12 Landscape

This chapter presents the assessment of impacts of the proposed scheme on the surrounding landscape. Central to the study area, the Firth of Forth is a maritime landscape of intertidal shores, islands and harbours where the prevailing weather and light conditions provide a dramatic setting for the iconic Forth Road Bridge and Forth Rail Bridge. To the north, the landscape of Fife's coastal terrace is dominated by settlement, industry and infrastructure, which cuts through the steep wooded cliffs and braes. South of the Firth of Forth, the historic town of South Queensferry is surrounded by arable farmland and the wooded estates of Dalmeny, Hopetoun and Dundas. The sensitivity of the Firth of Forth and the estates around South Queensferry is high, with lower landscape sensitivity for the developed land in Fife.

Aesthetics are a major consideration in the design of the Main Crossing, which would be the most prominent element of the proposed scheme and feature as an additional structure in both the local and wider landscape. Elsewhere, mitigation to ensure continuity and enhance the experience of the road user includes integration of the alignment and earthworks with the surrounding topography, formation of new rock cuttings to achieve a natural appearance, provision of false cuttings, replacement stone walls and noise barriers and planting mixed or scrub woodland, hedges and standard trees to reflect existing boundaries and/or provide screening.

Opinions will differ as to whether the Main Crossing would complement or detract from the familiar setting of the Forth Road Bridge and Forth Rail Bridge. Residual impacts for the Firth of Forth were therefore assessed as neutral and of Moderate to Substantial significance and impacts for North Queensferry were also considered to be neutral and of Moderate significance.

North of the Firth of Forth, residual impacts would be of Substantial significance for Ferry Hills, and Moderate to Substantial significance for North Queensferry Coastal Flat.

South of the Firth of Forth, impacts for South Queensferry, Duddingston and Dundas would be Moderate or Moderate to Substantial significance. Elsewhere, residual impacts would not be significant.

12.1 Introduction

12.1.1 This chapter presents the assessment of the proposed scheme in terms of impacts on the surrounding landscape. The chapter is supported by the following appendices, which are cross-referenced in the text where relevant:

- Appendix A12.1: Landscape Character, Sensitivity, Magnitude and Impacts; and
- Appendix A12.2: Extracts from SNH Landscape Character Assessments.

12.1.2 The assessment methodology is explained, baseline conditions are described and an assessment is made of the impacts on the landscape resource that would result from the proposed scheme. This includes an assessment of the changes in the character, quality and physical fabric of the landscape (including settlement areas) which are likely to occur. Mitigation measures are then described and the residual impacts are assessed.

12.1.3 Background information on the landscape character assessment is contained in Appendix A12.1. This includes a summary of the landscape character and the basis for the evaluation/assessment of landscape sensitivity and the magnitude of residual impacts.

12.1.4 The landscape assessment is primarily concerned with:

- impacts on specific landscape features and elements;
- effects on the overall pattern of elements which together determine the landscape character and local or regional distinctiveness;
- impacts on special interests or values such as designated landscapes, conservation sites and cultural associations; and
- changes to perceived characteristics of the landscape such as tranquillity and remoteness.

12.1.5 The assessment includes consideration of impacts from the addition of the Main Crossing to the landscape setting of the iconic Forth Road Bridge and Forth Rail Bridge.

12.1.6 The assessment also includes consideration of landscape impacts from the introduction of Intelligent Transport System (ITS), and night-time lighting of the proposed scheme based on currently available information. Further details of ITS and lighting are contained in Chapter 4 (The Proposed Scheme), paragraphs 4.6.25 to 4.6.29 and Chapter 13 (Visual), paragraphs 13.2.28 and paragraph 13.5.6 to 13.5.9.

12.1.7 Impacts assessed as being of Moderate or greater significance are considered to represent significant changes to the fabric, character and quality of the landscape and mitigation would generally be required to reduce these where practicable.

12.1.8 Further considerations related to landscape assessment are addressed separately as follows:

- Chapter 13 (Visual): impacts on the character of views and visual amenity;
- Chapter 18 (Vehicle Travellers): assessment of the views from the proposed scheme, as they would be experienced by vehicle travellers; and
- Chapter 19 (Disruption Due to Construction): landscape impacts during construction.

12.2 Approach and Methods

Study Area

12.2.1 The indicative study area for the assessment is represented by the Local Landscape Character Areas (LLCAs) identified as likely to be potentially affected by significant impacts from the proposed scheme. The identified LLCAs, shown on Figure 12.1, occupy the land approximately 3km either side of the proposed scheme, based on professional judgement that beyond 3km, indirect landscape impacts would be negligible due to topography and distance.

12.2.2 The assessment also includes consideration of landscape impacts from the introduction of Intelligent Transport System (ITS) gantries designed to improve traffic flow, and night-time lighting of the carriageway based on a worst-case scenario of this being required throughout the proposed scheme and also outwith the highway works on existing sections of the M90 between Admiralty Junction and Halbeath and on the M9 Spur. The assessment of these elements is based on indicative locations of gantries and lighting, and was undertaken for a wider study area as shown on Figure 12.1a. Impacts from the ITS gantries and associated maintenance lay-bys north of Admiralty are considered unlikely to represent a discernible change in character to the surrounding landscape of the M90 and would be limited exclusively to the area within the existing highway boundary. For this reason, the indicative study area north of Admiralty Junction is only represented by the Existing Road Corridor LLCA.

12.2.3 The landscape assessment was undertaken in accordance with DMRB (Highways Agency et al., 1993), Landscape & Visual Assessment and Supplementary Guidance (Scottish Executive, 2002) and Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Management & Assessment, 2002). The methodology described in this section was developed in consultation with SNH.

12.2.4 The initial stage of landscape assessment involved the collection of baseline data relating to the individual elements and characteristics of the landscape.

12.2.5 SNH commissioned two Landscape Character Assessments covering the study area, namely Fife Landscape Character Assessment (FLCA; SNH, 1999) and The Lothians Landscape Character Assessment (TLLCA; SNH, 1998). These were used as the basis for the landscape character assessment. These documents divide the study area into various Landscape Character Areas (LCAs) of particular Landscape Character Type (LCT). Detailed desk based and field assessment were undertaken to allow the boundaries of LCAs to be refined and considered at a more local scale. This provided a level of detail that enabled the evaluation of sensitivity and impact assessment. In some cases, this has meant the subdivision of land which is identified in the SNH assessments as being of a single LCT or LCA into smaller scale units, or Local Landscape Character Areas (LLCAs) to better reflect local variations in character. These are illustrated on Figure 12.1.

12.2.6 The information provided in the FLCA and TLLCA was supplemented by data collected through both desk based study and field assessment as outlined below. As the landscape and visual impact assessments are closely related, the data collected were used for both as appropriate.

12.2.7 Aesthetics are a major consideration in the design of the proposed scheme, particularly for the Main Crossing. However, opinions will differ as to whether the Main Crossing would contribute positively to this world-famous landscape, or detract from the familiar setting of the iconic Forth Road Bridge and Forth Rail Bridge. For this reason, the presence of the Main Crossing was not assessed as beneficial or adverse but as neutral, with the significance of change noted.

12.2.8 However, direct landscape impacts of the Main Crossing, such as loss of or disruption to important features, were more likely to result in adverse impacts upon the landscape and were assessed accordingly. Indirect (neutral) impacts were also assessed to identify the overall impact on the surrounding LLCA.

12.2.9 As agreed with SNH and in order to address the issues detailed above in paragraphs 12.2.7 and 12.2.8, separate assessments to determine the landscape impacts from elements of the proposed scheme were undertaken as follows:

- Main Crossing;
- Northern Route; and
- Southern Route.

Baseline Conditions

Desk Study

12.2.10 The desk study entailed the following:

- a review of Structure and Local Plans (refer to references section) and aerial photographs of the study area was conducted, and current 1:25,000 scale and 1:50,000 scale Ordnance Survey (OS) maps were studied to help identify the presence of areas of statutory designation and protection, landscape elements and patterns;
- an examination of data relating to landscape, archaeology, ecology, buildings and settlements was undertaken to provide a thorough knowledge of conservation interests. Other human interests were established by analysing data relating to recreation and public rights of way;
- baseline data contained in the Scottish Transport Appraisal Guidance (STAG) assessment for the Forth Replacement Crossing Study and Strategic Environmental Assessment (SEA) (Jacobs, Faber Maunsell, Grant Thornton and Tribal Consulting, 2006-2007) were utilised where relevant and the Setting Forth Environmental Statement (ERM, 1996) was also used to provide background information;
- data related to built-up areas, identified simply as 'Urban' in the FLCA were gathered in order to provide a meaningful baseline against which to assess potential impacts on their character and setting, (for example through noise and visual impacts); and
- consultations with statutory and other bodies as discussed in Chapter 6 (Consultation and Scoping) to supplement the desk study data collection.

12.2.11 Information of relevance to the proposed scheme was extracted from these sources and the following topics were explored:

- pattern and scale of landform, land cover and built development;
- special values including national and local landscape designations, Conservation Areas and historical and cultural associations; and
- specific potential receptors of landscape impact, including important elements of the landscape, as well as residents, visitors and travellers.

Field Survey

12.2.12 The study area was visited to conduct an up-to-date field survey that included identification of specific landscape constraints and verification/supplementation of data collected in the desk assessment.

12.2.13 The field surveys, undertaken between October 2008 and May 2009, were carried out by car and by site walkovers from the surrounding minor roads, tracks and footpaths by teams of at least two landscape architects.

12.2.14 Observation of the levels of public use of open spaces, roads and footpaths was made in the field and used to assist in the assessment. Further information on public usage of footpaths, cycle paths and bridleways is contained in Chapter 17 (Pedestrians, Cyclists, Equestrians and Community Effects).

Sensitivity to Change

12.2.15 Once the LLCAs were identified, the sensitivity of each area to change as a result of the proposed scheme was assessed. In accordance with Landscape & Visual Assessment Supplementary Guidance (Scottish Executive, 2002), evaluation of sensitivity to change combines a review of 'susceptibility' (i.e. the vulnerability of the area to change arising from the proposed scheme) and 'value', as applied to the main elements of the landscape. Susceptibility and value take into account information about the various factors considered in arriving at the sensitivity evaluation, such as key features and characteristics, quality and value/importance, which together create a sense of place. The evaluation of sensitivity of landscape and settlement character areas away from the proposed scheme, but where people's experience of these could be altered by the proposals (for example through indirect landscape impacts or increases in traffic noise affecting their setting) focuses primarily on perceptual qualities such as remoteness, tranquillity and visible landscape impacts. Table 12.1 below outlines the criteria used to define the overall evaluation of landscape sensitivity. Where appropriate the intermediate categories of low to medium and medium to high sensitivity were also used in the assessment.

