TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

A96 DUALLING
HARDMUIR TO FOCHABERS

A96 Dualling

Hardmuir to Fochabers scheme

DMRB Stage 2
Scheme Assessment Report

Volume 1 – Part 1
The Scheme

December 2018

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A96 Dualling Hardmuir to Fochabers

DMRB Stage 2 Scheme Assessment Report
Volume 1
Part 1 – The Scheme

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Volume 1 The Scheme and Engineering Assessment

Glossary

1d-2d hydraulic modelling	Dynamically linked one-dimensional computational modelling of a watercourse and two-dimensional computational modelling of the connected floodplain(s).
Aberdeenshire Council Archaeology Service	Provide advice to Moray Council on cultural heritage issues and maintain the Moray Council Sites and Monuments Record (SMR).
Above Ordnance Datum	The mean sea level at Newlyn (UK) used as a base measurement on Ordnance Survey Maps for contours.
Abutment	A structure built to support the lateral pressure of an arch or span, e.g. at the ends of a bridge.
Accommodation Works	Works which the Roads Authority is prepared to carry out during a road contract to accommodate adjoining land owners and to reduce the impact of the road scheme.
Alluvial fan	A mass of sediment deposited at a point along a river where there is a decrease in gradient.
Alluvium	Sediment deposited by a river.
Amenity	Amenity is defined as the relative pleasantness of a journey. It is concerned with changes in the degree and duration of people's exposure to traffic - fear/safety, noise, dirt and air quality and the impact of the road itself.
Ancient Woodland Inventory	A database compiled by Scottish Natural Heritage (SNH) which comprises woodland areas recorded as being ancient, long-established and of semi-natural origin.
Annual Average Daily Traffic	Annual average daily traffic is the total volume in both directions of vehicle traffic of a road for a year divided by 365 days.
Aquifer	A rock formation that is sufficiently porous and permeable to yield a significant quantity of water to a borehole, well or spring. The aquifer may be unconfined beneath a standing water table, or confined by an impermeable or weakly permeable horizon.
Arable Land	Land used for growing crops such as wheat and barley.
Aspirational Core Paths	Paths which have no statutory designation and are recognised as being frequently used and will provide new links with the focus on facilitating active travel and sustainable transport.
At-grade junction	A junction arrangement at which two or more roads meet at the same level.
@Risk	A risk tool which uses the Monte Carlo simulation to produce Quantitative Risk Assessment outputs.
Attenuation	Increase in duration of flow hydrograph with a consequent reduction in peak flow.
Baseline	The environmental conditions against which any future changes can be measured or predicted and assessed.

Bathymetric Survey	Bathymetric surveys allow for the measurement of the depth of a water body as well as map the underwater features of a water body.
Bedrock	Lithified rock that lies beneath a superficial cover of soils and sediments.
Benefit to Cost Ratio	An indicator, used in the formal discipline of cost-benefit analysis that attempts to summarize the overall value for money of a project or proposal. A BCR is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms.
Biodiversity Action Plan	A document that sets out conservation priorities for habitats and species.
Calcareous	Containing calcium carbonate.
Calcite	Very common, widespread, rock-forming carbonate mineral.
Calcsilicate-rock	Rocks rich in calcsilicates; a group of minerals whose bulk composition consists of calcium silicates. Calcsilicate-rocks are commonly formed by the metamorphism of limestones and dolomites.
Catchment	The area contributing flow to a point on a drainage system.
Central Reserve	The area that separates the carriageways of a dual carriageway, exclusive of any hardstrips.
Chert	Variety of very fine-grained crystals of silica that occur as nodules or irregular masses in a sedimentary environment.
Climate	The weather conditions prevailing in an area in general or over a long period.
Climbing Lane	Allow slower travel for large vehicles ascending a steep grade.
Community Land	Public parks and land used for public recreation such as playing fields and woodlands which permit public access.
Conglomerate	Coarse-grained rock with rounded clasts that are greater than 2mm in size.
Conservation	Preservation or restoration of the natural environment and wildlife.
Conservation Area	Conservation Areas are designed to safeguard historic places. They preserve and enhance areas of special architectural or historic interest and are designated under Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
Constructability	A project management technique to review construction processes from start to finish during pre-construction phase. It is to identify obstacles before a project is built to reduce or prevent errors, delays, and cost overruns.
Contaminated Land	The 'Environmental Protection Act 1990' defines Contaminated Land as 'any land which appears to the local authority as to be in such condition, by reason of substances in, on or under the land that (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being, or there is a significant possibility of such pollution being caused'.
Core Paths	The Land Reform (Scotland) Act 2003 requires local authorities to define and map a network of Core Paths. Core Paths can include PRoW, footways, cycleways, tracks, waterways or any other means a person may cross land.

Cross-section	The assembly of the various components of the highway between the highway boundaries, measured at right angles to the line of the highway. The cross-section includes carriageways, central reserve, separator zones, hardshoulders, hardstrips, verges including any footway, cycle track or bridleway, cutting or embankment slopes and berms.
Cultural Heritage	The general term used to describe archaeological remains, historic buildings and historic landscapes.
Culvert	A metal, wooden, plastic, or concrete conduit through which surface water can flow under or across roads.
Cumulative effects	The additive or synergistic effects of the proposed development in conjunction with other developments.
Cutting	Typically where soil or rock material from a landscape is cut out to make way for a section of the route.
Departure from standard	Any variation or waiving of a requirement contained within a DMRB document.
Design Manual for Roads and Bridges	All current standards, advice notes and other documents relating to the design, assessment and operation of trunk roads.
Design Speed	Used to determine the appropriate values of geometric parameters for use in the design of the road alignment.
Detrunking	After the proposed dual carriageway opens, the sections of the existing A96 will no longer be a trunk road.
Digital Terrain Model	A topographical model of the bare earth / underlying terrain of the earth's surface.
Diverge	A link road departing the main carriageway to a subsidiary road or junction.
Do Minimum	The base situation where there are no modifications to the existing road network. May also refer to the minimum modifications, which will necessarily take place in the absence of a proposed scheme.
Do Something (Economic)	The proposed scenario involving construction of a dual carriageway from Hardmuir to Fochabers.
Do Something (Environment and Design)	The proposed scenario involving construction of a dual carriageway from Aberdeen to Inverness.
Double-Tracking	Increasing the capacity of a railway line by having a track running in each direction where before there was only one.
Drey	The nest made by squirrels in trees, which is usually comprised of a bundle of twigs.
Dual Carriageway	A road with a dividing strip between the traffic in opposite directions and usually two or more lanes in each direction.
Earthworks	The moving of soil or rock to reconfigure the topography of a site.
Effect	The result of change or changes on specific environmental resources or receptors.

