site, bespoke mitigation or compensation could be required. The specific details would be prepared at DMRB Stage 3.	DMRB Stage 3 Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with NatureScot	
The design of the project should seek to minimise overall land-take to reduce adverse impacts to biodiversity.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent	n/a	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
		DMRB stages and by contractor during design and construction.		
The project should seek to ensure permeability for wildlife. This could include, where appropriate, the provision of mammal crossings or fish passage through culverts.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
The principle of securing positive effects for biodiversity should be adopted, to ensure compliance with government policy, DMRB guidance and that functional ecosystems are maintained.	Throughout the project lifecycle Monitoring approach to be developed at DMRB Stage 3 but could include Biodiversity Metric 2.	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
The loss of woodland and other notable habitats should be replaced through tailored planting mitigation to ensure contiguousness of woodland.	DMRB Stage 3 Pre-construction Planting/regrowth would be monitored. Details to be developed at DMRB Stage 3.	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
A CEMP should be developed. This should include a Biosecurity Plan, an Ecological Management Plan and Species Management Plans as required.	DMRB Stage 3 Pre-construction Construction The plans would be refined and updated during the construction stage and finalised at the end of construction to support future management and operation	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and procurement, and by contractor's Ecological Clerk of Works (ECoW) on site during construction.	Consultation with NatureScot	
Schedule construction activities to reduce disturbance to species of conservation interest where practicable (e.g. seasonal restrictions or avoidance of works during the hours of darkness).  Compliance would be monitored by an Ecological Clerk of Works (ECoW) for the duration of works.	DMRB Stage 3 Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and procurement,	n/a	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
		and by contractor's ECoW on site during construction.		
<b>Water Environment</b>				
The design of the project 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.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	SEPA Monitoring requirements to be agreed with regulator.	
Prevent deterioration of the status of surface water bodies during construction through appropriate pollution control for all potentially polluting activities.	Construction	Contractor	SEPA Monitoring requirements to be agreed with regulator.	
Incorporate effective SuDS to avoid or reduce impacts on water quality, informed by landscape and ecology specialists, such that SuDS features deliver other enhancement benefits where feasible.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	SEPA NatureScot Monitoring requirements to be agreed with regulator.	
Channel modifications, in-channel works and temporary/ permanent structures should seek to limit effects on channel hydromorphology and be designed in accordance with appropriate standards and best practice. Where practicable efforts should seek to improve the current situation for surface water bodies with existing morphological pressures.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	SEPA Monitoring requirements to be agreed with regulator.	
Hydrogeology and geotechnical surveys should be undertaken to determine groundwater levels within the vicinity of the project. In excavation areas confirmed to intercept groundwater, potential effects should be assessed at later design stages.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	SEPA Monitoring requirements to be agreed with regulator.	
Design of tunnels should include a dewatering assessment if appropriate, to ensure long-term adverse effects on groundwater from dewatering are minimised.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	SEPA	
Where potential GWTDE have been identified through a review of habitat information in conjunction with ecologists at DMRB Stage 2 and 3, should be undertaken to improve understanding of hydrogeological context of habitats.	DMRB Stage 2, DMRB Stage 3	Designer	SEPA NatureScot	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
		To be monitored by Transport Scotland during subsequent DMRB stages.		
Site specific flood risk assessments should be undertaken in accordance with DMRB and other relevant guidance, as more localised detail becomes available at each relevant design stage.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	Argyll and Bute Council SEPA Monitoring requirements to be agreed with regulator.	
Seek to avoid new infrastructure in the functional floodplain. Where unavoidable, new infrastructure should be restricted to the shortest practical crossing, avoiding extensive construction within the functional floodplain and providing adequate compensatory flood storage areas where appropriate.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	Argyll and Bute Council SEPA Monitoring requirements to be agreed with regulator.	
Design of watercourse crossings should seek to cause no increase in flood risk to sensitive receptors and should improve upon the current situation where culverts have not been identified to have sufficient capacity for the design event.	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	Argyll and Bute Council SEPA Monitoring requirements to be agreed with regulator.	
Structures may require ongoing inspection and maintenance to prevent blockages. The design would seek to eliminate the need for operational interventions where possible. Requirements of monitoring to be determined at DMRB Stage 2 and 3.	Operation	BEAR	n/a Monitoring requirements to be agreed with regulator.	
Pre and post construction water quality monitoring may be required, where deemed necessary at further design stages. Requirements of monitoring to be determined at DMRB Stage 2 and 3.	Pre-construction, Operation	SEPA	SEPA Threshold triggers to be outlined at later design stages if monitoring is deemed necessary.	
During and post construction geomorphological monitoring may be undertaken where deemed necessary at further design stages. Requirements of monitoring to be determined at DMRB Stage 2 and 3.	Construction, Operation	SEPA	SEPA Monitoring requirements to be agreed with regulator.	