Table 12.1: Landscape Sensitivity Criteria

Sensitivity	Criteria
High	Landscape or landscape elements of particular distinctive character, highly valued and considered susceptible to relatively small changes.
Medium	A landscape of moderately valued characteristics considered reasonably tolerant of change.
Low	A landscape of generally low valued characteristics considered potentially tolerant of substantial change.

Impact Assessment

Magnitude of Change

12.2.16 Evaluation of the magnitude of the proposed changes upon the landscape involved a review of the nature and scale of the changes, together with the duration and degree of permanence using the criteria outlined below in Table 12.2. Where appropriate, intermediate categories of low to medium, and medium to high, were also used in the assessment.

Table 12.2: Landscape Magnitude of Change Criteria

Magnitude	Criteria
High	Notable change in landscape characteristics over an extensive area ranging to very intensive change over a more limited area.
Medium	Minor changes in landscape characteristics over a wide area ranging to notable changes in a more limited area.
Low	Minor or virtually imperceptible change in any area or landscape components.

Impact Significance

12.2.17 A scale ranging from Negligible to Severe (or Major*) impact significance was used in the assessment. An initial indication of impact significance was obtained by combining the sensitivity to change and magnitude of change assessments using the framework shown below in Table 12.3. Where appropriate, intermediate categories of Slight to Moderate and Moderate to Substantial were also used in the assessment.

Table 12.3: Landscape Impact Significance

Magnitude / Sensitivity	Low	Medium	High
High	Moderate	Substantial	Severe*
Medium	Slight	Moderate	Substantial
Low	Negligible	Slight	Moderate

* Note: for neutral impacts of the Main Crossing and beneficial impacts, the 'severe' category was replaced by 'major'.

12.2.18 As stated in paragraph 12.1.7, Moderate or greater adverse impacts were considered to represent key landscape changes and mitigation would generally be required to reduce these where practicable.

12.2.19 It should be noted that the matrix provided in Table 12.3 provides an initial guide and the significance assigned may be adjusted using professional judgement.

12.2.20 For consistency with other chapters of the ES, impacts reported in this assessment are considered adverse unless otherwise stated. The neutral (indirect) impacts of the Main Crossing as assessed using the approach explained in paragraphs 12.2.7 and 12.2.8 were also assessed using Table 12.3.

Limitations to Assessment

12.2.21 The locations of the proposed lighting and gantries with associated maintenance lay-bys were assessed both as elements of the proposed scheme and outwith the highway works for the proposed scheme on existing sections of the M90 between Admiralty and Halbeath and the M9 Spur, were based on indicative locations available at the time of completing this assessment. These locations would be subject to design development to refine the extent of lighting and number of gantries to reduce environmental impacts where practicable without compromising safety. A precautionary approach was therefore undertaken, assuming the likely maximum number of gantries.

12.3 Baseline Conditions

12.3.1 This section classifies and evaluates the landscape resource of the study area, taking account of the geological, cultural and historical influences as well as identifying any designated or protected areas.

Regional Context

12.3.2 The study area is located in the broad Midland Valley, which lies between the Grampian Hills and the Southern Uplands and is dominated by the Firth of Forth.

12.3.3 Central to the study area, the Firth of Forth is a maritime landscape of intertidal shores, islands and harbours where the prevailing weather and light conditions provide a dramatic and world-famous setting for the Forth Road Bridge and Forth Rail Bridge.

12.3.4 To the north of the Firth of Forth, the lowland and upland landscape is characterised by hills, valleys and Fife's coastal terrace, where settlement, industry and infrastructure prevail and cut through the steep wooded cliffs and braes.

12.3.5 Lothian's lowland plains and hills, south of the Firth of Forth, form an undulating agricultural landscape, where the historic town of South Queensferry is surrounded by arable farmland and the wooded estates of Dalmeny, Hopetoun and Dundas.

Landscape and Other Relevant Designations

12.3.6 The level of protection afforded to sites of landscape value and importance varies according to their designation as described below.

Nationally Protected Sites

Historic Landscapes and Designed Gardens

12.3.7 Within the study area there are a number of sites included on the Inventory of Gardens and Designed Landscapes designated by Historic Scotland and SNH. These are illustrated on Figure 12.1.

12.3.8 The following Gardens and Designed Landscapes are located within or close to the Northern and Southern study areas:

- Fordell Castle;
- Donibristle;
- Hopetoun;
- Dundas;
- St Colm;
- Dalmeny; and
- Newliston.

Locally Protected Areas

Area of Outstanding Landscape Quality –City of Edinburgh Council

12.3.9 An Area of Outstanding Landscape Quality (AOLQ), designated by the Rural West Edinburgh Local Plan (RWELP) (City of Edinburgh Council, 2005), is located within the southern study area at Humbie Reservoir as shown on Figure 12.1c and 12.1d.

Area of Great Landscape Value – West Lothian Council

12.3.10 The West Lothian Local Plan (WLLP) (West Lothian Council, 2009) identifies an AGLV along the shore of the Firth of Forth between Blackness and South Queensferry, including the managed woodlands of Hopetoun House and the setting of several other historic buildings surrounding the Hopetoun Estate. This AGLV is located within the southern study area as shown on Figure 12.1c.

Green Belt – City of Edinburgh Council

12.3.11 Green Belt, identified in the RWELP and in Edinburgh and Lothians Structure Plan (ELSB) (City of Edinburgh Council, 2004), features in the southern study area as shown on Figure 6.2b.

Protection of Open Space – City of Edinburgh Council

12.3.12 RWELP outlines policy for the protection of public and private open space of recreational, amenity or nature conservation value.

12.3.13 There are several areas of open space, as defined above, within the southern study area as shown on Figure 6.2b.

Candidate Special Landscape Areas – Fife Council

12.3.14 Fife Council has identified several candidate Special Landscape Areas (cSLA) in the draft Local Plan, which will be designated for their scenic quality, enjoyment, rarity and views. These cSLAs will replace the existing Areas of Great Landscape Value (AGLVs), none of which occur in the study area, when the new Fife Local Plans are adopted. At the time of writing, the status of AGLVs remained unchanged.

12.3.15 The following cSLAs occur within the study area and are shown on Figure 12.1:

- Letham Hill;
- Ferry Hill;
- Inchcolm Island, Firth of Forth; and
- Cullaloe Hills and Coast, north of Inverkeithing.

Tree Preservation Orders

12.3.16 A Tree Preservation Order (TPO) is made by a local planning authority to protect specific trees or a particular area, group or woodland from deliberate damage and destruction. TPOs can prevent the felling, lopping, topping, uprooting or otherwise willful damaging of trees without permission.

12.3.17 There are several TPO areas in the northern study area:

- North Queensferry – woodland south of Ferry Loch;
- Rosyth – woodland around the dovecot, north of the castle;
- Rosyth – 'The Wilderness' north of the town;
- Rosyth – trees surrounding dwellings at Wemyss Court;
- Letham – Letham Hill Wood; and
- Dalgety Bay – small group of trees east of railway station.

12.3.18 There are three TPO areas in the southern study area:

- Dalmeny – single tree immediately north of the A90 on Standingstane Road;
- South Queensferry – block of trees to the east of St. Margaret's Primary School; and
- Kirkliston – woodland surrounding dwelling on Manse Road.

Geology and Soils

12.3.19 The study area lies within the ancient rift Midland Valley between the Highland Boundary Fault line and the Southern Uplands fault line. The geology here comprises mainly carboniferous sedimentary rock, with dolerite igneous rock, which features in large outcrops around North Queensferry and Rosyth and is quarried beside Inverkeithing.

12.3.20 The majority of soils are derived from a 'drift' of compact sandy or clay tills deposited during glacial times. Glacial activity in the area also provided fluvio-glacial deposits consisting mainly of sand and gravel.

12.3.21 Further details are provided in Chapter 8 (Geology, Contaminated Land and Groundwater).

Landform and Drainage

12.3.22 The landform in the northern study area includes a flat coastal area, minor hills, gently undulating slopes, steeper coastal braes and inland valleys. The major hills in the area include the Ferry Hills at North Queensferry, Whinny Hill/Castlandhill to the west of Inverkeithing, Letham Hill to the west of Dalgety Bay and Clinthill Top to the north of Dalgety Bay. Ridge lines occur in several places in a roughly east-west formation along the south facing slopes.

12.3.23 The Firth of Forth is the main waterway in the area and flows from the Grampian Mountains in the west to the North Sea in the east with several rivers discharging into it along its length. In the north, the generally south facing slopes drain southwards into the Firth of Forth. Within the study area there are several burns that converge at Inverkeithing and discharge into Inverkeithing Bay and the Firth of Forth.

12.3.24 In the southern study area, burns along the north facing slopes (north of the ridge line) discharge northwards into the Firth of Forth; the main example of Midhope Burn is situated on the Hopetoun Estate. South facing slopes form the catchment for the River Almond which discharges into the Firth of Forth at Cramond to the east of the study area.

12.3.25 Further details are provided in Chapter 9 (Water Environment) and the drainage of the study area is illustrated on Figures 9.1 and 9.2.

Historical Account

12.3.26 The earliest recorded indication of settlement in the study area is from the Bronze Age and in the vicinity of both North and South Queensferry.

12.3.27 The name 'Queensferry' originated in 1070 from the ferry provided for Queen Margaret of Scotland, and future pilgrims, to reach Dunfermline Abbey, which she established at this time.

12.3.28 South Queensferry was a prosperous port until the 17th century, and in 1627 the town was elected a Royal Burgh and Freeport by Charles I. The town's prosperity then declined until the construction of the Forth Rail Bridge in 1883 regenerated both North and South Queensferry. The Royal Navy base, established at Port Edgar during the First World War, also brought increased prosperity to the area.

12.3.29 From the 13th century, large country homes and estates were developed beside the Firth of Forth. To the north, Fordell Castle Estate was given to a prominent family by King James IV in 1511, while south of the river, Hopetoun House dates back to the 17th century and Dalmeny House replaced the 13th century Barnbougle Castle in 1817. There is also a Gothic mansion on Dundas Estate, built in 1424.

12.3.30 Further south, near Winchburgh, shale was mined from the mid-1800s to the 1950s to produce paraffin. Large deposits of shale waste, known as 'bings' remain from this industry as a distinctive feature of the local landscape.