Electrification	Replacement of traditional diesel trains with trains running on electricity.
Embankment	Typically where compacted soil is used to carry a road or railway line in an area where the existing ground is lower than required.
Embodied Carbon	The amount of carbon released from material extraction, transport, manufacturing and related activities. This may be calculated from cradle to (factory) gate, cradle to (installation) site or from cradle to grave (final point of disposal).
Engineering Fill	Soil which has been selected, placed and compacted to an appropriate specification with the object of achieving a particular engineering performance.
Environmental Risk Assessment	An assessment to determine the risk to identified environmental receptors.
Equestrian	Defined as an equestrian business use of the land including; livery, riding school, trekking centres, stud farms etc but excluding horses kept for personal (non-business use).
Eutrophic	A waterbody rich in nutrients and thus supporting a dense plant population. Decomposition of these plant communities can create anaerobic conditions and kill animal life by depriving it of oxygen.
Existing Local NMU Routes (ELR)	Unlike Core Paths and PRoW these consist of local paths which hold no statutory designation but are routes known to be utilised by Non-Motorised Users.
Feldspathic psammite	A metamorphosed sandstone, rich in the mineral feldspar.
Flood Alleviation Scheme	A strategy involving flood management measures, such as flood walls and banks, with the purpose of reducing flood risk to residential and commercial properties or other sensitive receptors.
Flood Compensation Area	A technique used to mitigate the impact of development in a floodplain by providing alternative flood storage.
Flood Estimation Handbook	Provides the industry-standard methods for assessing flood risk hydrology in the UK.
Fluvial flooding	River flooding, or riverine flooding, occurs when excessive runoff over an extended period of time causes a river to exceed its channel capacity resulting in inundation of the floodplain(s).
Fluvial geomorphology	The study of the physical form of watercourses, including the processes of erosion, sediment transport and deposition and the resultant interaction with the surrounding landscape.
Footprint	The geographical extent of the Scheme.
Forestry Commission Recreational Routes	Routes and trails on the National Forest Estate that link together to form linear recreation features, for example, mountain bike trails or walking trails.
Freeboard	An additional vertical height on top of nominal water levels used in the design of structures to account for possibilities such as rising sea level, insufficient clearance of watercourse debris, wave action and storms.

Garden and Designed Landscape	Sites included on the Register of Gardens and Designed Landscapes as maintained by Historic Environment Scotland.
Geographic Information System	Computer based system for capturing, storing, analysing and presenting spatial or geographic data.
Geogrids	Synthetic material used to reinforce (and stabilise) soils and similar materials.
Geological Conservation Review Site	Sites of national and international importance which show key scientific elements of geology and geomorphology.
Geology	An earth science concerned with the solid earth, the rocks of which it is composed, and the processes by which they change over time.
Glacial Till	That part of glacial drift which was deposited directly by the glacier. It may vary from clays to mixtures of clay, sand, gravel and boulders.
Glaciofluvial	Deposits pertaining to streams fed by melting glaciers, or to the deposits and landforms produced by such streams.
Grade Separated Junction	A junction arrangement that is separated by level from the through carriageway.
Granular	Containing gravel, sand, or silt (coarse grained soil).
Ground Water Dependent Terrestrial Ecosystem	Wetlands and their habitats which critically depend on groundwater flows and /or chemistries.
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Groundwater Body	A distinct volume of groundwater within an aquifer or aquifers as defined under the Water Framework Directive.
Groundwater flooding	Groundwater flooding occurs when the water table in permeable rocks rises to cause flooding above the ground surface.
Headroom	The minimum distance between the surface of the carriageway and a structure.
Heavy Goods Vehicle	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Hectare	1 hectare = 2.471 acres (10,000 square meters).
Heritage asset	The term used to describe a cultural heritage site identified in the assessment.
High Load Route	An advisory route for extremely high abnormal loads.
Hydrogeology	Specialism within geology concerned with underground water, its movement, behaviour and quality.
Hydrology	The scientific study of the movement, distribution, and quality of water and in this context describes the process for the transfer of water as runoff from rainfall in the catchments to watercourses.

Hydromorphology	Hydromorphology (physical characteristics of the watercourse, such as channel width/depth, structure and substrate of the channel bed, structure of riparian zone), as defined by SEPA as part of the WFD. Status can range from 'high', 'good', 'moderate', 'poor' or 'bad', and is updated every year. The 2016 status is the most recent dataset available.
Impact	Potential change attributable to the Scheme on a receptor.
Impermeable	Material that does not allow fluids to pass through it.
Infrastructure	Buildings, structures and facilities used in connection with the operation of farming, forestry, equestrian or sporting activities, including yards, access roads/tracks, slurry/manure stores etc.
Infrastructure Investment Plan	A Scottish Government document that sets out priorities for investment and long–term strategy for the development of public infrastructure in Scotland.
Inscribed Circle Diameter	The inscribed circle is the entire area within a roundabout between all approaches and exits. Its diameter includes the distance across the central island bordered by the outer extent of the circulatory roadway.
Intergranular Flow	Groundwater flow in openings and void space between grains or weathered rock.
Key Landscape Characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
$L_{A10,18h}$	Statistical descriptor of road traffic noise defined as the A-weighted sound pressure level exceeded for 10% of the weekday daytime period 06:00 to 24:00. It is calculated on the basis annual average weekday traffic parameters.
Lacustrine deposits	Deposits formed in the bottom of a lake.
Land Capability for Agriculture	A classification system used to rank agricultural land (into Classes 1 – 7) on the basis of its potential productivity and cropping flexibility.
Land Holding	'Operational unit' which may comprise more than one parcel of land within the locality but is related to the holding in terms of land ownership/occupation.
Land Parcel Identification System	A system whereby land registered with The Scottish Government it is allocated a Land Parcel Identifier (a defined area of land with physical boundaries).
Landscape	An area, as perceived by people whose character is the result of the action and interaction of natural and/or human factors.
Landscape Element	A component part of the landscape or environment (e.g. roads, hedges, woodlands).
Landscape Feature	Particularly prominent or eye-catching elements in the landscape, such as tree clumps, church towers or wooded skylines OR a particular aspect of the scheme proposal.
Landscape and Visual Impact Assessment	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.

Landscape Characteristics	Elements, or combinations of elements, which make a contribution to distinctive landscape character.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another (rather than better or worse).
Landscape value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
LiDAR	A surveying method which measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor.
Listed Building	Structures considered of architectural interest and protected by the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. These are categorised by order of importance (National to Local) as: A Listed; B Listed; and C Listed.
$L_{night,outside}$	The equivalent continuous A-weighted noise level used to describe night-time noise levels over the period 23:00 to 07:00.
Local Biodiversity Action Plan	A plan specific to a local area which outlines threatened species and habitats.
Local Development Plan	A statutory plan for the future development of land, drawn up by the local planning authority in consultation with the community.
Local landscape character area	A local area of distinct, recognisable and consistent landscape characteristics that make one area different from another. LLCAs are identified following more detailed assessment than regional Landscape Character Types and reflect area-specific combinations of landscape characteristics, landscape features and sense of place.
Local Road	An A, B or C classified road (non-Trunk Road) typically operated by a local authority or council.
Long Established of Plantation Origin	A sub-category on the Ancient Woodland Inventory which is Interpreted as plantation from either the 1750 Roy maps or the 1st Edition Ordnance Survey maps of 1860 and have been continuously wooded since.
Made Ground	Area of land that has been constructed by people, such as embankments and spoil heaps on the natural ground surface.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Main Issues Report	A report published by a local authority as the first stage in updating their local development plan. It sets out what the local authority considers to be the main planning issues facing the area and presents general proposals for the area and possible options and alternatives for consultation.
Mainline	The principal road being considered, namely the A96 or the road proposed as its replacement.

