

Appendix 4.1

Strategic Environmental Design Principles

Transport Scotland

August 2018



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1. Strategic Environmental Design Principles

1.1. Introduction

- 1.1.1. One of the key outputs of the A9 Dualling Programme Strategic Environmental Assessmentⁱ was the development of a range of Strategic Environmental Design Principles. The Principles were developed in collaboration with SEPA, SNH, Historic Environment Scotland, Cairngorms National Park Authority, Perth and Kinross Council and The Highland Council, and the full list is provided below.
- 1.1.2. The Principles are intended to represent the aims of the A9 Dualling Programme, with respect to consistency in the delivery of an environmentally-led design process, and to highlight the issues that are of particular relevance to the A9 Dualling Programme.
- 1.1.3. They are not intended as a replacement for existing requirements or standards; instead, they are intended to be considered as a set of aims that all A9 Dualling projects will seek to meet.
- 1.1.4. It is accepted that not all Principles will be applicable or achievable in all situations, and that situations will arise where the aims of individual Principles will conflict. It is also recognised that the Principles will always require to be applied within the context of safety considerations and the development of design solutions which are appropriate to the full range of issues relevant to road projects. A range of factors need to be taken into account, including engineering feasibility; road safety; impacts on landowners; and constrained locations where impacts on multiple environmental sensitivities need to be balanced and the optimum solution may be a compromise.
- 1.1.5. The Principles will be applied within the context of the environmental impact mitigation hierarchy, with the primary approach being to use the flexibility available within early design stages to avoid an adverse impact before considering mechanisms available to reduce, offset or, as a last resort, provide compensation for adverse impacts.
- 1.1.6. Similarly, for situations where design solutions offer opportunities to deliver environmental benefit (e.g. improved drainage, ecological connectivity or access through mitigation embedded via design development), this will be clearly highlighted within environmental assessment documents.

1.2. List of Principles

- 1.2.1. A list of Strategic Environmental Design Principles is provided below in Tables 1.1 to 1.9.

ⁱ Transport Scotland (June 2013); A9 Dualling Programme Strategic Environmental Assessment.

Table 1.1: Strategic Environmental Design Principles - Landscape

Landscape	
L1	Respect for the distinctive local landscape character and qualities of the A9 corridor shall inform all aspects of the dualling process
L2	Ensure road alignment and design responds to the qualities and key characteristics of each landscape character area through which the route passes
L3	Whilst respecting the distinctive character and qualities of the landscape and places along the route, ensure a consistency of approach to design to reinforce the overall identity of the A9 between Perth and Inverness
L4	Enhance the views from the road to maximise the positive traveller experience Key views shall inform the siting of laybys, around appropriate opportunities to showcase natural and built heritage along the route
L5	Ensure potential construction and long term [25 years plus] landscape effects both inform the landscape design of the road
L6	Secure adequate land for integrated landscape solutions
L7	Design for low maintenance and to accommodate future change
L8	Use natural characteristics in design and encourage the use of sensitive and innovative methods to mitigate adverse environmental and visual effects to deliver appropriately balanced solutions
L9	Minimise the effect of the road on the experience of the wider landscape, including lighting and noise
L10	Minimise the landscape impacts of verge and boundary treatments, within the context of safety standard requirements
L11	Avoid, or reduce effects on, landscape features, retain and make best use of existing vegetation and re-use site won materials wherever possible
L12	Maintain and where possible enhance ecological and landscape connectivity and minimise fragmentation
L13	Protect species and habitats to support biodiversity, natural processes and LBAP targets
L14	Use locally native and characteristic plant species and species mixes
L15	Aim to ensure the enhanced reputation of the A9 as one of the world's great tourist routes, through landscapes of national and international importance

Table 1.2: Strategic Environmental Design Principles - Biodiversity, Flora and Fauna

Biodiversity, Flora and Fauna	
B1	Avoid adverse effects on protected sites, habitats, species and sensitive areas of conservation importance
B2	Avoid land take from designated sites
B3	Embed the concept of no net loss of biodiversity Offset any reduction in high value habitat (temporary or permanent) by providing for the creation of an equal or greater amount of high value habitat

Biodiversity, Flora and Fauna	
B4	Embed the design concept of 'multi-species benefits through route permeability' to reduce barrier effects and collision risks for wildlife
B5	Incorporate verge treatments that use unpalatable seed mixes to reduce the attractiveness of roadside vegetation to mobile species
B6	Avoid the use of deer fencing unless currently provided for land management or to reduce collision risk
B7	Where deer fencing is required, use appropriate design of fence marking to minimise impacts on sensitive species e.g. birds
B8	Minimise light spillage
B9	Prevent the introduction or spread of Invasive Non-Native Species

Table 1.3: Strategic Environmental Design Principles - Woodland

Woodland	
Wd1	Avoid loss of woodland functionality (connectivity) at a landscape scale
Wd2	Avoid loss, damage, or fragmentation of ancient woodland inventory (AWI) sites
Wd3	Restrict woodland edge clearance and include woodland edge effects in the calculation of compensatory habitat requirements
Wd4	Compensation for ancient woodland losses should be of a scale, nature and location which is capable of delivering the woodland functionality being lost
Wd5	Veteran trees and significant landscape trees should be identified and safeguarded, where possible
Wd6	Avoid tree planting on road side verges to limit opportunities for shelter

Table 1.4: Strategic Environmental Design Principles - Soils and Geodiversity

Soils and Geodiversity	
S1	Avoid sites designated for their geological or geomorphological interest. Where unavoidable, ensure sympathetic design results in exposures of equal or better quality
S2	Avoid obscuring rock formations and exposures
S3	Avoid the use of mesh and vegetation on rock exposures
S4	Avoid disturbance of rare soils, high carbon, peat and wetland soils and productive agricultural land Where unavoidable, maintain on-site and off-site natural hydrological processes and ecological regimes within the soil
S5	Maximise re-use of appropriate soils (type/ pH/ location) through sustainable soil management in cut and fill balancing and landscaping to maintain soil biodiversity