**Soils**

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
Peat and carbon-rich soils surveys should be undertaken during design development to inform baseline conditions and design development should seek to reduce the overall land-take of soils and peat and avoid soil sealing where possible.	DMRB Stage 2, DMRB Stage 3, Detailed Design	Designer To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	n/a	
Where soils or peat are unavoidably disturbed, mitigation should be considered which reduces organic matter loss, contamination, erosion risk, compaction/structural degradation and soil biodiversity is maintained.	DMRB Stage 2, DMRB Stage 3, Detailed Design, Construction	Designer & Contractor	n/a	
Design development should avoid areas of nationally important peat (Class 1 and 2) and limit loss of and disturbance to non-priority peat (Class 3, 4 and 5) and carbon-rich soils as far as practicable. Design development should limit indirect impacts on peat, for example a change in drainage, and mitigation should be developed.	DMRB Stage 2, DMRB Stage 3, Detailed Design	Designer	n/a	
Where areas of non-priority peat or carbon-rich soils cannot be avoided, mitigation measures should be considered where possible to safeguard peat and carbon-rich soils and measures should be detailed within a Peat Management Plan.	DMRB Stage 2, DMRB Stage 3, Detailed Design, Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with Local Authority, Loch Lomond & The Trossachs National Park Authority and NatureScot. Compliance with the Peat Management Plan should be monitored by a suitably qualified and experienced person	
Opportunities for peat habitat restoration, enhancement and creation should be explored where feasible and detailed within a Peat Management Plan.	DMRB Stage 2, DMRB Stage 3	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	Consultation with Local Authority, Loch Lomond & The Trossachs National Park Authority and NatureScot. Compliance with the Peat Management Plan should be monitored by a suitably qualified and experienced person.	



Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
Design development should aim to limit excavation and disturbance to the geology as far as practicable through, for example, optimising the cut/fill balance and re-use of site-won materials.	DMRB Stage 2, DMRB Stage 3, Detailed Design	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	n/a	
Design development should seek to avoid sites designated for their geological interest i.e. Geological Conservation Review (GCR) sites, where feasible.	DMRB Stage 2, DMRB Stage 3, Detailed Design	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	n/a	
<b>Cultural Heritage</b>				
Seek to develop road alignments that avoid direct impacts on cultural heritage resources or their setting, where feasible.	DMRB Stage 2 DMRB Stage 3 Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	Argyll and Bute Council (Listed Buildings)	
Develop cultural heritage design objectives for the project in accordance with national, regional and local policies, priorities and objectives <sup>17</sup> . The cultural heritage design objectives should: <ul style="list-style-type: none"> <li>consider undesignated cultural heritage resources in addition to designated resources;</li> <li>consider enhancement opportunities, such as improving sustainable access arrangements.</li> </ul> The cultural heritage design objectives should be included in the design and CEMPs.	DMRB Stage 2 DMRB Stage 3 Construction	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during construction.	Argyll and Bute Council, Historic Environment Scotland, Transport Scotland (as Overseeing Organisation)	
<b>Landscape and Visual Amenity</b>				
Develop a landscape strategy and design objectives which will help to integrate the road with the surrounding landscape and mitigate effects of the	DMRB Stage 2 DMRB Stage 3	Designer	Consultation with Loch Lomond and the Trossachs National Park	

<sup>17</sup> In accordance with DMRB LA 106 – Cultural heritage assessment. (Highways England, Scottish Government, Welsh Assembly Government and The Department for Infrastructure 2020g)