Materials Management Plan	A plan which documents how materials anticipated to be in the ground are to be dealt with, including details on potential use, storage areas, intended final destination of the materials, protocols to track movements of these materials and any contingency arrangements (e.g. with regard to treatment of contaminated soils).
Micaceous psammite	A metamorphosed sandstone, rich in mica (clay) minerals.
Mineral (geological) reserves/resources	Naturally occurring solid formed through geological process that has a characteristic chemical composition, a highly ordered atomic structure and specific physical properties.
Mitigation	Measure to avoid, reduce or offset potential adverse impacts.
Moray Cycle Routes	Consist of five cycle routes in the Moray area, promoted by The Cycle Challenge Fund and Moray Council which generally follow the local and trunk road networks.
National Cycle Network	A network of cycle routes across the UK which is maintained by Sustrans. The routes are a combination of minor roads, pedestrian routes, disused railways and traffic calmed routes.
National Forestry Inventory	A record of all woods greater than 0.5ha in size (rural and urban).
National Record of the Historic Environment	The national cultural heritage database as maintained by Historic Environment Scotland.
Native Woodland Survey of Scotland	A field based survey undertaken by Forestry Commission Scotland between 2006 and 2013 to identify and map the location, extent, type and condition of all of Scotland's native woodlands.
Net Present Value	The total present value of a time series of cash flows. It is a standard method for using the time value of money to appraise long-term projects.
New Severance	The severance of communities from community facilities resulting from the physical barrier effect of the new road proposals and any associated amenity or perceived effects and from changes to journeys which are required in order to cross or make detours around the new infrastructure.
Non-Motorised User	The term used to describe walkers, cyclists and equestrians.
Non-organic soils	Soils with an insignificant organic content.
Outdoor Access Areas: Area based facilities	Area based access resources as defined by SNH which include - National Parks, Regional Parks, Country Parks, Geoparks, Munros, areas subject to s.49A Management Agreements including public access, National and Local Nature Reserves, local open space and green infrastructure, Inland lochs and reservoirs and promoted surfing, diving and climbing sites.
Outdoor Access Areas: Linear facilities	Linear access facilities as defined by SNH which include - Core Paths and the wider paths network available through access rights, Long Distance Routes, regional routes, National Cycle Network, Public Rights of Way, Path Orders, Path Agreements (s30 of the Countryside (Scotland) Act and s21 of the Land Reform (Scotland) Act), permissive paths and routes on land where access rights do not apply, and rivers and canals.

Overbearing	This is a term to describe a high level of scale effect, like overpowering or domineering. It occurs where an element appears larger in scale relative to other elements within the surrounding landscape and/or those judged as normal and its presence is perceived as overbearing upon the experience of the landscape as perceived by people.
Pastoral Land	Land used for keeping animals such as cows and sheep.
Peat	An accumulation of partially decomposed organic material, usually formed in waterlogged conditions. Peat soils have an organic layer more than 50cm deep from the soil surface which has an organic matter content of more than 60%.
Perception/ perceived	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Phase 1 Habitat Survey	A rapid method of mapping and recording habitats, this can include botanical species and target notes to show notable features.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Podzols	Acid soils with a grey, leached layer just below the surface and bright orangey-brown coloured subsoils and / or dark brown to black organic rich subsoil.
Portal Frame	Portal frame structures are designed to span between supports and rely on fixed joints with moment resisting capacity where vertical supports connect to horizontal beams or trusses.
Prime Agricultural Land	Land capable of supporting arable agriculture which falls within Land Capability for Agriculture (LCA) Class 1, Class 2 and Class 3.1.
Private Water Supply	Any water supply not supplied by Scottish Water.
Productivity (aquifer)	The potential of an aquifer to sustain various levels of groundwater flow and/or abstraction.
Prominence/ prominent	Prominence refers to the state of being prominent whilst prominent refers to something being particularly noticeable or 'sticking out'.
Prospect - refuge	Prospect-refuge refers to perceived landscape qualities where people experience both opportunity (prospect) and safety (refuge). These qualities are often experienced in the rural landscape at woodland or landform edges to open spaces, where there is both open views and shelter behind. (The prospect refuge theory was first proposed by Jay Appleton in his book: The experience of Landscape, 1975).
Public Rights of Way	Routes which have been used for at least 20 years and which link at least two public areas. ScotWays maintains the National Catalogue of Rights of Way (CROW) with SNH.
Qualitative	Measuring the value of something by its quality rather than a quantity.
Quarry	Area of extracted rock from an open pit site.
Quartzite	A metamorphic rock composed mainly of quartz and usually formed by the metamorphism of quartz sandstones.

Quaternary	The current and most recent of the three periods of the Cenozoic Era in the geologic time scale of the International Commission on Stratigraphy (ICS). Typically defined by the cyclic growth and decay of continental ice sheets.
Raised Marine deposits	Materials deposited in a wave-cut platform, now raised above the present sea-level.
Receptors	Receptors (Landscape & Visual) are aspects of the landscape resource or individuals and/or defined groups of people who have the potential to be affected by a proposal.
Regionally Significant archaeological site	Archaeological sites within the SMR identified as Regionally Significant by ACAS.
Relaxation	A permitted variation of a requirement contained within a DMRB document.
Relief from existing severance	Reduction in existing traffic flows through rural and built up areas leading to improvements in access within a community.
Rural	In, relating to, or characteristic of the countryside rather than the town.
Sanctuary	This refers to a sense of retreat, influenced by distance from and/or little evidence of disturbance. This meaning is different to alternative uses of the term as a place of safety. Areas with perceived sanctuary often have qualities of tranquillity.
Scale	Scale is a word that can be used in a multitude of different ways but, in the context of this assessment, it is used to mean relative size or extent. It is a quality that exists in relation to something else, which may be one of the following: a unit of measure, for example a metre; an object, such as a person, tree or building; or in relation to what we consider as normal.
Schedule 1 (Birds)	Birds which are granted additional protection by the Wildlife and Countryside Act (1981) for which it is an offence to intentionally or recklessly disturb at, on or near an 'active' nest.
Scheduled Monument	Archaeological sites considered Nationally important and protected as Scheduled Monuments by the Ancient Monuments and Archaeological Areas Act 1979.
Scotland's Great Trails	Nationally promoted trails which are at least 25 miles in length and are distinctively waymarked, largely off-road and have a range of visitor services.
Scottish Biodiversity List	A list of animals, plants and habitats which are considered to be of principal importance for biodiversity conservation in Scotland.
Scottish Environment Protection Agency	Scotland's principal environmental regulator responsible for protecting and improving Scotland's environment.
Scottish Natural Heritage	Scottish public body responsible for protecting and promoting the natural heritage of Scotland.
Scottish Transport Appraisal Guidance	Provides a clear and robust framework to identify potential transport interventions.
ScotWays	The UK's oldest outdoor access group who work to protect and develop access to the Scottish Countryside for all. Scotways are also responsible for maintaining the National Catalogue of Rights of Way with SNH.

Semipelite	An aluminium-rich metamorphic rock formed by the metamorphism of clay-rich sedimentary rocks e.g. shales and mudstones.
Sense of place	In LVIA the term is used mainly with regards to place identity and is linked to the concept of genius-loci. A sense of place responds to the physical characteristics of a place and people's experience of this and their interaction with it.
Significance (of effect)	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Site of Special Scientific Interest	Protected sites designated by Scottish Natural Heritage under the Nature Conservation (Scotland) Act (2004). Sites of Special Scientific Interest (SSSIs) are areas of land and water that are considered to best represent Scotland's natural heritage in terms of their: flora – i.e. plants fauna – i.e. animals geology – i.e. rocks geomorphology – i.e. landforms a mixture of these natural features
Site Waste Management Plan	A plan which specifies how waste generated throughout the construction works will be managed and volumes estimated. This includes minimisation, storage, segregation, re-use and final disposal of wastes generated.
Sites and Monuments Record	A record of local archaeological sites, monuments and records which is held by ACAS on behalf of Moray Council.
Soffit	Under surface of the bridge superstructure.
Special Area of Conservation (SAC)	Protected sites that are designated by the Scottish Government under the Habitats Directive (1994). SACs are selected to protect one or more special habitats and/or species – terrestrial or marine.
Special Protection Area (SPA)	Protected sites that are designated by the Scottish Government under the Birds Directive (1992). SPAs are selected to protect one or more rare, threatened or vulnerable bird species, which are listed in Annex I of the Birds Directive, as well as regularly occurring migratory species.
Sporting	Defined as any activity taking place on the land for the purpose of a commercial land-based sporting activity including; fishing, shooting, stalking, horse riding.
spp.	Shorthand notation for species pluralis, the Latin for multiple species. Also used where the genus is known but there is uncertainty over which exact species are present.
Stakeholder	A person with an interest or concern in something.
Stopping Sight Distance	The distance a driver needs to be able to see in order have room to stop before colliding with an object on the carriageway.
Strategic Environmental Assessment	The process by which information about the environmental effects of proposed plans, policies and programmes are evaluated.