Soils and Geodiversity	
S6	Ensure soils are appropriately considered in site/ habitat restoration plans – avoid transfers of inappropriate soil types and non-native invasive species

Table 1.5: Strategic Environmental Design Principles - Historic Environment

Historic Environment	
H1	Avoid impacts on the site and setting of heritage assets including scheduled monuments, historic buildings/townscape, designed landscapes and unscheduled archaeological features
H2	Ensure effective consideration of heritage assets, including their archaeological potential and landscape contexts Avoid and minimise effects which may impact archaeological potential, landscape context or interpretation
H3	Seek opportunities to improve access to the historic environment, including signage and interpretation
H4	Ensure appropriate use of materials that reflect local historic character for heritage assets Ensure boundary treatments in Gardens & Designed Landscapes are of high quality materials, applied appropriately and consistently

Table 1.6: Strategic Environmental Design Principles - Water, Flooding and SuDS

Water, Flooding and SuDS	
W1	Avoid locating the A9 and any associated works within the functional floodplain. Where this is not possible, the A9 should: <ul style="list-style-type: none"> • remain operational and safe for users during times of flood; • result in no loss of floodplain storage; and • the movement of water should not be impeded and flood risk should not be increased elsewhere.
W2	Avoid developing SuDS in the functional floodplain. Where this is unavoidable they should not be inundated up to the 1 in 30 year event and compensatory storage should be provided for all loss of capacity up to the 1 in 200 year event
W3	Ensure a minimum of two levels of road surface runoff treatment during construction and operation of the road via SuDS appropriate to the local landscape. Water discharged from SuDS should not result in the deterioration of water quality or hydrogeomorphological effects in the receiving watercourse.
W4	Avoid works within watercourses and lochs. Where such works are unavoidable then these should minimise impacts upon hydrogeomorphology, fish and mammal passage and flood risk. Extensions or replacements to existing watercourse crossings should seek opportunities for ecological enhancement.

Water, Flooding and SuDS	
	Watercourse diversion should be a last resort
W5	Avoid Groundwater Dependant Terrestrial Ecosystems Where these are unavoidable suitable mitigation should be implemented in consultation with SEPA and SNH
W6	Avoid cuttings that would result in dewatering and abstractions from watercourses, lochs or groundwater
W7	Ensure an effective buffer between the route alignment and river corridors to allow space for natural river processes, including consideration of climate change

Table 1.7: Strategic Environmental Design Principles - Material Assets

Material Assets	
M1	Ensure final designs minimise land take
M2	Maximise the use of existing route infrastructure with suitable residual performance life
M3	Minimise use of raw materials, through use of appropriate recycled materials that meet safety and durability performance requirements
M4	Minimise waste generation through re-use of excavated materials locally, or between A9 dualling schemes (subject to agreement with SEPA)
M5	Use long-life performance materials to improve durability and reduce whole life cost and carbon
M6	Use locally sourced materials and suppliers, to reduce material transport emissions and to support local businesses
M7	Assess the effect of recycled material specifications to determine the associated carbon impact and maintain flexibility to select the option that provides the optimal balance between embodied and transportation carbon effects

Table 1.8: Strategic Environmental Design Principles - Population and Human Health

Population and Human Health	
P1	Continue to facilitate opportunities to access visitor attractions and recreational opportunities throughout the corridor
P2	Retain, and where possible enhance, overall connectivity between non-motorised user (NMU) routes along and across the corridor
P3	Incorporate effective rationalisation between NMU routes, safe crossing points and provisions for access to public transport
P4	Ensure rationalisation of NMU routes and safe crossing points minimises the distance between crossings
P5	Design any permanent diversions in NMU routes to provide the same, or improved, standard of pathway
P6	Employ a preference for underpass crossings, where feasible, to minimise landscape and visual impacts

Population and Human Health	
P7	Consider the safety and quality of experience for non-motorised users of local roads when vehicle access to the A9 is being rationalised (e.g. the potential for traffic increases on the cycle route network)

Table 1.9: Strategic Environmental Design Principles - Cycling Principles

Cycling Principles	
C1	No particular requirement for National Cycle Network (NCN) route to run alongside the A9 mainline
C2	Cycle facilities to continue to pass through the centres of populated areas, where practical
C3	Cycle provisions, to relevant standards, to be considered in the design of grade separated junctions, side road and access diversions
C4	Extent of diversions to be minimised where cyclist crossing points are rationalised Any permanent diversions should be designed to provide the same, or improved, standard of cycle facility
C5	Cycle connections to public transport facilities to be maintained and improved, to relevant standards
C6	Provide vehicular access for maintenance of cycle facilities
C7	Consider opportunities to widen narrow sections of NCN, adjacent to the A9 mainline, in accordance with relevant standards
C8	Should A9 dualling propose local offline solutions, use of the existing A9 carriageway as a cycle route is to be assessed
C9	NCN route signage to be improved and rationalised where practical, to encourage users away from the A9, e.g. at House of Bruar and Wades Bridge, Dalwhinnie
C10	Level of usage of existing cycle facilities to be considered, in addition to desire lines
C11	Proposed NCN facilities to be assessed for their environmental, engineering and economic advantages and disadvantages
C12	Proposed NCN facilities to be assessed for their compliancy with the relevant Disability Discrimination Act (DDA) guidelines
C13	Opportunities to provide access to/ from existing cycle routes and identified viewpoint locations and layby(s) should be assessed
C14	Potential increases in side road traffic to be addressed in the Construction Contract Documents