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
<p>project, and new large-scale structures in particular, on the nearby landscape and visual receptors through sympathetic, sensitive design, alignment, micro-siting and ongoing consultation with relevant stakeholders.</p> <p>Embed landscape mitigation in the design including careful route selection and alignment of the project, 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 woodland loss.</p>		To be monitored by Transport Scotland during subsequent DMRB stages.	Authority (LLTNPA), NatureScot, Argyll & Bute Council, Forestry and Land Scotland, Historic Environment Scotland	
Recognise, respect and protect the special landscape qualities of the National Park evident in the corridor and seek to avoid significant adverse effects on them and provide opportunities to experience them through careful design. Equally, identify any undesignated landscape elements and features of relatively high value and seek to protect them in the same manner	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot	
Minimise the loss of existing vegetation wherever practicable and in particular retain mature trees and woodland as well as 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 project. Consider not just quantity but also quality so that if a small area of mature trees needs to be felled to make space for the project ensure a larger area of young trees is planted so as to balance out the loss of structure and function provided by mature trees.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot, Argyll & Bute Council, Land & Forestry Scotland	
Collaborate with other relevant disciplines and perform regular design quality checks to ensure any prominent, elevated or vertical structures such as bridges, viaducts, tunnel portals, ventilation and escape shafts etc are designed to be aesthetically pleasing and/or visually unobtrusive to be in keeping with the local environment and avoid or reduce adverse effects on the landscape resource, including the landscape character and setting of any natural or cultural heritage assets, and the nearby visual receptors, including those travelling along the A83.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, Architecture & Design Scotland, NatureScot, Argyll & Bute Council, Forestry and Land Scotland, Historic Environment Scotland	
Ensure any the design of SuDS features considers opportunities for multi-functionality and delivers amenity and biodiversity benefits as well as	Throughout the project lifecycle	Designer & Contractor	Consultation with LLTNPA, NatureScot, SEPA	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
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.		To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.		
Take account of local species composition, forest and woodland strategies, climate change adaptation and biosecurity threats when developing planting proposals.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot, Forestry and Land Scotland	
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.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot, SEPA	
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 views from the road and provide good lines of sight to the stunning views of the iconic landscapes and high-quality stopping places along the route to take advantage of key views.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot, Argyll & Bute Council	
Consider the dark skies and perceived wildness of the local landscape and seek to avoid significant effects on them.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with LLTNPA, NatureScot	
Provide screen planting of the project, where appropriate, for nearby residential receptors which takes account of different seasons and times of day.	Throughout the project lifecycle	Designer & Contractor To be monitored by Transport Scotland during subsequent DMRB stages and by contractor during design and construction.	Consultation with Argyll & Bute Council, LLTNPA, NatureScot	
<b>Type 1 cumulative effects</b>				

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
<p><u>Population receptors</u></p> <p>The alignment of the preferred route option to be developed with cognisance of the potential for cumulative effects - from changes in noise and vibration, air quality, visual, access, tourism and recreation - on population receptors and should seek to avoid and reduce these where possible.</p>	Throughout the project lifecycle	Designer To be monitored by Transport Scotland throughout project lifecycle.	Consultation with ESG members, if required	
<p><u>Woodland/forestry, peat, LLTNP</u></p> <p>Monitoring potential cumulative effects on receptors/resources identified in the SEA throughout design development and adjusting design/mitigation measures accordingly.</p>	Throughout the project lifecycle	Designer To be monitored by Transport Scotland throughout project lifecycle.	Consultation with NatureScot, LLTNP, Argyll and Bute Council; and Scottish Forestry, if required	
<p><u>Species of conservation interest and habitats</u></p> <p>Potential cumulative effects on the species of conservation interest and habitats should be assessed in more depth by ecologists at DMRB Stages 2 and 3 with cognisance of the principle of securing positive effects for biodiversity and national goals in relation to biodiversity.</p>	DMRB Stage 2, DMRB Stage 3	Designer To be monitored by Transport Scotland during subsequent DMRB stages.	Consultation with NatureScot, LLTNP, Argyll and Bute Council; and Scottish Forestry, if required	
<p><u>Natural capital</u></p> <p>Ensure that natural capital and ecosystem services are assessed at each key project stage and measured against the scheme objective TPO5, and ensure that appropriate mitigation and enhancement is incorporated.</p>	Throughout the project lifecycle	Designer To be monitored by Transport Scotland throughout project lifecycle.	Consultation with ESG members, if required	
<b>Type 2 cumulative effects</b>				
<p><u>Climatic factors</u></p> <p>A review of lessons learned and good practice across the industry in relation to decarbonisation of construction is recommended, including appropriate training sessions.</p>	Throughout the project lifecycle	Designer To be monitored by Transport Scotland throughout project lifecycle.	Collaboration between Transport Scotland project managers	
<p><u>Population and human health</u></p> <p>A joint Traffic Management Plan for the A83 project and A82 Tarbet to Inverarnan to be developed by the respective contractors, should it be expected that construction phases would overlap.</p>	Pre-construction Construction	Designer & Contractor To be monitored by Transport Scotland during procurement and by the contractor during construction.	Collaboration between A83 project and A82 Tarbet to Inverarnan contractors	