Strategic Transport Project Review	A review of the Scottish transport network undertaken by Transport Scotland and published in 2008. It identifies and prioritises road, rail and other interventions of national significance, proposed to be taken forward to improve the network.
Subsidence	Sinking or settling of the ground surface due to natural or anthropogenic causes. Surface material with no free side is displaced vertically downwards with little or no horizontal movement.
Superficial Deposits	The youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back 1.8 million years.
Supplementary Guidance	Detailed policy guidance adopted by a local planning authority that can provide concise and focused detailed policy guidance on specific matters or sites. This supplements the applicable local development plan.
Surface water (pluvial) Flooding	Surface water (pluvial) flooding occurs when precipitation saturates drainage systems and the excess water cannot be absorbed resulting in overland flooding.
Sustainable drainage systems (SuDS)	A natural approach to managing drainage and flood risk in and around properties and other sensitive receptors. SuDS generally work by slowing and holding back the water that runs off from a site and allowing natural processes to breakdown pollutants, thereby having water quality and attenuation functions. Other important functions of SuDS can include aesthetic, landscape and infiltration components.
Target Note	Descriptions of habitats that are too small in area or other interest features that have been identified as part of a Phase 1 Habitat Survey.
Topography	The arrangement of the natural and artificial physical features of an area.
Topsoil	The surface layer of soil.
Tranquillity	A state of calm and quietude associated with peace, considered to be a significant asset of landscape.
Transmission Reducing Station	A facility allowing the reduction in pressure between two gas distribution networks.
Tributary	A river or stream flowing into a larger river or lake.
Trunk Road	Part of the road network connecting major cities, towns, airports and ports for which the Scottish Government is responsible.
Urban	In, relating to, or characteristic of a town or city.
Verge	Any nominally flat area between the edge of the paved carriageway and either the start of an adjacent side slope or, in the absence of a side slope, the highway boundary or bridge parapet.
Visibility	This refers to an ability to see or for something to be seen. The nature of visibility refers to what can be seen, whilst the extent of visibility refers to where something can be seen. Importantly, although visibility influences visual effects, there is not a direct relationship between visibility and visual effects.
Visibility envelope	This illustrates the extent of potential visibility from the driver's eye height.

Vulnerability (groundwater)	The sensitivity of a groundwater system to contamination. Intrinsic vulnerability takes into account the hydrogeological characteristics of an area, but is independent of the nature of the contaminants and the contaminant scenario. Specific vulnerability takes these latter factors into account.
Vulnerable Groups	Defined within the DMRB as the aged, disabled people or children.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Water Framework Directive 2000/60/EC	Introduced in 2000 to establish systems to manage/protect Europe's water environment including rivers, lochs, groundwater, estuaries and coastal waters. This 2000/60/EC legislation is a European Directive which commits European Union Member States to achieve or maintain at least good ecological qualitative and quantitative status for all water bodies by 2015 or over agreed timescales. Waterbodies classified as artificial or heavily modified have to achieve or meet Good Ecological Potential.
Water quality	The chemical, physical, biological and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose.
Zone of Theoretical Visibility (ZTV)	A map (usually produced digitally) showing areas of land from which a development is or would be theoretically visible.

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List of Abbreviations

AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
ARN	Affected Road Network
ATC	Automatic Traffic Count
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BCR	Benefit to Cost Ratio
BGS	British Geological Survey
CEMP	Construction Environmental Management Plan
CO2	Carbon Dioxide
COBALT	Cost and Benefit to Accidents – Light Touch software
CRAM	Corridor Road Assignment Model
CRRN	Compliance Risk Road Network
CRTN	Calculation of Road Traffic Noise
D2AP	Dual 2 Lane Carriageway All Purpose
dB	Decibel
DEFRA	Department for Environment, Food and Rural Affairs
DMDY	Do Minimum Design Year
DMOY	Do Minimum Opening Year
DMRB	Design Manual for Roads and Bridges
DSDY	Do Something Design Year
DSOY	Do Something Opening Year
DTM	Digital Terrain Model
DY	Design Year
EA	Environment Agency

EFT	Emission Factor Toolkit
EIA	Environmental Impact Assessment
ELR	Existing Local NMU Routes
FAS	Flood Alleviation Scheme
FCS	Forestry Commission Scotland
FEH	Flood Estimation Handbook
GCR	Geological Conservation Review Site
GDL	Garden and Designed Landscape
GIS	Geographic Information System
GWDTE	Ground Water Dependent Terrestrial Ecosystem
ha	Hectare
HDV	Heavy Duty Vehicle
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HwLDP	Highland-wide Local Development Plan
IAN	Interim Advice Note
IIP	Infrastructure Investment Plan
IMFLDP	Inner Moray Firth Local Development Plan
IRIS	Integrated Road Information System
IUCN	International Union for Conservation of Nature
km	kilometres
kph	kilometres per hour
kV	Kilovolt
LBAP	Local Biodiversity Action Plan
LCA	Land Capability for Agriculture
LDP	Local Development Plan
LEPO	Long Established of Plantation Origin
LGV	Light Goods Vehicle
LiDAR	Light Detection and Ranging
LLCA	Local Landscape Character Area

LTT	Long Term Trends
LNR	Local Nature Reserve
LPIS	Land Parcel Identification System
LTEA	Lead Traffic Economic Advisor
LVIA	Landscape and Visual Impact Assessment
m	metre
MIR	Main Issues Report
MLDP	Moray Local Development Plan
MMP	Material Management Plan
MMS	Mott Macdonald Sweco
MoU	Measure of Uncertainty
mph	miles per hour
NCN	National Cycle Network
NFI	National Forestry Inventory
NFUS	National Farmers Union of Scotland
NMU	Non-Motorised User
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPV	Net Present Value
NRHE	National Record of the Historic Environment
NWSS	Native Woodland Survey of Scotland
OB	Optimism Bias
OY	Opening Year
PAN	Planning Advice Note
PCM	Pollution Climate Mapping
PCUs	Passenger Car Units
PIA/MVkm	Personal Injury Accidents per Million Vehicle Kilometres
PM10	Particulate matter smaller than 10µm in aerodynamic diameter
PRoW	Public Rights of Way
PVB	Present Value of Benefits

PVC	Present Value of Costs
QUADRO	Queues And Delays at Roadworks
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SMR	Sites and Monuments Record
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSD	Stopping Sight Distance
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Appraisal Guidance
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TEE	Transport Economic Efficiency
TELMoS	Transport/Economic/Land-use Model of Scotland
TMfS	Transport Model for Scotland
TRS	Transmission Reducing Station
TSP	Transport Improvements (identified in the MLDP)
TUBA	Transport Users Benefit Appraisal
VOC	Vehicle Operating Costs
VRS	Vehicle Restraint System
WFD	Water Framework Directive
WWTW	Waste Water Treatment Works
ZTV	Zone of Theoretical Visibility

1. Scheme Background

1.1 Scheme Background

1.1.1. The Scottish Government's Strategic Transport Projects Review (STPR), published in 2008, set out a number of transport priorities for the Aberdeen to Inverness corridor. These transport priorities included: rail enhancements, strategic park and rides, upgrading of the A96 to dual carriageway between Inverness and Nairn, a bypass of Nairn, a new bridge at Inveramsay, and a targeted programme of measures to reduce accident severity.