12.3.31 Despite the provision of the Forth Rail Bridge, demand for the ferry persisted to reflect the greatly increased use of cars and in 1964 the Forth Road Bridge replaced the ferry.

12.3.32 Today, both North and South Queensferry are popular commuter locations and tourist attractions.

Settlement and Land Use

12.3.33 Settlements located in the study area are briefly described below, with more detailed descriptions provided in Appendix A12.1.

12.3.34 In the northern study area, the settlements of North Queensferry, Inverkeithing, Dalgety Bay and Rosyth are located along the south facing coastal landscape overlooking the Firth of Forth.

12.3.35 North Queensferry is a small historic town with many listed buildings and is dominated by the Forth Road Bridge and Forth Rail Bridge structures.

12.3.36 Inverkeithing features mainly modern development around an inland bay, where industry once prevailed, and Dalgety Bay and Rosyth are also characterised by housing built in the 20th Century.

12.3.37 The main settlement in the southern study area is the town of South Queensferry, the history of which is briefly described in paragraphs 12.3.27 and 12.2.28. The town centre, closest to the shore, is a conservation area with several listed buildings. Impressive views of the Forth Road Bridge and Forth Rail Bridge influence the character of South Queensferry and the small settlement of Newton, located further west.

12.3.38 To the southeast of the southern study area, Kirkliston also has a conservation area, surrounded by more recent development.

12.3.39 Outwith the main settlement areas there are numerous dwellings, farmsteads and estates, as detailed in paragraph 12.3.29. The estates influenced the local land use by providing large wooded and designed landscapes and productive farmland, which featured hedgerows, shelterbelts and well-maintained stone walls.

12.3.40 In rural areas, the fertile agricultural land is dominated by large arable fields, with less productive land divided into smaller fields and paddocks for grazing.

12.3.41 To the south of Rosyth, St. Margaret's Marsh has developed on reclaimed intertidal land formed by the tipping of dredged waste and domestic waste.

Vegetation

12.3.42 Vegetation cover in the study area varies to reflect the natural influences of local geology, landform, microclimate, drainage, soil, colonisation and biodiversity and human influences upon land use and management.

12.3.43 Extensive estate woodlands and shelterbelts occur predominantly within the country estates scattered throughout the southern study area, with several of the older woodland areas such as those at Dalmeny, Dundas, Hopetoun, and Newliston originating from designed landscapes dating back to the 17th century. These woodlands are a key feature of the area and contribute to its distinctive character.

12.3.44 Broadleaf and mixed woodland is distributed elsewhere as shown on Figure 10.2.

12.3.45 The majority of agricultural land within the northern and southern study areas is arable, with shelterbelts and hedgerows used extensively to reflect the exposed nature of the broad valley setting. A reclaimed area at St. Margaret's Hope provides a distinctive marshland element adjacent to the water.

SNH Landscape Character Assessments

12.3.46 Collective Landscape Character Types (LCTs), based on those outlined in the Lothians Landscape Character Assessment (TLLCA) and Fife Landscape Character Assessment (FLCA), are applied throughout the northern and southern study areas, as detailed below. The LCTs have been further classified in this assessment as Local Landscape Character Areas (LLCAs), as shown on Figure 12.1, to take account of the local landscape features. Detailed descriptions of the LLCAs and evaluation of the sensitivity to change are contained in Appendix A12.1.

Lowland Hill and Valley Farmland LCT

12.3.47 The Lowland Hill and Valley Farmland LCT comprises a variety of undulating landforms with open regular farmland patterns of medium-scale fields of arable and grasslands. Field boundaries consist of fencing and hedgerows with hedgerow trees. Roads within the area relate well to the landform and contribute to the generally well maintained, safe, quiet, balanced and calm landscape (based on extract from SNH, 1999). LLCAs are listed in Table 12.5.

Table 12.5: Lowland Hill and Valley Farmland LLCAs

LLCA	Figure Number	Overall Sensitivity
Duloch	12.1b	low
Inverkeithing Farmland	12.1b	medium
Duddingston	12.1c and d	medium
Craigbrae	12.1c and d	medium

Wooded Lowland Hill and Valley LCT

12.3.48 This LCT contains undulating landforms, often valley slopes and hills, that feature extensive areas of plantations, shelter planting and other dominant linear and point features of plantations and tree groups (based on extract from SNH, 1999). LLCAs classified under this type, are listed in Table 12.6.

Table 12.6: Wooded Lowland Hill and Valley LLCAs

LLCA	Figure Number	Overall Sensitivity
North Inverkeithing	12.1b	low to medium
Humbie	12.1c and d	high

Coastal Hills LCT

12.3.49 Coastal Hills LCTs have a strong association with the coast through views, sounds, smells and other coastal experiences. Features also include large open undulating fields with fences, low hedgerows or drystone dykes and hillsides with scrub woodland or rough grazing. Settlement is in exposed, isolated farms often with converted outbuildings (adapted from SNH, 1999). LLCAs classified under this type are listed in Table 12.7.

Table 12.7: Coastal Hill LLCAs

LLCA	Figure Number	Overall Sensitivity
Letham Hill	12.1b	medium to high
Castlandhill	12.1b	medium
Ferry Hills	12.1b and c	medium to high

Coastal Flats LCT

12.3.50 Coastal Flats are low-lying, open, exposed, large-scale coastal landscapes close to sea level encroached by industry and other built developments. Land cover also includes open grassland expanses. A coastal landscape where the character is always influenced by the sea and can be particularly affected by the weather conditions and views of the sky and the sea (adapted from SNH, 1999). LLCAs classified under this type are listed in Table 12.8.

Table 12.8: Coastal Flats LLCAs

LLCA	Figure Number	Overall Sensitivity
North Queensferry	12.1b and c	low to medium

Designed Wooded Landscape LCT

12.3.51 These landscape character types are formed around large country houses and estates. Features include large woodland blocks and shelterbelts which surround arable fields, tree clumps and isolated trees. There are often artificial and natural ponds and water features, as well as other features of a designed landscape such as ha-has and tree lined access roads. Well maintained stone walls mark estate boundaries and dwellings range from stately manor houses to simple vernacular estate cottages within extensive grounds. LLCAs classified under this type are listed in Table 12.9.

Table 12.9: Designed Wooded Landscape LLCAs

LLCA	Figure Number	Overall Sensitivity
Hopetoun	12.1c	high
Dalmeny	12.1c	high
Dundas	12.1c and d	high
Newliston	12.1d	high

Disturbed Farmland LCT

12.3.52 The Disturbed Farmland character type is characterised by rolling lowland fields featuring large hills formed from mining spoils. The spoil heaps dominate the surrounding landscape and are highly visible. Other features include manmade elements such as landfill sites, canals and rail lines

forming a distinctive post industrial landscape. Settlements include scattered farms. LLCAs classified under this type are listed in Table 12.10.

Table 12.10: Disturbed Farmland LLCAs

LLCA	Figure Number	Overall Sensitivity
Craigton	12.1c and d	low to medium

Lowland Plain LCT

12.3.53 The Lowland Plain character type is a flat or gently undulating landform with a rural matrix of predominantly arable farmland. Field edges include small hedgerows with mature trees and stone walls (adapted from SNH, 1998). LLCAs classified under this type are listed in Table 12.11.

Table 12.11: Lowland Plain LLCAs

LLCA	Figure Number	Overall Sensitivity
River Almond	12.1c and d	medium to high
Overton	12.1d	medium

Firth of Forth LCT

12.3.54 This character area is a large scale, exposed, horizontal landscape dominated by the weather conditions and the sky. It is generally calm and colourful with extensive views. Features include off-shore islands, moving vessels and changing coastline features influenced by the tide. Dominant structures in the landscape are the Forth Road Bridge and Forth Rail Bridge. The LLCA classified under this type, figure number location and evaluation of sensitivity to change due to development are listed in Table 12.12.

Table 12.12: Maritime LLCAs

LLCA	Figure Number	Overall Sensitivity
Firth of Forth	12.1b and c	high

Urban / Industrial LCT

12.3.55 Urban and Industrial areas are a feature of the landscape adding colour and texture. Negative attributes however include fragmentation of the rural landscape. LLCAs classified under this type are listed in Tables 12.13 and 12.14.

Table 12.13: Urban LLCAs

LLCA	Figure Number	Overall Sensitivity
Rosyth	12.1b	low
Dalgety Bay	12.1b	medium
Inverkeithing	12.1b	medium
North Queensferry	12.1b and c	medium to high
South Queensferry	12.1c	medium to high
Kirkliston	12.1d	medium

Table 12.14: Industrial LLCAs

LLCA	Figure Number	Overall Sensitivity
Inverkeithing Industrial Estate	12.1b	low
South Inverkeithing Bay	12.1b	low
Rosyth Industrial Area	12.1b	low
Newbridge Industrial Area	12.1d	low to medium

Existing Road Corridor LCT (A90/M90/M9/M9 Spur)

12.3.56 The A90, M90, M9 and M9 Spur form large linear elements in the landscape that are distinct from the surrounding landscape features. They are characterised by cuttings through hills and large embankments with scrub woodland planting in places. They are also areas of intense activity in contrast to the relative tranquillity of the rural surroundings. The LLCA classified under this type are listed in Table 12.15.

Table 12.15: Existing Road Corridor LLCA

LLCA	Figure Number	Overall Sensitivity
A90/M90/M9/M9 Spur	12.1a,b, c and d	low

Local Landscape Character Assessments

12.3.57 A full description and evaluation of the sensitivity of each LLCA and settlement area is contained in Appendix A12.1.

12.4 Potential Impacts

12.4.1 Potential landscape impacts may include the following:

- alteration of the regional and local character of the landscape, or the special qualities of designated areas, due to loss of landscape elements and the addition of the Main Crossing to the landscape setting of the Forth Road Bridge and Forth Rail Bridge;
- introduction of infrastructure elements associated with the proposed scheme, including road surface, noise barriers and false cuttings, SUDS detention ponds, bridges, underpass, culverts, ITS gantries, signage and lighting; and
- alterations to landform, land use, pattern, boundaries, vegetation and watercourses.

12.4.2 As stated in paragraphs 12.1.6 and 12.2.2, the assessment also includes consideration of landscape impacts from the introduction of ITS gantries and night-time lighting throughout the proposed scheme and also outwith the highway works for the proposed scheme on existing sections of the M90 and on the M9 Spur.

12.4.3 As stated in paragraph 12.2.2, impacts from the ITS gantries north of Admiralty would be limited exclusively to the area within the existing motorway boundary.