Mitigation / Enhancement / Monitoring Measure	Stage of Implementation (e.g. DMRB Stage 2, DMRB Stage 3)	Responsible Party for Implementation / Monitoring of Measure	Consultation/ Approvals Required	Progress (to be completed at future stages)
<p><u>Material Assets</u></p> <p>A review of lessons learned and good practice across the industry in relation to decarbonisation of construction, including sustainable sourcing of materials and reducing waste, is recommended, including appropriate training sessions.</p>	Throughout the project lifecycle	<p>Designer</p> <p>To be monitored by Transport Scotland throughout project lifecycle.</p>	Collaboration between Transport Scotland project managers	
<p><u>Biodiversity</u></p> <ul style="list-style-type: none"> <li>▪ Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on the biodiversity from A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</li> <li>▪ Cognisance of the principle of securing positive effects for biodiversity and national goals in relation to biodiversity to be considered at all stages of the A83 project lifecycle.</li> <li>▪ Further study to be undertaken in consultation with NatureScot and LLTNP where relevant, to identify and quantify cumulative effects on species of conservation interest and habitat loss, where possible, as a result of major Transport Scotland infrastructure projects. Appropriate mitigation and monitoring measures would then be proposed to target significant effects on specific species/habitats.</li> </ul>	DMRB Stage 2 DMRB Stage 3	<p>Designer</p> <p>To be monitored by Transport Scotland during subsequent DMRB stages.</p>	Consultation with NatureScot, and LLTNP where relevant	
<p><u>Soils</u></p> <p>Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on soils from A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</p>	DMRB Stage 2 DMRB Stage 3	<p>Designer</p> <p>To be monitored by Transport Scotland during subsequent DMRB stages.</p>	n/a	
<p><u>Landscape and Visual Amenity</u></p> <p>Further assessment is required at subsequent DMRB stages to determine extent of potential cumulative effects on landscape receptors from the A83 project, A82 Tarbet to Inverarnan, and projects within the route corridor (OMR and Rest and Be Thankful improvements).</p>	DMRB Stage 2 DMRB Stage 3	<p>Designer</p> <p>To be monitored by Transport Scotland during subsequent DMRB stages.</p>	n/a	

## 11. Next Steps

### 11.1 Next Steps in the SEA Process

- 11.1.1 This Environmental Report has been prepared to support the consultation on the PES with the SEA Consultation Authorities, stakeholders and the general public. All comments received on this report will be considered and, where required, addressed prior to the commencement of the next stages of development for the preferred corridor.
- 11.1.2 On implementation of the actions recommended in this Environmental Report (see Chapter 10: SEA Mitigation and Monitoring) in the short term, the recommended mitigation and monitoring proposals will be put in place to ensure that the SEA influences the future implementation of the project to minimise adverse effects and maximise opportunities for environmental enhancements.
- 11.1.3 An SEA Post Adoption Statement will be published, advising where the public can view the draft PES Report (Jacobs/AECOM 2021b) and this Environmental Report. The SEA Post Adoption Statement is described in section 11.5.