1.1.2. In December 2011, The Agenda for Cities, "Scotland's Cities: Delivering for Scotland", was published by the Scottish Government. The purpose of his document was to set out the vital contribution that Scotland's major population centres can make in delivering the Government's Economic Strategy. The Agenda identifies connecting cities with strong, reliable and resilient transport infrastructure as a key characteristic to support growth.

1.1.3. Published alongside this in December 2011, was the 2011 Infrastructure Investment Plan (IIP) which provides an overview of the Scottish Government's plans for infrastructure investment over the coming decades. To complement the Agenda for Cities, the IIP contains a commitment to complete the dualling of the A96 trunk road between Inverness and Aberdeen by 2030, thus completing the dual carriageway network between all Scottish cities.

1.1.4. On 9 May 2013 the then Minister for Transport and Veterans set out how the A96 Dualling Programme would be taken forward over the following few years. This announcement identified packages of preliminary design and development work, with the objective of completing the full dualling between Inverness and Aberdeen by 2030.

1.1.5. Since 2013, Transport Scotland has taken forward the preliminary engineering and strategic environmental assessment (SEA) work along the route between east of Nairn and Aberdeen. As part of an on-going rolling programme of engagement on the A96 Dualling Programme the outcome of this preliminary engineering and SEA work was presented at a series of public information exhibitions along the A96 route corridor between Forres and Aberdeen. The exhibitions were held at various venues from 11 May 2015 until 21 May 2015.

1.1.6. Based on the outcome of the preliminary work, it was proposed to progress the next stage of design, i.e. Design Manual for Roads and Bridges (DMRB) Stage 2 assessment, as three geographic sections, in addition to the Inverness to Nairn (including Nairn Bypass) section, which is at a more advanced stage of development. The three sections are proposed on the basis of Western, Central and Eastern Sections (see Figure 1.1 below):

- The Western Section extends from the tie-in of the Inverness to Nairn (including Nairn Bypass) scheme east of Auldearn (at Hardmuir) to east of Fochabers (approximately 46 km);
- The Central Section extends from east of Fochabers to east of Huntly (approximately 31km); and

- The Eastern Section extends from east of Huntly to Craibstone (the proposed A96 junction with the Aberdeen Western Peripheral Route) (approximately 42km).

Figure 1.1: A96 Dualling Programme Sections

1.1.7. In June 2016, Transport Scotland awarded a contract to Mott MacDonald Sweco (MMS) Joint Venture to undertake route options assessment and detailed design work for dualling the western section of the A96 between Hardmuir and Fochabers.

1.2 A96 Aberdeen - Inverness Trunk Road

1.2.1. The scheme location plan is shown on Figure 1.2 (Volume 5). The A96 between Aberdeen and Inverness is approximately 99 miles (160km) long and consists mostly of single carriageway with some overtaking lanes and sections of dual carriageway.

1.2.2. It passes through or nearby the settlements of Nairn, Forres, Elgin, Fochabers, Keith, Huntly, and Inverurie. The remainder of the route is generally through rural settings.

1.2.3. The western and eastern extents of the trunk road have already been upgraded to dual carriageway standard. At Inverness, the dualling extends westwards for less than 1km from Raigmore Interchange to the roundabout at Inverness Retail and Business Park. At Aberdeen, the dualling extends westwards for 20km from Haudagain Roundabout to Port Elphinstone, south-east of Inverurie.

1.2.4. Within the remaining length of single carriageway there are six eastbound overtaking lanes with a combined length of 5.9km and six westbound overtaking lanes with a combined length of 6.3km.

1.2.5. There are approximately 600 at-grade junctions and accesses along the A96 in the rural sections where the national speed limit applies, these include other A-Roads, B-Roads, C-Roads and unclassified roads. There is a grade separated junction with the A9 at Raigmore and two grade separated junctions at Kintore.

1.3 Previous Studies

1.3.1. Previous studies have been undertaken by a number of different parties, which considered issues associated with the improvement of the existing transport network at different levels of detail. The reports of these studies are summarised below. The current route option assessment process has taken consideration of previous studies, reports and consultations, where relevant.

The Strategic Transport Projects Review (STPR), Jacobs, 2008:

1.3.2. The STPR set out 29 investment priorities within an investment hierarchy for the 20 year period following the programme in place at that time. This programme was identified as a means of supporting the National Planning Framework 2 (NPF2) and the government's Purpose. STPR recommended a number of road and rail based interventions to take forward on the Aberdeen to Inverness corridor. Specific trunk road interventions that emerged from the review included upgrading the A96 between Inverness and Nairn to dual carriageway (Intervention 18) and a bypass of Nairn (Intervention 22).

A96 Dualling Inverness to Aberdeen – Strategic Business Case, Transport Scotland, 2014.

1.3.3. This report summarises that the transport planning objectives and the appraisal evidence demonstrates that the options for further improving the transport links between Inverness and Aberdeen over and above existing commitments should be road-based infrastructure interventions. The full dualling of the A96 between Inverness and Aberdeen is the best performing option in terms of the transport planning objectives and the Scottish Transport Appraisal Guidance (STAG) criteria.

A96 Dualling Inverness to Aberdeen – Strategic Environmental Assessment Tier 1 Environmental Report, Halcrow, 2014.

1.3.4. This study identifies base line environmental conditions and constraints. Each STAG option was considered in isolation, providing an assessment of the predicted environmental effects of each option against a reference case, 'Do Minimum' future baseline scenario. A summary impact range of potential effects was used to report the findings in the assessment tables (e.g. 'moderate negative to minor beneficial') to reflect the strategic nature of the assessment.

A96 Dualling Inverness to Aberdeen – Strategic Environmental Assessment Tier 2 Environmental Report, CH2M, 2015.

1.3.5. The aim of the report was to ensure that potential environmental effects are considered from the earliest stages of A96 Dualling Programme development. A comparative assessment was undertaken between those improvement strategy options which provided local alternatives. The findings of the assessment of each improvement strategy option were then reported. The purpose of the appraisal was not to eliminate options from further consideration at this stage; rather, it was intended to help identify key issues, risks and recommendations to inform the development of alternative route alignment options at the next stage of the A96 Dualling design and assessment.

A96 Dualling Inverness to Aberdeen – DMRB Stage 1 Assessment Report, Jacobs, 2015.

1.3.6. This report details the sifting process that was undertaken on the various broadly defined improvement strategies under consideration and resulted in four strategies being progressed to DMRB Stage 1 Assessment. Based on the level of assessment undertaken in this report, it was recommended that all four improvement strategies were worthy of further consideration at the next stage of development (i.e. DMRB Stage 2 Assessment). It was, thereafter, recommended to progress to the next stage of design development of the A96 Dualling Programme as three geographically aligned sections.

1.3.7. The three sections proposed in the Stage 1 report, in addition to the more advanced Inverness to Nairn (including Nairn Bypass), were:

- Western (Hardmuir to Fochabers, approximately 46km);
- Central (East of Fochabers to East of Huntly, approximately 31km); and
- Eastern (East of Huntly to Aberdeen, approximately 42km).

1.3.8. For the western section, the recommended improvement strategies from the DMRB Stage 1 Assessment are shown on Figure 1.3 and described below:

- Improvement Strategy Option B (red) – which follows the general route of the existing A96 corridor with sections offline around the towns of Forres and Elgin; and
- Improvement Strategy Option N (green) – a fully offline alternative to the Option B strategy between Forres and Fochabers removing the need to travel the longer length of the A96 through Forres and Elgin.