12.4.4 Landscape impacts of the proposed scheme on each LLCA, taking mitigation into account, are assessed in summary in section 12.6 (Residual Impacts), as shown below, and in detail in Appendix A12.1.

12.4.5 For a summary of direct and indirect residual impacts from the Main Crossing refer to paragraphs 12.6.4 to 12.6.10 and Tables 12.16 and 12.17.

12.4.6 For a summary of direct and indirect residual impacts from the northern route refer to paragraphs 12.6.11 to 12.6.19 and Tables 12.18 and 12.19.

12.4.7 For a summary of direct and indirect impacts from the southern route refer to paragraphs 12.6.20 to 12.6.32 and Tables 12.20 and 12.21.

12.4.8 For a summary of overall residual impacts from the proposed scheme refer to paragraphs 12.6.33 to 12.6.39 and Table 12.22.

12.5 Mitigation

Introduction

12.5.1 Landscape mitigation proposals have been designed in accordance with the policy documents, 'Cost Effective Landscapes: Learning from Nature' (CEL:LfN) (Scottish Executive, 1998), 'DMRB Volume 10' (Highways Agency et al., 1993) and 'Planning Advice Note (PAN) 58: Environmental

Impact Assessment (Scottish Executive, 1999). The principles in CEL:LfN have three central themes to be applied throughout the planning, design and implementation of a road proposal:

- use natural characteristics (such as the use of native plants species which occur locally);
- exploration of alternatives (such as the consideration of different methods of noise attenuation such as barriers or false cuttings); and
- wise use of resources (such as on-site recycling of materials arising from site clearance).

12.5.2 Landscape mitigation is concerned primarily with mitigation of adverse impacts and as previously stated in paragraph 12.1.7, impacts assessed as being of Moderate or greater significance were considered to represent key landscape changes and mitigation would generally be required to avoid or reduce these where practicable.

12.5.3 Mitigation of adverse impacts falls into three categories:

- Prevention: avoidance of the loss of significant landscape elements through design of proposed scheme to achieve sensitive horizontal and vertical alignment;
- Reduction: lessening of those adverse effects that cannot be eliminated by prevention (e.g. roadside mounding and planting to integrate with surrounding landform and landscape); and
- Offsetting: provision of alternative or compensatory measures where appropriate and feasible (e.g. replacing woodland where appropriate).

12.5.4 Detailed landscape mitigation proposals will subsequently be incorporated within Contract Documents, of which the Environmental Statement will form a part. This will include a requirement that the detailed design meets the objectives of the mitigation and that the details of the landscape mitigation are agreed in consultation with SNH. In addition, a section specifically addressing design aesthetics will be produced within the contract documents to provide further details of how specific mitigation measures are to be implemented and how design aesthetics are to be addressed.

Application of Mitigation Principles

12.5.5 Prevention, reduction and offsetting approaches were applied during the proposed scheme planning/design and are described below. Figure 12.4 shows the proposed landscape mitigation.

Prevention

12.5.6 This evolved from an iterative process between the environment, landscape, aesthetic and design teams, with consideration given to aesthetics throughout the process. Measures include best fit with existing landform, avoidance of the loss or damage to landscape features such as walls, water features or field systems and avoidance of the loss or damage to sites of ecological or archaeological interest, as identified in Chapters 10 and 11 (Terrestrial and Freshwater Ecology and Estuarine Ecology) and Chapter 14 (Cultural Heritage).

Reduce/Offset

12.5.7 Measures designed to reduce and offset adverse impacts, are summarised in paragraphs 12.5.9-12.5.27.

12.5.8 Location specific measures are described in Tables 12.16-12.21 and illustrated on Figure 12.4.

Earthworks

12.5.9 Earthworks proposals aim to minimise the impact of cuttings and embankment slopes and to allow integration of the road with surrounding land (mitigation item L1), through:

- modification of embankment and cutting slopes to tie smoothly into existing landform;
- softening changes in slope at junctions and overbridges by smoothing out transitions between slopes; and
- rounding off top and bottom of cuttings and embankments.

Rock Cuttings

12.5.10 Where the proposed scheme passes through areas of rock cutting, appropriate measures will be taken to achieve slopes which reflect the natural strata and the existing rugged terrain, providing ledges, niches and benches to promote re-establishment of vegetation by natural regeneration (mitigation item L2). All rock cut profiles shall therefore exploit the nature of the discontinuities and character of the natural rock mass so as to create a profile with a natural appearance, avoiding the creation of uniform smooth faces. Rock traps will be placed alongside the road, where these are required for safety.

12.5.11 Bulk blasting as well as pre-split methods may be used, followed by a variety of techniques to achieve the desired profile and surface.

SUDS Detention Basins

12.5.12 SUDS detention basins, required as part of the road drainage system, will be sited within naturally low areas and designed to look as natural as possible. Surrounding earthworks will be designed with smooth flowing contours to integrate with the surrounding landform. Any boundary fencing around detention basins will be designed to be as unobtrusive as possible, with the fence type and alignment designed to minimise visual impact. Planting of native scrub will be undertaken to help screen proposed fencing, outfall and inlet structures, integrate with the surrounding habitat and promote biodiversity (mitigation item L3).

Noise Barriers

12.5.13 Where noise barriers are proposed, as determined by the noise assessment, they will be provided in the form of barriers and false cuttings (mitigation item L4). Under the Design and Build contract proposed for the scheme, the detailed design of the noise barriers will be undertaken by the contractor responsible for the works. The location of the proposed noise barriers is shown on Figures 12.4 (landscape) and Figures 16.10 to 16.15 (noise).

Aesthetics

12.5.14 To enhance the experience of the road user and promote a sense of place, the design of the Main Crossing and other bridge structures forming part of the proposed scheme has been informed by detailed input from specialist aesthetic advisors, aesthetics and design team workshops and consultation with Architecture and Design Scotland.

12.5.15 The Main Crossing has been designed to be an aesthetically pleasing structure, with a scale which is sympathetic to the surrounding landscape and complementary to the form of the Forth Road Bridge and Forth Rail Bridge. The towers of the Main Crossing would not dominate the slender towers of the Forth Road Bridge or detract from the familiar setting of the two existing iconic structures. The design of the Main Crossing would therefore be a recognisable iconic structure relating to the 21st century just as the Forth Rail Bridge is a memorial to the 19th century engineering and the Forth Road Bridge relates to the 20th century.

Planting

12.5.16 Proposals relating to existing and new planting comprise:

- retention of existing trees and vegetation wherever possible and incorporation with new planting proposals (mitigation item L5);
- enhancement of biodiversity through use of predominantly native species, providing new wildlife habitats and complementing existing adjacent habitats (mitigation item L6);
- planting to replace trees lost to the construction of the proposed scheme (mitigation item L6);
- planting at junctions and bridges to help assimilate the new structures into the surrounding landscape(mitigation item L6);
- planting to provide screening to reduce visual impacts of the road, structures and lighting (mitigation item L6);

- planting of severed field corners and landlocked areas as appropriate (mitigation item L6); and
- planting at focal points and junctions (mitigation item L6).

12.5.17 Planting mixes will be based predominantly on native species, which are established in the area and adapted to local conditions (mitigation item L6). Young stock will generally be used because it is easier to establish. Larger plants will be used to provide an initial impact in specific locations, for example where screening is required.

12.5.18 Planting will enhance the experience of travelling along the new road by creating views to a variety of woodland types (mitigation item L6).

12.5.19 Planting will assist integration with the local landscape character by using species mixes and planting patterns typical of the local landscape (mitigation item L6). National Vegetation Classification (NVC), which is used to describe and categorise the vegetation covering land in Great Britain, will inform the selection of plant species.

12.5.20 Due to the possibility of attracting increased bird activity through tree planting in the vicinity of Edinburgh Airport, BAA has been consulted in relation to planting beside the proposed scheme north and south of the Firth of Forth within a 13km zone of the airport and the planting design developed to reduce the risk of birds presenting a hazard to aircraft.

12.5.21 Proposed 'Mixed Woodland' planting, which requires both broad-leaved and coniferous woodland for visual screening purposes, will comprise plants which range in size from feathered trees to whips and transplants. This will aim to create multi-layered woodland with a balanced mix of native deciduous and coniferous trees, including native evergreen understorey. The balance between deciduous and evergreen species will be varied to achieve year-round screening and reflect existing woodland local to the various sections of the road. Conifers within the Mixed Woodland will be native species Scots pine and yew, with non-native species limited to larch. Species mixes and densities will be reduced near the airport to decrease the potential for birds to nest, roost and feed from berries.

12.5.22 Proposed 'Scrub Woodland' planting will comprise native species of local provenance such as birch, hawthorn, hazel, cherry, blackthorn and dog rose. This mix is used in areas where a lower height plant cover is more appropriate than the taller woodland mixes. There will be a reduced percentage of berry bearing species near to the airport.

12.5.23 Standard trees will be planted in areas where tree lines are a feature of the landscape and hedgerow trees will be planted to reflect the existing landscape pattern,and provide effective mitigation at an early stage.

12.5.24 Hedgerows will be planted to tie revised boundaries into existing field boundaries using species such as beech, hawthorn and guelder rose.

12.5.25 Unless otherwise stated, planting will comprise native species of local provenance.

Proposed Grass Seeding

12.5.26 For all disturbed soft areas and road verges (mitigation item L7), three different seed mixes will be used, dependant on location and use:

- Roadside Verge Mix: suited to the road-side location being low maintenance, fast establishing and tolerant of traffic and salt spray; and
- Species-rich Grassland Mix: suited for use in all other areas disturbed by construction works, consisting of a mixture of native, non-invasive grasses and wildflower species to reflect locally occurring semi-natural flora.

Proposed Habitat Creation for Ecological Mitigation

12.5.27 In addition to following the general objective of enhancing biodiversity through the landscape mitigation, more detailed habitat creation proposals are provided in Chapter 10 (Freshwater and Terrestrial Ecology).

Location-specific Mitigation

12.5.28 Details of site-specific landscape mitigation for each LLCA are provided in Section 12.6 (Residual Impacts).

12.6 Residual Impacts

12.6.1 The residual impacts of the proposed scheme have been assessed taking the proposed landscape mitigation, designed to reduce the nature and extent of impacts where practicable, into account.

12.6.2 As stated in paragraph 12.2.20, impacts reported in this assessment are considered adverse unless otherwise stated.