### 11.2 Environmental Report Consultation

- 11.2.1 This Environmental Report will be consulted on for a period of eight weeks.
- 11.2.2 Comments on the Environmental Report can be provided by email to: [sinead.thom@transport.gov.scot](mailto:sinead.thom@transport.gov.scot) and [steve.isaac@jacobs.com](mailto:steve.isaac@jacobs.com); or by post to: Transport Scotland, Buchanan House, 58 Port Dundas Road, Glasgow, G4 0HF.
- 11.2.3 The SEA Scoping Report, Environmental Report and Post Adoption Statement will each be placed on Transport Scotland's website for public consultation. They will also be placed on Scotland's SEA Gateway website:

<https://www.gov.scot/policies/environmental-assessment/strategic-environmental-assessment-sea/>

### 11.3 Next Steps for Related Assessments

- 11.3.1 It will be necessary to undertake an HRA of the DMRB Stage 2 design to identify potential effects of the project on the conservation objectives of European/Ramsar sites. This would ensure that any changes during design development could not have an adverse effect on site integrity of these sites.
- 11.3.2 The Natural Capital Assessment will be progressed at DMRB Stage 2, following the approach described in Table 1.1.
- 11.3.3 As set out by the mitigation measures recommended in 'Population and Human Health', an EqIA of tunnel design will be undertaken at DMRB Stage 2 and again at DMRB Stage 3, if required. Subsequent assessments following DMRB guidance undertaken at Stages 2 and 3 will also include consideration of effects on accessibility and human health, with reference to effects on vulnerable groups, where relevant.

## **11.4 Consultation Feedback Review**

- 11.4.1 All consultation feedback received on this Environmental Report will be added to a table which will be included in the SEA Post Adoption Statement. This table will describe how each of the consultation comments has been addressed in the SEA and PES and how they have influenced their development.

## **11.5 SEA Post Adoption Statement and Finalised Monitoring Framework**

- 11.5.1 SEA Post Adoption Statements are intended to improve the transparency of the decision-making process within projects such as the Access to Argyll and Bute (A83).
- 11.5.2 The SEA Post-Adoption Statement will document:
- how environmental considerations have been integrated into the plan;
  - how the Environmental Report and consultation responses have been taken into account;
  - the reasons for choosing the project as adopted in light of other reasonable alternatives considered by the SEA; and
  - the measures to be taken to monitor the significant environmental effects of implementing the project.
- 11.5.3 A final mitigation, enhancement and monitoring framework, based on Table 10.1 but incorporating consultation feedback, will be included in the SEA Post Adoption Statement, which is expected to be published in Summer/ Autumn 2021.

## 12. Glossary of Terms

Term	Definition
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.
Ancient Woodland	Areas of land that appear as wooded on maps dated pre-1750 (in Scotland) and are considered likely to have been continuously wooded from this date.
Ancient Woodland Inventory	Aims to list all probable ancient semi-natural woodlands on a county basis together with those woodlands in other ancient categories of lesser woodland nature conservation interest.
Assessment	An umbrella term for description, analysis, and evaluation.
Authority area	The area administered by a local authority for example, District Council, City Council or Unitary Authority.
Annual average daily flow (AADF)	Annual average daily flow (AADF) is the number of vehicles estimated to pass a given point on the road in a 24 hour period on an average day in the year.
Baseline	The existing conditions which form the basis or start point of the environmental assessment
Bedrock	Hard rock that lies beneath a superficial cover of soils and sediments.
Biodiversity	Biological diversity, or richness of living organisms present in representative communities and populations.
Biodiversity Net Gain	Biodiversity Net Gain (BNG) is development that leaves biodiversity in a better state than before. It is an approach whereby developers work with local governments, landowners, wildlife organisations, and other stakeholders to minimise impacts and maximise outputs for biodiversity. (CIEEM 2019: <a href="https://cieem.net/wp-content/uploads/2019/06/Biodiversity-Net-Gain-in-Scotland-CIEEM-Scotland-Policy-Group.pdf">https://cieem.net/wp-content/uploads/2019/06/Biodiversity-Net-Gain-in-Scotland-CIEEM-Scotland-Policy-Group.pdf</a> ) 'Securing positive effects for biodiversity' is the terminology used in this Environmental Report for Biodiversity Net Gain, in alignment with NPF4.
Broadleaved woodland	An area of woodland with predominantly deciduous tree species (less than 10% coniferous trees in the canopy).
Buffer	A natural, undisturbed strip surrounding a development or land disturbance activity or bordering a stream or permanent water body.
Burn	A small stream.
Catchment	The area contributing flow to a point on a drainage system.
Community	Assemblage of interacting populations that occupy a given area.
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.
Coniferous woodland	An area of woodland with predominantly coniferous tree species (less than 10% deciduous trees in the canopy).
Conservation	Preservation or restoration of the natural environment and wildlife.
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
Contaminated land	Land in such condition by reason of substances on or under the land that significant harm is being caused, there is a significant possibility of such harm being caused or pollution of controlled water is being, or likely to be caused'.
Core Path	A right of way designated by a Local Authority as being of importance to maintain access and leisure provision.