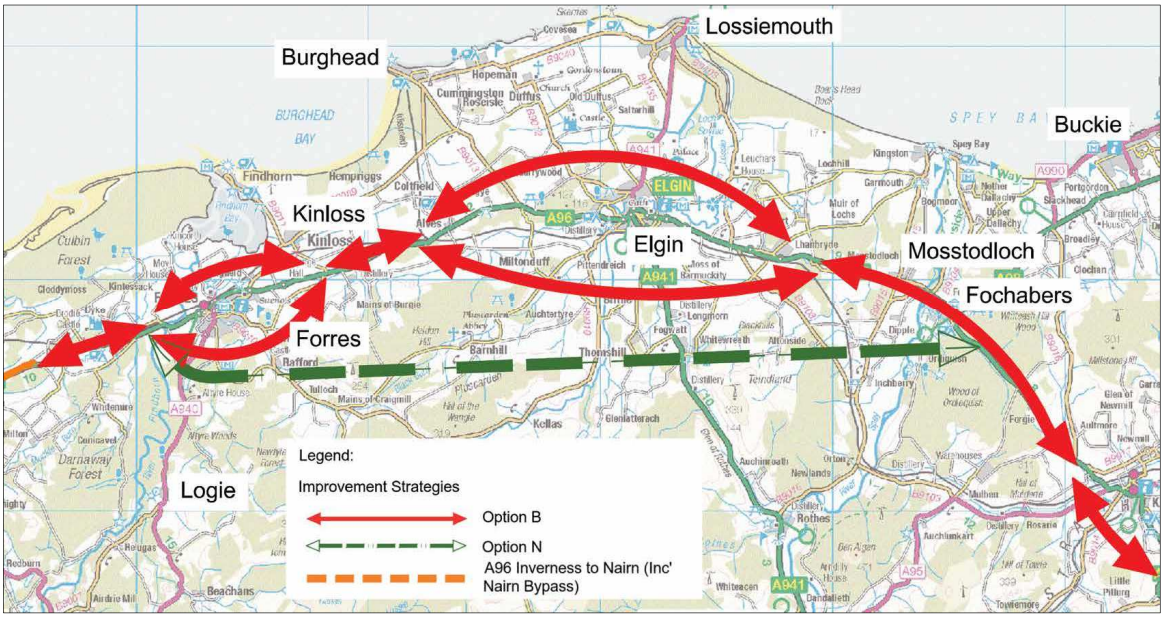

Figure 1.3: Outcome of DMRB Stage 1 Assessment

1.3.9. The Stage 1 report recommended that Stage 2 will involve the identification and detailed assessment of route alignments developed from the broadly defined improvement strategies progressing from the Stage 1 assessment.

1.4 Stakeholders

1.4.1. There are numerous stakeholders with interests in the A96 Dualling Hardmuir to Fochabers Scheme. It is of particular interest to the following stakeholders:

- MSPs, MPs, MEPs and local Councillors.
- Statutory Consultees:
  - Transport Scotland;
  - Moray Council;
  - Highland Council;
  - Highlands and Islands Transport Partnership (HITRANS)
  - Scottish Environment Protection Agency (SEPA);
  - Scottish Natural Heritage (SNH);
  - Historic Environment Scotland (HES);
  - Health and Safety Executive;
  - Marine Scotland; and
  - Network Rail.
- Statutory Undertakers, including:
  - Scottish Water;
  - SSE (formerly known as Scottish and Southern Energy);
  - Scotland Gas Networks (SGN); and

  - Telecommunication companies including BT and Vodafone.
- Non-Statutory Environmental organisations, including:
  - Living Streets Scotland;
  - Royal Society for the Protection of Birds (RSPB);
  - Forestry Commission/Forest Enterprise Scotland; and
  - Spey Fishery Board.
- Other Non-Statutory Consultees, including:
  - Moray Equestrian Access Group;
  - Scottish Orienteering Association;
  - Sustrans; and
  - Moray Chamber of Commerce.
- Community Councils; and
- Landowners, occupiers and tenants within the study area.

1.4.2. The work Transport Scotland is progressing along the A96 corridor includes a rolling programme of regular engagement with local communities and other stakeholders, which started with the public exhibitions held in November 2013. Further public consultations have and will continue to be undertaken as part of the design and development of dual carriageway proposals.

1.4.3. This engagement will help ensure that individuals, communities and businesses affected by the dualling are kept fully informed and consulted, and their feedback taken into account as A96 dualling proposals are developed.

1.5 Current A96 Commissions

A96 Dualling Programme Case for Investment (including Model Strategy Development and Implementation) and Lead Traffic and Economic Advisor

1.5.1. In 2014, Transport Scotland commissioned AECOM to undertake a number of work packages including:

- Developing a corridor model for the A96 to provide an audited model for use by design consultants;
- Developing a Case for Investment for the A96 Dualling Programme; and
- Providing Traffic and Transport Advisor and Auditor Services for Transport Scotland in relation to the A96 Dualling Programme.

A96 Dualling Inverness to Nairn (including Nairn Bypass)

1.5.2. In 2015, Transport Scotland commissioned Jacobs UK Ltd to progress the DMRB Stage 3 assessment for the A96 Dualling Inverness to Nairn (including Nairn Bypass) scheme. The draft Orders and Environmental Statement were published on 29 November 2016.

A96 Dualling East of Huntly to Aberdeen

1.5.3. In 2017, Transport Scotland commissioned AmeyArup to undertake route options assessment and detailed design work for dualling of the eastern section of the A96 between east of Huntly and Aberdeen.

A96 Dualling East of Fochabers to East of Huntly

1.5.4. The route options assessment for the central section of the A96, between east of Fochabers and east of Huntly, is expected to commence in 2019.

1.6 Scheme Objectives

1.6.1. The scheme objectives for the A96 Dualling Hardmuir to Fochabers Scheme are as follows:

- To improve the operation of the A96 and inter-urban connectivity through:
  - Reduced journey times;
  - Improved journey time reliability;
  - Increased overtaking opportunities;
  - Improved efficiency of freight movements along the transport corridor; and
  - Reduced conflicts between local traffic and other traffic in urban areas and strategic journeys.
- To improve safety for motorised and non-motorised users through:
  - Reduced accident rates and severity;
  - Reduced driver stress; and
  - Reduced non-motorised user conflicts with strategic traffic in urban areas.
- To provide opportunities to grow the regional economies on the corridor through:
  - Improved access to the wider strategic transport network; and
  - Enhanced access to jobs and services.
- To facilitate active travel in the corridor.
- To facilitate integration with public transport facilities.
- To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect on:
  - The communities and people in the corridor; and
  - Natural and cultural heritage assets.

1.7 Overview of Stage 2 Report

1.7.1. This DMRB Stage 2 Scheme Assessment Report has been prepared in accordance with DMRB (Volume 5, Section 1, Part 2, TD 37/93, Scheme Assessment Reporting).

1.7.2. The purpose of this report is to document the factors that have been taken into account in the assessment of route options, considering the scheme objectives and the engineering, environmental, traffic and economic advantages/disadvantages and constraints associated with each option.

1.7.3. Whilst following the format prescribed in DMRB (Volume 5, Section 1, Part 2, TD 37/93, Scheme Assessment Reporting) to the extent practicable, the amount of information presented within this DMRB Stage 2 Scheme Assessment Report dictates that it be presented in the following Volumes:

Volume 1 – The Scheme and Engineering Assessment:

- Part 1: The Scheme; and
- Part 2: Engineering Assessment.

Volume 2 – Environmental Assessment:

- Part 3: Environmental Assessment;

Volume 3 – Traffic and Economic Assessment, Assessment Summary and Preferred Option Recommendation:

- Part 4: Traffic and Economic Assessment; and
- Part 5: Assessment Summary and Preferred Option Recommendation.