12.6.3 Photographs from a number of key viewpoints, located as shown in Figure 12.6, are shown in the photomontage and wireline photographs provided as Figures 12.7. These illustrate views with and without the proposed scheme and were used to inform the assessment of impacts.

Main Crossing

12.6.4 The Main Crossing would be the most prominent element of the proposed scheme and feature as an additional structure to the Forth Road Bridge and Forth Rail Bridge in both the local and wider landscape.

12.6.5 Direct impacts on LLCAs are described below, in the order that the LLCAs occur from north to south, and summarised in Table 12.16. Significant indirect impacts, which would only occur for North Queensferry Urban LLCA, are detailed in paragraph 12.6.8 and all indirect impacts are summarised in Table 12.17.

12.6.6 Ferry Hills is assessed as having medium to high sensitivity to change. The north landing of the bridge would be located on the western side of the hill, affecting the setting of Admiralty House (also known as St Margaret's Hope) and resulting in loss of woodland, altered landform, rock cutting and shading. The magnitude of change would be high, with an overall Substantial impact significance.

12.6.7 The Firth of Forth has high sensitivity to change and the Main Crossing would feature as an additional structure to the Forth Road Bridge and Forth Rail Bridge in both the local and wider landscape. The exemplary standard of aesthetic design is considered to provide significant mitigation for impacts so that a medium to high magnitude of change in both the winter year of opening and in the summer after 15 years and the resulting neutral impact of Substantial to Severe significance, as indicated in Table 12.3, would be reduced to Moderate to Substantial significance. Direct (adverse) impacts upon Beamer Rock, which would support the central tower for the Main Crossing, would be of Moderate significance, but the isolated and limited extent of this impact within the overall context of the Firth of Forth LLCA is not considered to affect the overall significance of this neutral impact.

12.6.8 North Queensferry (urban) has medium to high sensitivity to change. The Main Crossing would tie in near the western edge of the LLCA, beyond the existing Forth Road Bridge resulting in medium magnitude of change to the character of the area and a neutral impact of Moderate significance.

12.6.9 South Queensferry has medium to high sensitivity to change. The Main Crossing would be remote from the northwestern edge of the South Queensferry Conservation Area and the approach viaduct would pass in close proximity to Port Edgar. The magnitude of change is predicted as low to medium and overall South Queensferry would experience neutral impacts of Slight to Moderate significance, with no change predicted over time.

12.6.10 Duddingston has medium sensitivity to change. The southern landing would be located in the northeast corner of this agricultural area. The large scale of the Main Crossing would affect a limited area of the LLCA adjacent to existing urban development. The magnitude of change is therefore assessed as medium and the overall significance of impact in both winter year of opening and thereafter would remain Moderate.

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Table 12.16: Summary of Direct Residual Impacts – Main Crossing

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Description of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, 15 years after opening			Winter, year of opening	Summer, 15 years after opening
Coastal Hill: Ferry Hills							
Medium	Undulating hill top	Low	Low	None	• Direct adverse impact; large scale, long-term, permanent. • Introduction of Main Crossing as a new landscape element. • Introduction of abutment. • Loss of woodland beneath bridge. • Disruption of setting of Admiralty House. • Shadow and shade.	Negligible	Negligible
High	Wooded hill to the west of A90	High	High	Aesthetics are major consideration in the design of the Main Crossing.		Substantial	Substantial
Medium to High	Wooded hill to the east coast	Low	Low	None		Negligible	Negligible
Overall Impact Summary							
medium to high	All areas	High	High	See above.	See above.	Substantial	Substantial
Maritime: Firth of Forth							
High	Main waterbody	Medium to High	Medium to High	Aesthetics are major consideration in the design of the Main Crossing.	• Direct neutral impact; large scale, long-term, permanent. • Introduction of Main Crossing as a new landscape element.	Moderate to Substantial Neutral	Moderate to Substantial Neutral
High	Shores and mudflats	Medium to High	Medium to High			Moderate to Substantial Neutral	Moderate to Substantial Neutral
High	Islands	Medium to High	Medium to High		• Direct neutral impact; large scale, long-term, permanent. • Introduction of Main Crossing as a new landscape element.	Moderate to Substantial Neutral	Moderate to Substantial Neutral
Medium	Beamer Rock	Medium to High	Medium to High	Reinstatement of rock around tower foundation.	• Beamer Rock utilised for central pier.	Moderate	Moderate
Overall Impact Summary							
High	All areas	Medium to High	Medium to High	See above.	See above.	Moderate to Substantial Neutral	Moderate to Substantial Neutral

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Description of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, 15 years after opening			Winter, year of opening	Summer, 15 years after opening
Urban Area: South Queensferry							
Medium to High	All areas	Low to Medium	Low to Medium	Aesthetics are major consideration in the design of the Main Crossing.	• Direct neutral impact; large scale, long-term permanent. • Introduction of Main Crossing as a new landscape element.	Slight to Moderate	Slight to Moderate Neutral
Lowland Hill and Valley Farmland: Duddingston							
Medium	North facing Slopes	Medium	Medium	Aesthetics are major consideration in the design of the Main Crossing. Noise barriers on south viaduct.	• Direct adverse impact; large scale, long-term, permanent. • Introduction of Main Crossing as new landscape element. • Loss of trees and mature hedgerow under Main Crossing. • Introduction of abutment. • Disruption of setting of Inchgarvie House and Lodge. • Shadow and shade.	Moderate	Moderate
Medium	Undulating farmland	Low	Low	None	None	Negligible	Negligible
Low to Medium	South facing slopes	Low	Low	None	None	Negligible	Negligible
Overall Impact Summary							
Medium	All areas	Medium	Medium	See above.	See above.	Moderate	Moderate

Table 12.17: Summary of Indirect Residual Impacts and LLCAs with no impacts – Main Crossing

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, 15 years after opening			Winter, year of opening	Summer, 15 years after opening
Coastal Flats: North Queensferry							
Low to Medium	All areas	Low to Medium	Low to Medium	Aesthetics are major consideration in the design of the Main Crossing.	• Indirect neutral impact; large scale, long-term, permanent. • Introduction of Main Crossing as new landscape element influencing the setting of the coastal flats.	Slight to Moderate Neutral	Slight to Moderate Neutral
Urban Area: North Queensferry							
Medium to High	All areas	Medium	Medium	Aesthetics are major consideration in the design of the Main Crossing.	• Indirect neutral impact; large scale, long-term, permanent. • Introduction of Main Crossing as new landscape element influencing the setting of the settlement.	Moderate Neutral	Moderate Neutral
Designed Wooded Landscape: Hopetoun							
High	All Areas	Low to Medium	Low to Medium	Aesthetics are major consideration in the design of the Main Crossing.	• Indirect neutral impact; large scale, long-term, permanent. • Introduction of Main Crossing as new landscape element influencing the setting of the estate.	Slight to Moderate Neutral	Slight to Moderate Neutral
Lowland Hill and Valley Farmland: Duloch, Inverkeithing Farmland and Craigbrae. **Industrial Area: Inverkeithing Industrial Estate, Rosyth Industrial Estate, South Inverkeithing Bay and Newbridge.** **Urban Area: Rosyth, Inverkeithing and Kirkliston.** **Lowland Hill: North Inverkeithing and Letham Hill.** **Coastal Hill: Castlandhill.** **Designed Wooded Landscape: Dalmeny, Newliston and Dundas.** **Wooded Lowland Hill and Valley: Humbie.** **Disturbed Farmland: Craigton.** **Lowland Plain: Overton and River Almond.** **Existing Road Corridor: M9, A90, M90.**							
As shown in Tables 12.5 to 12.15.	All areas	No change	No change	None	None	None	None

Northern Route

12.6.11 ITS gantries and night-time lighting outwith the highway works for the proposed scheme would be introduced north of the proposed scheme on the M90 between Admiralty Junction to Halbeath.

12.6.12 The proposed scheme is online between Fairy Kirk Hill and Ferrytoll, from where it continues south by viaduct to join the north landing of the Main Crossing. The adjacent local road network would also be adjusted to accommodate these changes.

12.6.13 Direct impacts upon LLCAs are described below, in the order that the LLCAs occur from north to south, and summarised in Table 12.18. No significant indirect impacts are assessed and key details only are summarised in Table 12.19.

12.6.14 Inverkeithing settlement has medium sensitivity to change. The proposed scheme would widen the cutting at the southern edge of Muckle Hill, adversely affecting an adjacent cemetery, the profile of the hill and incurring loss of vegetation. Proposed mitigation in the area includes reinstatement of the stone boundary wall to the cemetery (mitigation item L10) and scrub woodland planting (mitigation item L9), where the cutting is sensitively regraded (mitigation item L8). The magnitude of change would be low to medium in winter year of opening, becoming low in the summer after 15 years, with impacts of Slight to Moderate significance reducing to Slight significance.

12.6.15 Castlandhill has medium sensitivity to change. Direct impacts would occur on the south-eastern edge of the LLCA with the reconstruction of Ferrytoll Junction, the realignment of Castlandhill Road and the introduction of ITS gantries with maintenance lay-bys The new layout would introduce adverse impacts. Proposed mitigation in the area includes mixed woodland planting to provide screening (mitigation item L14) and replacement woodland habitat by extending the existing woodland on the hill (mitigation item L12). New mixed and scrub woodland will integrate the realigned Castlandhill Road into the landscape and form a visual separation with the A90 (mitigation items L11 and L13). The magnitude of change would be medium in the winter year of opening resulting in Moderate significance impact. In the summer after 15 years the magnitude of change would reduce to low to medium and the impact significance would reduce to Slight to Moderate.

12.6.16 South Inverkeithing Bay has low sensitivity to change and would only be affected by the new Ferrytoll Junction. Proposed mitigation in the area includes scrub woodland planting at the roundabout and southbound slip road (mitigation items L20 and L21). Since the proposed changes would not significantly alter the landscape features in the area the magnitude of change would be low and the overall significance would be Negligible in both the winter year of opening and in the summer after 15 years.

12.6.17 Ferry Hills has medium to high sensitivity to change. The proposed scheme would pass through the western edge of the LLCA in cutting across the hilltop, permanently altering the topography and vegetation. It would introduce an additional embankment and cutting where the existing A90 ties in with the proposed scheme and the existing B981, and access to Admiralty House is realigned. ITS gantries with maintenance lay-bys would also be introduced. Mitigation in the area will include naturalistic grading of rock cut and promotion of natural regeneration (mitigation items L22 and L25), mixed and scrub woodland planting along embankments and cuttings to replace lost vegetation and improve biodiversity value (mitigation items L23 and L24). The magnitude of change would be high in both the winter in the year of opening and in the summer 15 years after opening, with residual impacts of Substantial significance.