Term	Definition
Cultural heritage resources	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
Culvert	A metal, wooden, plastic, or concrete conduit through which surface water can flow under or across roads.
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 effects Secondary effects
Earthworks	Works created through the moving of quantities of soil or unformed rock.
Ecological Clerk of Works (ECoW)	A qualified ecologist who supervises construction sites, ensuring that ecological impacts are avoided or reduced and that the law relating to protected species etc. is complied with.
Ecological receptors	Living organisms, habitats, or natural resources that could be impacted by the construction or operation of the project.
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
Environmental Steering Group	Stakeholder consultation group for the Access to Argyll and Bute (A83) project which meets regularly to discuss environmental issues relevant to the SEA and PES.
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.'
Floodplain	Land adjacent to a river, which is subject to regular flooding.
Flora	Referring to plants of a particular region or habitat.
Fluvial geomorphology	The study of landforms associated with river channels and the sediment processes which form them.
Footprint	The geographical extent of an ecological impact.
Foraging	Searching for food or provisions.
Fragmentation	Breaking up of an organisms habitat into smaller fragments that may vary in size.
Freshwater	Bodies of water such as ponds, lakes, rivers and streams containing low concentrations of dissolved salts and other total dissolved solids.
Geomorphology	The branch of geology concerned with the structure, origin and development of topographical features of the earth's crust.
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
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 geological processes that alter the layout of the physical environment over long periods of time, or through human activities, such as land conversion.

Term	Definition
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 an 'appropriate assessment' (AA). This is known as Habitats Regulations Appraisal (HRA).
Habitats Regulations Appraisal (HRA)	The process by which certain plans or projects are assessed which could affect the integrity of European sites. The report is used to inform an Appropriate Assessment (AA) under the requirements of the Habitats Directive.
Habitats Directive	EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Hydrogeology	Branch of geology dealing with occurrence, distribution, and effect of groundwater.
Hydrological	The exchange of water between the atmosphere, the land and the oceans.
Infrastructure Investment Plan (IIP)	Scottish Government document which sets out why we need to invest, how we invest and what strategic, large scale investments we intent to take forwards within each sector over the next 10 to 20 years.
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.
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 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 SNH
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.
Non-motorised users	Pedestrians, cyclists and equestrians.
Non-prime land	Agricultural land of Land Capability for Agriculture (LCA) classes 3.2 to 7.
Notable species	Species which are below Red Data Book species in terms of threat status.
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.
Phase 1 Habitat Survey	This identifies the different habitats that are contained within or make up a site, and the key plant species for each of those habitat types.
Phase 2 Habitat Survey	A detailed specialist survey or phytosociological (plant community) study of a habitat within a site. It may utilise analysis of sample vegetation plots (quadrats) following the UK National Vegetation Classification.
Plantation woodland	Woodland of any age that obviously originated from planting.
Platooning	In transportation 'platooning' refers to a group of vehicles being driven together, reducing the distance between them.
Potential Effect	The effect on an aspect of the environment that may occur in the absence of mitigation.