Volume 4 – Appendices; and

Volume 5 – Engineering, Environmental and Traffic Figures.

1.7.4. This report can be viewed at the Transport Scotland website:

https://www.transport.gov.scot/projects/a96-dualling-inverness-to-aberdeen/a96-hardmuir-to-fochabers/

1.7.5. A bound paper copy of the complete A96 Dualling Hardmuir to Fochabers DMRB Stage 2 Scheme Assessment Report can be purchased (£200) and is also available in DVD format (£10) on application in writing to the "A96 Dualling Team" at Transport Scotland. Applications can be made via email at a96dualling@transport.gov.scot or by post to "MTRIPS Planning and Design, Transport Scotland, Buchanan House, 58 Port Dundas Road, Glasgow, G4 0HF".

2. Existing Conditions

2.1 Introduction

2.1.1. This section of the report describes the engineering conditions of the existing A96 within the scheme extents as shown on Figure 2.1 below.

Figure 2.1: Scheme Extents A96 Dualling Hardmuir to Fochabers

2.1.2. Refer to Figures 2.2, 2.3 and 2.4 (Volume 5) for further details.

2.2 Scheme Location and Environment

Location

2.2.1. The scheme starts at Hardmuir, approximately 5.5 kilometres (km) to the east of Nairn and continues for 46km before it ends approximately 3.1km east of the Fochabers East roundabout. The study area is located between the Moray Firth in the north and the Cairngorms Mountains to the south.

Topography

2.2.2. The land within the vicinity of the existing A96 Aberdeen - Inverness Trunk Road is generally flat and low-lying in nature. This is also the case moving in a northerly direction from the existing A96, towards the coastline of the Moray Firth. To the south of the existing A96 the land gradually rises.

2.2.3. The lowest ground level is less than 8m Above Ordnance Datum (AOD) to the east of Forres. The highest ground level is approximately 140m AOD to the south-east of Fochabers.

Climate

2.2.4. Moray has an oceanic climate resulting in cool summers and relatively mild winters. The study area has a lower than average number of air frost days when compared to the rest of Scotland, as well as a milder average temperature with less extreme highs and lows; the typical annual temperature ranging from 0°C to 17°C. Rainfall in Moray is slightly lower than the national average, ranging from 39 millimetres (mm) to 71mm per month. Moray has more sun hours with a higher fluctuation in daylight hours in comparison to the rest of Scotland (max. 18 hours, min. 7 hours). The average annual windspeed is 19.8kph prevailing in a south-westerly direction (Met Office reports 1981-2010).

Land Use

2.2.5. The land within the study area is principally agricultural in nature. There are also significant woodland areas, transport infrastructure, agricultural properties, residential and commercial entities. The main communities that lie within the corridor include; Forres, Elgin and Fochabers together with smaller communities and settlements.

Agricultural

2.2.6. Within the study area, agriculture, farm woodlands, farm diversification and forestry are the predominant land use, with approximately 90% of land in agriculture, with mixed agriculture being the predominant land use.

2.2.7. There is a mixed farming structure within the study area with some large estates, owner-occupied farms and tenanted farms. There is also a prevalence of farm holdings with a mixed tenure, with an owner-occupied core, but tenanted land, annual lets, winter grazing and contract-farmed land. Many farm holdings are therefore fragmented, comprising multiple parcels of land.

2.2.8. The study area is a very mixed farming area comprising of arable cropping (winter-sown cereals, spring barley for malting and oil seed rape), field scale vegetables (potatoes and carrots), seed potatoes, cattle (suckler cows and feeding cattle), breeding ewes and lambs, pig and poultry production and some dairy. Free range egg and pork production is evident and the conversion to organic status is also evident on some holdings.

Woodland

2.2.9. There are a number of woodland areas which are used for both recreational or commercial purposes, including but not limited to the following: Hardmuir Wood; Darnaway Forest; Monaughty Wood; Quarrelwood; Threapland Wood; Balnacoul Wood; and the Wood of Ordiequish. These being of both commercial plantations and ancient origin.

Transport Infrastructure - Roads

2.2.10. The existing road network is described in section 2.3 using the road names listed in Table 2.1 below.

Table 2.1: List of Roads

Classification	Road Name
A Class Roads	
A96	Existing A96 Aberdeen - Inverness Trunk Road
A98	Fochabers - Cullen - Fraserburgh Road
A940	Market Street, Forres
A941	North Street, Elgin
A941	Hay Street, Elgin
B Class Roads	
B9010	Pluscarden Road
B9011	Forres - Findhorn Road
B9013	Newton - Burghead Road
B9015	Rothes - Kingston Road
B9103	Lossie - Sherrifston - Orton - Mulben Road
B9104	Fochabers - Spey Bay Road
B9104	High Street, Fochabers
C Class Roads	
C1E	Garmouth - Lhanbryde - Fogwatt Road
C1E	St Andrews Road
C4E	Brodieshill - Cloves - Lochinver Road
C5E	East Grange - Spindle Muir Road
C6E	Scotsburn - Kinloss Road
C7E	Brodie - Dyke - Kintessack Road
C8E	Banarach Road
C9E	Brodie - Muirside - Kintessack Road

Classification	Road Name
C Class Roads (continued)	
C10E	Bogs of Dalvey - Earlsmill - Feddan Road
C18E	Sleepieshill Road
C19E	Scotstonhill - Fernyfield Road
C22E	Pansport Road
C22E	Maisondieu Road
C25E	Burghead Road
C26E	Miltonduff - Lochside Road
C27E	Forres Enterprise Park
C30E	Greyfriars Street
C40E	Reiket Lane
Unclassified Roads	
U11E	Balnacoul Road
U19E	Dipple Road
U23E	Loch Oire Road
U58E	Wester Alves Road
U67E	Inchdammie Road
U76E	Barleymill – Tearie Road
U82E	Mundole Road
U96E	Scotsburn - New Forres Road
U97E	Tarras Road
U101E	Church Road
U123E	Moss of Barmuckity Road
U3036	Ellands – Hardmuir – Boghole Road
Unclassified Roads in Forres	
U64E	Benromach Way
U173E	West Road

Classification	Road Name
Unclassified Roads in Forres (continued)	
U173E	Greshop Road
Unclassified Roads in Elgin	
U171E	Ashgrove Road
U171E	Haugh Road
U171E	Hill Street
U171E	Linkwood Way
U171E	Moycroft Road
U171E	North College Street
U171E	North Street
U171E	Oldmills Road
U171E	Pinefield Parade
U171E	Pinefield Road
U171E	Queen Street
U171E	Braelossie Place
U171E	Sheriffmill Road
U171E	Bruceland Road
U171E	Ladyhill Road
U171E	St Giles Road
U171E	Lossie Wynd
U171E	Morriston Road
U171E	Victoria Crescent

2.2.11. The A96 Aberdeen - Inverness Trunk Road is commonly referred to as “the existing A96” throughout this report. Roads other than the existing A96 are described by their classification and road name. Junctions between the existing A96 and other roads listed in Table 2.1 are referenced by their classification, e.g. “the A941 Junction”.

Transport Infrastructure - Railway Lines

2.2.12. The Aberdeen - Inverness Railway Line runs west to east through the study area. It is generally adjacent to the existing A96, including to the north of Forres, through the centre of Elgin and to the south of Lhanbryde.

2.2.13. The railway line passes under the existing A96 to the south-west of Alves. Further details on this structure are provided in Section 2.11.

2.2.14. After the railway line reaches Lhanbryde it runs in a south-easterly direction, diverging away from the A96 before it crosses the River Spey at Boat o' Brig.