12.6.18 North Queensferry Coastal Flat has low to medium sensitivity to change. The realigned B981 would cross to the south and west of the Dunfermline Wastewater Treatment Works (WWTW) on embankment with realigned access to the WWTW, a new bridge over the railway line and the introduction of ITS gantries with maintenance lay-bys. The A90 on viaduct and local roads on embankment would also feature in the east edge of the LLCA and a SUDS detention basin would be introduced to the southeast, at the foot of Ferry Hill. Proposed mitigation for the area includes scrub woodland planting on the western embankment of the B981 and around the SUDS detention basin (mitigation item L18). Mixed woodland planting is proposed to provide screening for the WWTW (mitigation items L16 and L17). Scrub woodland, stone facing and gravel is proposed beneath the viaduct (mitigation item L15) and standard trees are proposed to tie in with Ferrytoll

Junction (mitigation item L19). The extensive earthworks and structures would result in a high magnitude of change in the winter year of opening which would reduce to a medium to high magnitude in the summer after 15 years. This would result in a Substantial overall significance in the winter year of opening, reducing to Moderate to Substantial in the summer after 15 years.

12.6.19 The Existing Road Corridor LLCA has low sensitivity to change. Impacts, which include widening of the road corridor between Admiralty and Ferrytoll, introduction of a revised gyratory at Ferrytoll and introduction of ITS gantries with maintenance laybys from Ferrytoll to Halbeath, would not be significant. A number of mitigation measures for potential direct impacts on LLCAs adjacent to the northern route would also reduce impacts on this LLCA. These include mixed and scrub woodland planting on embankments and cuttings and naturalistic grading of rock and soft cuttings and promotion of natural regeneration or seeding with species-rich grassland (mitigation items L8-L14, L16 and L20-L25). These changes would result in medium magnitude of change of Slight to Moderate significance in the winter year of opening. This would reduce to low to medium magnitude of change of Slight significance in the summer after 15 years.

Table 12.18: Summary of Direct Residual Impacts – Northern Route

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Urban Area: Inverkeithing							
Medium	All areas	Low to Medium	Low	• Scrub woodland planting (mitigation item L9). • Naturalistic grading of new rock and soft cuttings and promotion of natural regeneration (mitigation item L8). • Reinstate stone wall at cemetery boundary (mitigation item L10).	• Direct adverse impact; medium scale, long-term, permanent. • Regraded cutting on western side of Muckle Hill.	Slight to Moderate	Slight
Coastal Hill: Castlandhill							
Medium	Whinney Hill	Medium	Low to Medium	• Mixed woodland planting (mitigation items L11 & L12). • Scrub woodland planting (mitigation item L13).	• Direct adverse impact; large scale, long-term, permanent. • Introduction of new road cutting through the south-east of the hill with some embankment to the south • Introduction of slip road in slight cutting through the south-east of the hill. • Introduction of gyratory in south-east of LLCA. • Introduction of ITS gantry with maintenance lay-by.	Moderate	Slight to Moderate
Medium	North Hill	Low	Low	• Mixed woodland planting (mitigation item L14).	• Direct adverse impact; small scale, long-term, permanent. • Introduction of slip road on slight embankment adjacent to the existing A90. • Introduction of ITS gantry with maintenance lay-by.	Negligible to Slight	Negligible
Overall Impact Summary							
Medium	All areas	Medium	Low to Medium	See above.	See above.	Moderate	Slight to Moderate

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Coastal Flats: North Queensferry							
Low to Medium	All areas	High	Medium to High	• Stone facings and local gravel beneath viaducts with ivy planting where light permits (mitigation item L15). • Mixed woodland planting (mitigation item L16 & L17)). • Scrub woodland planting (mitigation item L18). • Standard tree planting (mitigation item L19)..	• Direct adverse impact; large scale; long-term; permanent. • Introduction of A90 and slip roads on viaduct • Realigned B981 on embankment. • SUDS detention basin. • Introduction of roundabout at junction of realigned B981 and Ferry Toll Road. • Introduction of ITS gantries with maintenance lay-bys.	Substantial	Moderate to Substantial
Industrial: South Inverkeithing Bay							
Low	All areas	Low	Low	• Scrub woodland planting with rock/boulders at gyratory (mitigation item L20). • Scrub woodland plantingbetween Park and Ride and s/b slip road to Ferrytoll gyratory (mitigation item L21). • Species-rich grassland (mitigation item L20).	• Direct adverse impact; small scale, long-term, permanent. • Realigned junction at Ferrytoll.	Negligible to Slight	Negligible
Coastal Hill: Ferry Hills							
Medium	Undulating hill top	Medium	Medium	• Naturalistic grading of rock cut and promotion of natural regeneration (mitigation item L22). • Mixed woodland planting (mitigation item L23).	• Direct adverse impact; medium scale, long-term, permanent. • Reprofile of rock cuttings to eastern edge between A90 and railway	Slight to Moderate	Slight to Moderate

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
High	Wooded hill to the east of A90	High	High	• Mixed woodland planting (mitigation item L24). • Scrub woodland planting (mitigation item L24). • Naturalistic grading of rock cut and promotion of natural regeneration (mitigation item L25).	• Direct adverse impact; large scale, long-term, permanent. • Cutting through top of hill. • Loss of mature woodland. • Cutting through rock for road realignment. • Introduction of noise and traffic movement. • Disruption to setting of Admiralty House. • Introduction of ITS gantries with maintenance lay-bys.	Substantial	Substantial
Medium to High	Wooded hill to the east coast	Low	Low	None	None	None	None
Overall Impact Summary							
Medium to High	All areas	High	High	See above	See above	Substantial	Substantial
Existing Road Corridor: A90/M90/M9//M9 Spur							
Low	A90/M90 North of the Firth of Forth (Halbeath to Ferryhills)	Medium	Low to Medium	Measures identified above for LLCAs adjacent to the northern route, with direct impacts, which also reduce impacts for this LLCA (mitigation items L8-L14, L16 & L20-L25): • Mixed woodland planting. • Scrub woodland planting. • Naturalistic grading of rock and soft cuttings and promotion of natural regeneration or seeding with species-rich grassland.	• Direct adverse impact; large scale, long-term, permanent. • Widening of corridor between Admiraly and Ferrytoll. • Introduction of revised gyratory at Ferrytoll. • Realignment of A90 to Main Crossing on viaduct. • Introduction of ITS gantries with maintenance laybys.	Slight to Moderate	Slight

Table 12.19: Summary of Indirect Residual Impacts and LLCAs with no impacts – Northern Route

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals *	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Wooded Lowland Hill and Valley: North Inverkeithing							
Low to Medium	Bluffs and wooded areas	Low	Low	None	• Indirect adverse impact; small scale, long-term, permanent. • Regrading of cutting south of Admiralty Junction directly opposite west of LLCA.	Negligible	Negligible
Low	Fields to the South	Low	Low	None	• Indirect adverse impact; small scale, long-term, permanent. • Regrading of cutting south of Admiralty Junction directly opposite LLCA.	Negligible	Negligible
low	Playing Field	Low	Low	None	None	Negligible	Negligible
Overall Impact Summary							
low to medium	All areas	Low	Low	See above.	See above.	Negligible	Negligible
Urban Area: Rosyth							
Low	All areas	Low	Low	• Scrub woodland planting (mitigation item L13). • Mixed woodland planting (mitigation item L14).	• Indirect adverse impact; small scale, long-term, permanent. • Regrading of cutting south of Admiralty Junction.	Slight	Negligible
Maritime Landscape: Firth of Forth							
High	All Areas	Low	Low	• Mixed and scrub woodland planting (mitigation item L24). • Naturalistic grading of rock cuts, promotion of natural regeneration (mitigation item L25).	• Indirect adverse impact; small scale, long-term, permanent. • Introduction of traffic movement and the infrastructure of the realigned B981 and northern viaduct into landscape setting.	Slight	Negligible
Lowland Hill and Valley Farmland: Duloch, Inverkeithing Farmland, Duddingston and Craigbrae. Industrial Area: Inverkeithing Industrial Estate, Rosyth Industrial Estate and Newbridge. Coastal Hill: Letham Hill. Urban Area: Dalgety Bay, North Queensferry, South Queensferry and Kirkliston.					**Designed Wooded Landscape: Hopetoun, Dalmeny, Dundas and Newliston. Wooded Lowland Hill and Valley: Humbie. Disturbed Farmland: Craigton. Lowland Plain: Overton and River Almond.**		
See Tables 12.5-15	All areas	No change	No change	None	None	None	None

Note: Summary of Mitigation Proposals – these are measures identified for adjacent LLCAs with direct impacts, which also reduce impacts for LLCAs with indirect impacts.

Southern Route

12.6.20 ITS gantries and night-time lighting outwith the highway works for the proposed scheme would be introduced on the M9 Spur, which links the offline and online sections of the southern route.

12.6.21 The proposed scheme south of the Firth of Forth commences at the northwest corner of South Queensferry, with the south landing of the Main Crossing, and passes Linn Mill to the east and the main town to the west and south to connect with the existing A90 and M9 spur and also the A904, via the proposed Queensferry Junction.

12.6.22 M9 Junction 1A would also be upgraded to provide improved access between the M9 and M9 Spur.

12.6.23 Direct impacts are described below, in the order that the LLCAs occur from north to south, and summarised in Table 12.20. No significant indirect impacts are identified and key details of indirect impacts are summarised in Table 12.21.

12.6.24 South Queensferry has medium to high sensitivity to change. Limited direct impacts would occur from the proposed Queensferry Junction, which would introduce a roundabout at the existing A904 to the southwest of the town, and a realigned junction with the B924. Indirect impacts from the introduction of cuttings, loss of woodland in the adjacent landscape and closure of the existing A90 at Ferry Muir would influence the setting of the town. Standard trees (mitigation item L26) and species-rich grassland (mitigation item L27) would provide mitigation for the directly affected area beside Queensferry Junction. Mitigation measures identified for Duddingston LLCA would also reduce impacts for this LLCA, and include mixed and scrub woodland, hedgerows with and without hedgerow trees, species-rich grassland, false cuttings, noise barriers and replacement stone walls (mitigation items L28-L35, L37 and L39-L42). The direct and indirect impacts combine to produce a medium to high magnitude of change in the winter year of opening reducing to medium in the summer after 15 years. The overall significance would initially be Moderate to Substantial, becoming Moderate in the summer after 15 years.