Term	Definition
Preliminary Assessment	An initial assessment considering 15 route corridors that emerged from the STPR2 and A83 consultations, with the objective of identifying if corridors can be removed from further consideration at this stage.
Preliminary Engineering Support Services (PES)	Design Manual for Roads and Bridges (DMRB) Stage 1 Assessment to identify a preferred corridor for access to Argyll and Bute.
Prime agricultural land	Agricultural land of Land Capability for Agriculture (LCA) classes 1, 2 and 3.1.
Priority habitat	Those which have been identified as being most threatened and requiring actions under the UK Biodiversity Action Plan.
Priority species	Those which have been identified as being most threatened and requiring actions under the UK Biodiversity Action Plan.
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.
Retention Pond	A wet area for temporarily storing water which delays its flow downstream. Includes some water quality benefits. Usually part of SuDS (drainage design).
River Basin District	The area of land and sea, made up of one or more river basins, together with the associated groundwater and coastal waters, identified by the Water Framework Directive as the main unit for the management of river basins.
River basin management plan	A plan setting out actions required within a river basin to achieve set environmental quality objectives, reviewed on a six-yearly basis.
Runoff	Water that flows over the ground surface to the drainage system. This occurs if the ground is impermeable or if permeable ground is saturated.
Salinity	The saltiness or dissolved salt content of a body of water.
Salmonid	Pertaining or belonging to the family Salmonidae (salmon, trout and charr).
Scheduled Monument (SM)	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
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.
Scottish Planning Policy (SPP)	A statement of Scottish Government policy on nationally important land use.
Scour	A depression or hole left when sediment is washed away from the bottom of a river.
Scrub	Vegetation dominated by locally native shrubs, usually less than 5m tall.
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.
Sediment	Material carried in particles by water or wind and deposited on the land surface or seabed.
Sedimentation	The deposition or accumulation of sediment.
Semi-natural woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.
Sett	The burrow system of badgers comprising a series of underground tunnels and chambers. There are several categories of sett including a main sett, annex sett, subsidiary sett and outlier sett.
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.

Term	Definition
Site compound	A secure area close to the construction site which provides full site services including storage for equipment, materials and fuel, offices and amenity areas.
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.
Strategic Transport Project Review (STPR)	A two-year review of the Scottish transport network being undertaken by Transport Scotland. It aims to identify and prioritise road, rail and other interventions of national significance, which will be taken forward to improve the network. Through selecting which transport projects of national significance should be progressed, the STPR would also affect regional and local transport networks.
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.
Water quality	The chemical and biological status of various parameters within the water column and their interactions, for example dissolved oxygen, indicator metals such as dissolved copper, or suspended solids (the movement of which is determined by hydrological process and forms geomorphological landforms).

## 13. List of Acronyms and Abbreviations

Acronym	Definition
AADF	Average Annual Daily Flow
APQ	Areas of Panoramic Quality
APR	Annual Progress Report
ATC	Automated Traffic Count
AWI	Ancient Woodland Inventory
BNG	Biodiversity Net Gain
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
EqIA	Equalities Impact Assessment
ESG	Environmental Steering Group
GCR	Geological Conservation Areas
GHGs	Greenhouse Gases
GIS	Geographic Information Systems
GDWTE	Groundwater Dependent Terrestrial Ecosystem
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Appraisal
ICIA	Island Communities Impact Assessment
ICR	Infrastructure Carbon Review
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Assessment
LCA	Land Capability for Agriculture
LCF	Land Capability for Forestry
LCT	Landscape Character Type
LDP	Local Development Plan
LLTNPA	Loch Lomond and The Trossachs National Park Authority
LMP	Land Management Plan
MPA	Marine protected area
NMU	Non-motorised users
NPF3	National Planning Framework 3
NRS	National Records of Scotland
NTDS	National Traffic Data System
NTS2	National Transport Strategy 2
NWSS	Native Woodland Survey of Scotland
PES	Preliminary Engineering Support Services

<b>Acronym</b>	<b>Definition</b>
PPS	Plans, Policies, Strategies
RAMP	Transport Scotland Road Asset management Plan
RBMP	River Basin Management Plans
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SIMD	Scottish Index of Multiple Deprivation
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Appraisal Guidance
STPR2	Strategic Transport Projects Review 2
SuDS	Sustainable Drainage Systems
UN	United Nations
WEWS	Water Environment Water Services
WFD	Water Framework Directive
WLA	Wild Land Areas

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