12.6.25 Duddingston has medium sensitivity to change. The proposed scheme would pass South Queensferry to the west and south, in cutting and on embankment, and provide local access via Queensferry Junction and an access road from the B924 to the south abutment of the Main Crossing. This LLCA would also be affected by the proposed upgrading of M9 Junction 1A and introduction of ITS gantries with maintenance lay-bys. Local field patterns would be severed throughout. The magnitude of change would be high in the winter year of opening and the overall impact would be of Substantial significance. In the summer after 15 years, mixed and scrub woodland, hedgerows with and without hedgerow trees, species-rich grassland, false cuttings, noise barriers and replacement stone walls (mitigation items L28-L45) will reduce the magnitude of change to medium to high and the significance of impact to Moderate to Substantial.

12.6.26 Dundas LLCA has high sensitivity to change. The proposed scheme would provide impacts to the north of the area where existing woodland and field patterns would be severed and ITS gantries with maintenance lay-bys introduced. Mitigation includes replacement mixed woodland and standard trees to integrate the proposed scheme into the surrounding landscape pattern (mitigation items L46-L51) and noise barriers in the form of false cuttings and barriers to the southwest and southeast of the Echline Strip woodland to provide noise attenuation (mitigation items L52 and L53). The magnitude of change in the winter year of opening would be high and the extent of false cuttings and barriers is considered to provide significant mitigation for impacts at this stage, so that the overall impact of Severe significance, as indicated in Table 12.3, would be reduced to Substantial significance. In the summer after 15 years, the magnitude of change would reduce to medium and the residual impact to Moderate to Substantial.

12.6.27 Kirkliston LLCA has medium sensitivity to change and would have impacts to the western and southern edges where cuttings and embankments are to be regraded, a noise barrier provided and an ITS gantry maintenance lay-by introduced. Mitigation would comprise mixed and scrub woodland planting and species rich grassland (mitigation items L54-L57) for screening and integration. The magnitude of change would be low in both the winter year of opening and in the summer after 15 years and the overall impact significance would be slight in the winter year of opening reducing to Negligible in the summer after 15 years.

12.6.28 Overton has medium sensitivity and would be altered by the upgraded M9 Junction 1A., where new slip roads would provide improved access between the M9 and M9 Spur and an ITS gantry maintenance lay-by introduced. Proposed mitigation includes mixed and scrub woodland to integrate the regraded cutting beside the M9 and SUDS detention basin at Ross's Plantation (mitigation items L59-L62), and a hedgerow to tie the boundary of the new slip road into existing field boundaries and reinforce the edge of the existing woodland on the slip road embankment (mitigation item L63). In the winter year of opening there would be a low to medium magnitude of change of Slight to Moderate significance. By summer 15 years after opening, the magnitude of change would have reduced to low and the significance of impact to Slight.

12.6.29 Newliston has high sensitivity to change. The introduction of two detention basins to the eastern edge of the area with an additional realignment of an access track to the northern pond and an ITS gantry maintenance lay-by would produce a low magnitude of change for both the winter year of opening and in the summer after 15 years. Mitigation includes mixed woodland planting at the northern SUDS detention basin, (mitigation item L65), scrub woodland on the regraded embankments and at the southern SUDS detention basin (mitigation item L66). and species-rich grassland (mitigation item L67), which would establish rapidly to reduce impacts sufficiently so that the significance of Slight to Moderate, as indicated by Table 12.3, would be reduced to Slight in both the winter year of opening and summer after 15 years.

12.6.30 The River Almond Valley has medium to high sensitivity. Regrading of embankment along the M9 road corridor would produce a low magnitude of change in both the winter year of opening and in the summer after 15 years. An impact of Slight significance in the winter year of opening would reduce to Negligible to Slight following the establishment of species-rich grassland on the regraded embankment (mitigation item L68).

12.6.31 Newbridge Industrial Area has low to medium sensitivity and would be impacted by the regrading of embankments along the M9 road corridor and the introduction of an ITS gantry maintenance lay-by. Mitigation includes the planting of scrub woodland to replace lost scrub (mitigation item L69) and species-rich grassland (mitigation item L70). The magnitude of change in both the winter year of opening and in the summer after 15 years would be low. The impact in the winter year of opening would be of Slight to Negligible significance reducing to Negligible in the summer after 15 years.

12.6.32 The existing road corridor, defined by the linear landscape created by major roads as they pass through the landscape, has a low sensitivity to change. The proposed scheme would upgrade M9 Junction 1A with the construction of new slip roads and provide the A90 to A8000 Bus Link to the Forth Road Bridge from the existing A90 to the A904 at Ferry Muir. A section of the northbound A90 would become redundant between Scotstoun and Ferrymuir, while the southbound A90 in this location would become utilised as the A90 Bus Link from the Main Crossing to the A90 and M9 Spur. Lighting and ITS gantries with maintenance lay-bys would also be introduced. A number of mitigation measures for potential direct impacts on LLCAs adjacent to the southern route would also reduce impacts on this LLCA and include mixed and scrub woodland, standard tree, hedgerow and hedgerow tree planting, species-rich grassland and a noise barrier at Kirkliston (mitigation items L39-L45, L50, L51 and L54-L70). The magnitude of change in the winter year of opening would be low to medium, with an impact of Slight significance. In the summer after 15 years this would reduce to a low to negligible change and an impact of Slight to Negligible significance.

Table 12.20: Summary of Direct Residual Impacts – Southern Route

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Urban Area: South Queensferry							
Medium to High	All areas	Medium to High	Medium	• Standard tree planting (mitigation item L26). • Species-rich grassland (mitigation item L27). Measures identified for Duddingston and Dundas LLCAs , which also reduce impacts for this LLCA (mitigation items L28-L35, L37 & L39-L42): • Mixed woodland planting. • Scrub woodland planting. • Standard tree planting. • Hedgerow planting. • Hedgerow tree planting. • Species-rich grassland. • False cuttings. • Noise barriers. • Replacement stone walls.	• Direct adverse impact; large scale, long-term, permanent. • Introduction of new Junction with embankments southwest of the LLCA. • Realignment of B924 junction with A904. • Diversion of n/b traffic to Forth Road Bridge from existing A90 to A904 at Ferry Muir.	Moderate to Substantial	Moderate
Lowland Hill and Valley Farmland: Duddingston							
Medium	North facing slopes	High	Medium	• Mixed woodland planting (mitigation item L30 & L33). • Scrub woodland planting (mitigation item L31). • Hedgerow planting (mitigation item L29). • Hedgerow tree planting (mitigation item L29). • Species-rich grassland (mitigation item L32). • False cuttings (mitigation item L28). • Noise barriers (mitigation item L28).	• Direct adverse impact; large scale, long-term, permanent. • Introduction of southern route in cutting and at grade. • Introduction of noise barriers in the form of false cuttings and barriers. • Introduction of noise and traffic movement. • Introduction of ITS gantries with maintenance lay-bys. • Introduction of access road to the east of the proposed scheme as it crosses the Echline Fields. • Introduction of SUDS detention basin.	Substantial	Moderate

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Medium	Undulating farmland	High	Medium to High	• Mixed woodland planting (mitigation item L41). • Scrub woodland planting (mitigation item L39). • Hedgerow planting (mitigation item L35). • Hedgerow tree planting (mitigation item L35). • Species-rich grassland (mitigation item L42). • False cutting (mitigation item L38). • Replacement stone walls (mitigation item L37).	• Direct adverse impact; large scale, long-term, permanent. • Introduction of new Queensferry Junction. • Introduction of ITS gantries with maintenance lay-bys. • Realignment of A904 at Queensferry Junction. • Introduction of southern route in cutting and at grade. • Realignment of B924 junction with A904. • Creation of A90 Bus Link on embankment and at grade. • Realignment of A8000 bridge over A90. • Introduction of noise and traffic movement.	Substantial	Moderate to Substantial
Low to Medium	South facing slopes	Medium	Low to Medium	• Mixed woodland planting (mitigation item L43). • Scrub woodland planting (mitigation item L44). • Species-rich grassland (mitigation item L45).	• Direct adverse impact; large scale, long-term, permanent • Realignment of Swineburn. • Introduction of slip road on embankment. • Introduction of ITS gantries with maintenance lay-bys. • Introduction of new bridge structure on B9080. • Introduction of SUDS detention basin.	Moderate	Slight to Moderate
Overall Impact Summary							
Medium	All Areas	High	Medium to High	See above.	See above.	Substantial	Moderate to Substantial

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Designed Wooded Landscape: Dundas							
High	All Areas	High	Medium	• Mixed woodland planting (mitigation items L46 & L47). • Standard tree planting (mitigation item L49). • Hedgerow planting (mitigation item L48). • Hedgerow tree planting (mitigation item L50). • Species-rich grassland (mitigation item L51). • Noise barriers in the form of false cuttings and barriers (mitigation items L52 & L53).	• Direct adverse impact; large scale, long-term, permanent. • Introduction of southern route on embankment. • Introduction of ITS gantries and maintenance lay-bys. • Introduction of noise and traffic movement. • Creation of A90 to A8000 Bus Link to south of existing A90 on embankment and at grade.	Substantial	Moderate to Substantial
Urban Area: Kirkliston							
Medium	All areas	Low	Low	• Mixed woodland planting (mitigation items L54 & L55). • Scrub woodland planting (mitigation item L56). • Species rich grassland (mitigation item L57). • Noise barrier (mitigation item L58).	• Direct adverse impact; small scale, medium term, permanent. • Regrading of M9 / M9 Spur embankments and cutting. • Introduction of noise barrier. • Introduction of ITS gantry maintenance lay-by.	Slight	Negligible
Lowland Plain: Overton							
Medium	Large, flat fields	Low to Medium	Low	• Scrub planting around SUDS detention basin (mitigation item L59). • Species-rich grassland (mitigation item L60).	• Direct adverse impact; small scale, long-term, permanent. • Introduction of new slip-road on embankment. • Introduction of SUDS detention basin and access track. • Introduction of ITS gantry maintenance lay-by.	Slight	Negligible to Slight

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Low to Medium	Rising field with existing M9 junction 1A to the east	Low to Medium	Low	• Mixed woodland planting (mitigation item L61). • Scrub woodland planting (mitigation item L62). • Hedgerow planting (mitigation item L63). • Species-rich grassland (mitigation item L64).	• Direct adverse impact; small scale, long-term, permanent. • Introduction of new slip-road on embankment. • Introduction of widened carriageway. • Regrading existing cuttings on M9 and embankments at loop. • Introduction of ITS gantries with maintenance lay-by.	Slight to Moderate	Slight
Overall Impact Summary							
Medium	All areas	Low to Medium	Low	See above	See above	Slight to Moderate	Slight
Designed Wooded Landscape: Newliston							
High	All areas	Low	Low	• Mixed woodland planting (mitigation item L65). • Scrub woodland planting (mitigation item L66). • Species-rich grassland (mitigation item L67).	• Direct adverse impact; medium scale, long-term, permanent. • Regraded embankments. • Introduction of ITS gantry maintenance lay-bys. • Introduction of SUDS detention basins with access tracks.	Slight	Slight
Lowland Plain: River Almond							
Medium to High	All Areas	Low	Low	• Species-rich grassland (mitigation item L68).	• Direct adverse impact; small scale, reducing over time. • Introduction of ITS gantry maintenance lay-bys. • Regraded embankment.	Slight	Negligible to Slight
Industrial: Newbridge							
Low to Medium	All areas	Low	Low	• Scrub woodland planting (mitigation item L69). • Species-rich grassland (mitigation item L70).	• Direct adverse impact; small scale, reducing over time. • Regrading of embankments. • Introduction of ITS gantry maintenance lay-bys.	Negligible to Slight	Negligible

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Existing Road Corridor: A90/M90/M9//M9 Spur							
Low	M9, M9 Spur and A90 South of the Firth of Forth	Low to Medium	Low	Measures identified above for LLCAs adjacent to the southern route, with direct impacts, which also reduce impacts for this LLCA (mitigation items L39-L45, L50, L51 & L54-L70): Mixed woodland planting. Scrub woodland planting. Standard tree planting. Hedgerow planting. Hedgerow tree planting. Species-rich grassland. Noise barrier at Kirkliston.	• Direct adverse impact; large scale, long-term, permanent. • Introduction of A90 to A8000 Bus Link at Ferrymuir and upgraded junction at M9 Junction 1A. • Section of northbound A90 redundant between Scotstoun and Ferrymuir and southbound A90 utilised asA90 Bus Link from Main Crossing to A90 and M9 Spur. • Introduction of slip-roads on embankment and in cutting. • Introduction of ITS gantries with maintenance lay-bys.	Slight	Slight to Negligible

Table 12.21: Summary of Indirect Residual Impacts and LLCAs with no impacts – Southern Route

Sensitivity	Landscape Component/ Aspect	Magnitude of Change		Summary of Mitigation Proposals	Summary of Residual Impacts	Impact Significance	
		Winter Year of Opening	Summer, after 15 years			Winter, year of opening	Summer, after 15 years
Maritime Landscape: Firth of Forth							
High	All areas	Low	Low	• Mixed woodland planting (mitigation item L30). • Scrub woodland planting (mitigation item L31). • Hedgerow planting (mitigation item L29). • Hedgerow tree planting (mitigation item L29). • Noise barriers in the form of false cuttings and barriers (mitigation item L28). • Noise barriers on south viaduct (mitigation item L28).	• Indirect adverse impact; small scale, long-term, permanent. • Introduction of traffic movement and the infrastructure of the south viaduct into landscape setting.	Slight	Slight
Designed Wooded Landscape: Hopetoun							
High	All Areas	Low	Low	• Mixed woodland planting (mitigation item L30). • Hedgerow planting (mitigation item L29). • Hedgerow tree planting (mitigation item L29). • Noise barriers in the form of false cuttings and barriers (mitigation item L28). • Noise barriers on south viaduct (mitigation item L28).	• Indirect adverse impact; medium scale, long-term, permanent. • Introduction of southern route into landscape setting. • Introduction of noise and traffic movement.	Slight	Negligible to Slight
Designed Wooded Landscape: Dalmeny. **Lowland Hill and Valley Farmland: Duloch, Inverkeithing Farmland and Craigbrae.** **Disturbed Farmland: Craigton.** **Wooded Lowland Hill and Valley: North Inverkeithing and Humbie.**					**Industrial Area: Inverkeithing Industrial Estate, South Inverkeithing Bay and Rosyth Industrial Estate.** **Coastal Hill: Letham Hill, Castlandhill and Ferry Hills.** **Coastal Flat: North Queensferry.** **Urban Area: Inverkeithing, Dalgety Bay and North Queensferry.**		
As shown in Tables 12.5 to 12.15.	All areas	No change	No change	None	None	None	None

Note: Summary of Mitigation Proposals – these are measures identified for adjacent LLCAs with direct impacts, which also reduce impacts for LLCAs with indirect impacts.

Summary of Overall Residual Impacts

12.6.33 The proposed scheme would have significant residual impacts for a number of LLCAs. In some cases, LLCAs would be affected by combined impacts from the Main Crossing and the northern or southern routes, which are collectively significant. These findings are outlined below and LLCAs affected by combined impacts summarised in Table 12.22.

12.6.34 At North Queensferry Coastal Flat LLCA, where mixed and scrub woodland planting will provide mitigation by replacing lost woodland, residual impacts of Moderate to Substantial significance would remain from the northern route. Neutral impacts of Slight to Moderate significance from the Main Crossing would also occur at this LLCA.

12.6.35 The most notable effects of the proposed scheme would occur at Ferry Hills, where proposed mitigation to reduce potential impacts includes naturalistic grading of the rock cutting, and planting along embankments and cuttings to replace lost vegetation. However, residual impacts of Substantial significance would remain from the north landing of the Main Crossing and the northern route, which would both cut into the west of this wooded coastal hill. This would affect the setting of Admiralty House and resulting in loss of woodland, altered landform, rock cutting and shading.

12.6.36 The scale of the Main Crossing would be sympathetic to the surrounding landscape and complementary to the form of the Forth Road Bridge and Forth Rail Bridge, with towers which would not dominate the slender towers of the Forth Road Bridge or detract from the familiar setting of the two existing iconic structures. Residual neutral impacts from the Main Crossing would therefore be of Moderate to Substantial significance for the Firth of Forth and Moderate significance for North Queensferry Urban LLCA. Impacts of Slight significance from the southern route would also affect the Firth of Forth LLCA.

12.6.37 At South Queensferry, neutral impacts of Slight to Moderate significance from the Main Crossing would be added to by impacts of Moderate significance from the proximity of the Queensferry Junction and the southern route as it passes the town to the west and south. Duddingston would also be impacted by combined residual impacts of Moderate to Substantial significance from the southern route and Moderate significance from the Main Crossing. These residual impacts take account of the proposed mitigation measures identified for Duddingston, which also reduce impacts for South Queensferry, and include mixed and scrub woodland, hedgerows with and without hedgerow trees, species-rich grassland, false cuttings, noise barriers and replacement stone walls to reflect the adjacent landform and landscape.

12.6.38 Residual impacts for the historic wooded landscape of Dundas LLCA, from the southern route, where proposed mitigation planting with mixed woodland and hedgerows with hedgerow trees would reinstate the landscape pattern and provide screening, assisted by proposed noise barriers in the form of false cuttings and barriers, would be of Moderate to Substantial significance.

12.6.39 Overall, direct residual impacts from the proposed scheme range in significance from Negligible to Substantial, with the residual impacts of Substantial significance limited to the immediate surroundings at the north landing of the Main Crossing at Ferry Hills LLCA.

Table 12.22: LLCAs with combined impacts from the Main Crossing and northern or southern routes, which are collectively significant

LLCA Receptor	Sensitivity	Source of Impact	Impact Winter Year of Opening			Impact Summer 15 Years After Opening		
			Direct/Indirect	Magnitude	Significance	Direct/ Indirect	Magnitude	Significance
Coastal Flat: North Queensferry	Low to Medium	Main Crossing	Indirect	Low to Medium	Slight to Moderate Neutral	Indirect	Low to Medium	Slight to Moderate neutral
		Northern Route	Direct	High	Substantial	Direct	Medium to High	Moderate to Substantial
		Southern Route	None	None	None	None	None	None
Coastal Hill: Ferry Hills	Medium to High	Main Crossing	Direct	High	Substantial	Direct	High	Substantial
		Northern Route	Direct	High	Substantial	Direct	High	Substantial
		Southern Route	None	None	None	None	None	None
Maritime Landscape: Firth of Forth	High	Main Crossing	Direct	Medium to High	Moderate to Substantial Neutral	Direct	Medium to High	Moderate to Substantial neutral
		Northern Route	Indirect	Low	Slight	Indirect	Low	Negligible
		Southern Route	Indirect	Low	Slight	Indirect	Low	Slight
Urban Area: South Queensferry	Medium to High	Main Crossing	Direct	Low to Medium	Slight to Moderate neutral	Direct	Low to Medium	Slight to Moderate neutral
		Northern Route	None	None	None	None	None	None
		Southern Route	Direct	Medium to High	Moderate to Substantial	Direct	Medium	Moderate
Lowland Hill and Valley Farmland: Duddingston	Medium	Main Crossing	Direct	Medium	Moderate	Direct	Medium	Moderate
		Northern Route	None	None	None	None	None	None
		Southern Route	Direct	High	Substantial	Direct	Medium to High	Moderate to Substantial

12.7 Ongoing Design Development

Alternative Construction Compound

12.7.1 An addition to the scheme proposals is the inclusion of an alternative location for the construction compound to the west of South Queensferry. This alternative was identified in response to concerns raised by local residents during the ongoing consultation process, and it locates the compound further to the west.

12.7.2 This alternative site would not alter the assessment provided in this chapter, as landscape impacts during construction are considered separately in Chapter 19 (Disruption Due to Construction).

Ferry Hills Rock Cuts

12.7.3 The proposed scheme design as assessed in this chapter includes significant rock cuts to the north and south of Ferrytoll Junction. Detailed design may allow these rock cuts to be avoided or reduced. Design development indicates that there could be potential for a westward shift of the proposed scheme alignment of up to approximately 15m between approximate chainage ch7500-7800 (southwest of Jamestown) and ch8150-8500 (west of Hope Street Cemetery) to allow the rock cuts to be avoided. Environmental review of this refinement indicates that this could reduce adverse impacts associated with the rock cuts without materially increasing other environmental effects.

12.7.4 If this option were taken forward there would be slightly reduced impacts for Ferry Hills and Inverkeithing Urban LLCA, as impacts on the existing rock cuttings (ch7500-7800 and ch8150-8500) would be avoided. However the overall residual impact on the LLCAs would remain as assessed in this chapter.

12.8 References

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