2.2.15. The railway line passes through several sections of cutting and embankment as well as over and under several structures and over level crossings as the line interacts with side roads and watercourses.

Residential

2.2.16. The main residential communities are located in Forres, Elgin and Fochabers. The smaller settlements in the study area (as listed in the Moray Local Development Plan (Moray Council, 2015)) include Dyke, Rafford, Kinloss, Alves, Lhanbryde, Urquhart and Mosstodloch.

The populations of the three mains town (from Scotland 2011 Census) are:

- Forres – 12,587;
- Elgin – 23,128; and
- Fochabers – 1,728.

2.2.17. There are also numerous residential properties dispersed across the study area, some of which are situated immediately adjacent to and take direct access from the existing A96.

Commercial and Industrial

2.2.1. There are numerous commercial and industrial properties throughout the study area. While the bulk of these are concentrated within the urban areas of Forres and Elgin, many are also located along the rural sections of the route and often take access directly from the existing A96.

2.3 Existing Road Network

2.3.1. For the purposes of reporting, the existing road network has been divided into five sections based on the rural or urban nature of the route. The extent of the urban sections of the route have been defined as locations where the existing speed limit is 40 miles per hour (mph) or less. From west to east, the sections are:

- Existing A96 west of Forres (rural);
- Existing A96 through Forres (urban);

- Existing A96 between Forres and Elgin (rural);
- Existing A96 through Elgin (urban); and
- Existing A96 east of Elgin (rural).

2.3.2. These sections are shown on Figure 2.5 (Volume 5).

2.3.3. Unless noted otherwise, the existing A96 is a single carriageway of approximate width 7.3m, i.e. two 3.65m lanes.

Geometric Design Standards

2.3.4. An assessment of the existing geometry was undertaken utilising topographical survey information. For the purpose of this assessment it was assumed that the visibility envelope does not extend beyond the back of the verge.

2.3.5. The horizontal geometry, vertical geometry and stopping sight distance (SSD) on the existing A96 were checked against the requirements of Design Manual for Roads and Bridges (DMRB) (Volume 6, Section 1, Part 1, TD 9/93 Highway Link Design) to identify where there are relaxations and departures from standard. A design speed of 100Akph was calculated for the assessment.

2.3.6. For the urban sections detailed in 2.3.1, a 70Akph design speed has been used in accordance with DMRB (Volume 6, Section 1, Part 1, TD 9/93 Highway Link Design, Clause 1.8).

2.3.7. It should be noted that, while there is a speed limit of 50mph through Brodie and a 40mph limit at Alves, due to the short length of these sections within a rural setting a design speed of 100Akph has been adopted for the assessment of departures and relaxations.

2.3.8. The assessment of existing geometric standards is a limited assessment process of the existing road and will not identify every relaxation or departure. It does, however, provide a broad measure of the geometric standard of the existing road.

Junction Design Standards

2.3.9. In appraising the existing junction layouts, the following has been taken into account.

Roundabouts

2.3.10. The DMRB (Volume 6, Section 2, Part 3, TD 16/07 Geometric Design of Roundabouts) provides guidance on the geometric design of roundabouts. The main criteria for roundabout compliance are:

- The lane width at entry to the roundabout shall be between 3.0m and 4.5m;
- The ratio between the width of the circulatory carriageway and the largest entry width shall be between 1.0 and 1.2;
- The entry path radius shall be less than 100m;

- Vehicles approaching the roundabout shall be able to see the junction from a distance corresponding to the desirable minimum SSD for the design speed of the road;
- 15m from the give way line, drivers shall be able to see the full width of the circulatory carriageway, looking forward, for a distance of 40m, 50m or 70m, depending on the Inscribed Circle Diameter of the roundabout. For small roundabouts drivers must see the whole of the circulatory carriageway;
- 15m from the give way line, drivers must be able to see the full width of the circulatory carriageway, looking to the right, for a distance of 40m, 50m or 70m, depending on the Inscribed Circle Diameter of the roundabout. For small roundabouts drivers must see the whole of the circulatory carriageway; and
- When on the roundabout, drivers must be able to see the full width of the circulatory carriageway for a distance of 40m, 50m or 70m, depending on the Inscribed Circle Diameter of the roundabout. For small roundabouts drivers must see the whole of the circulatory carriageway.

Major / Minor Junctions

2.3.11. The DMRB (Volume 6, Section 2, Part 6, TD 42/95 Geometric Design of Major / Minor Priority Junctions) provides guidance on the geometric design of junctions. The main criteria for junction compliance are:

- Drivers approaching a major/minor priority junction along the major road approaches shall be able to see the minor road entry from a distance corresponding to the desirable minimum SSD for the design speed of the major road;
- Drivers approaching from the minor road shall have unobstructed visibility of the junction from a distance corresponding to the desirable minimum SSD for the design speed of the minor road;
- From a point 15m back along the centreline of the minor road measured from the continuation of the line of the nearside edge of the running carriageway of the major road (not from the continuation of the back of the major road hard strip if this is present), an approaching driver shall be able to see clearly the junction form, and those peripheral elements of the junction layout;
- From a point on the minor road, 9m from the nearside edge of the running carriageway of the major road, an approaching driver shall be able to see clearly points to the left and right on the nearer edge of the major road running carriageway at a distance corresponding to the desirable minimum SSD for the design speed of the major road, measured from its intersection with the centreline of the minor road; and
- Where no provision is made for large goods vehicles, it is recommended that the minimum circular corner radius at simple junctions should be 10m in rural areas.

2.4 Existing A96 West of Forres

2.4.1. This section of the existing road network is shown on Figure 2.6 (Volume 5).

Route Description

2.4.2. This section of existing A96 from Wester Hardmuir Farm passes several local and private accesses for approximately 3km to the C9E junction at Brodie. This section incorporates a

600m length of westbound climbing lane immediately to the west of the C10E junction at Feddan.

2.4.3. From the C9E junction in the centre of Brodie the route continues towards Forres, 4.7km to the east. The Aberdeen - Inverness Railway Line runs approximately parallel to the north of the existing A96 over the majority of this section. The existing A96 crosses the River Findhorn 1km to the west of Forres before meeting the Greshop Industrial Estate Roundabout at the western edge of the town.

Speed Limits

2.4.4. The speed limits for this section of the existing A96 are shown on Figure 2.6 (Volume 5).

2.4.5. The existing A96 west of Forres is subject to the national speed limit other than where described below:

- Travelling east from Hardmuir to Forres there is a reduction to 50mph, 400m west of the C9E junction, for a distance of 550m, through Brodie.
- After exiting Brodie to the east, the speed limit returns to the national speed limit before reaching a 40mph zone approaching Forres. The 40mph zone starts just west of the Greshop Industrial Estate Roundabout.

Geometric Design Standards

2.4.6. An assessment of existing design standards was undertaken as set out in section 2.3 above.

2.4.7. A total of 27 relaxations and 28 departures from standard have been identified within this section, comprising:

- Eight relaxations from desirable minimum standards to the horizontal geometry, none of which constitute departures from standard;
- Eight relaxations from desirable minimum standards to the vertical geometry, all of which constitute departures from standard as they are on approach to a junction;
- Eleven relaxations from desirable minimum standards to the SSD, all of which constitute departures from standard as they are on approach to a junction; and
- Nine departures from standard caused by the non-permitted combination of relaxations to horizontal, vertical, and SSD.

Junction Provision

2.4.8. Table 2.2 below, details the outcome of the assessment of major/minor priority junctions along the existing A96 west of Forres. Due to the large number of private accesses only junctions with public roads included within Highland Council and Moray Council list of roads have been assessed.

2.4.9. The location of the junctions is shown on Figure 2.2 (Volume 5) and are described from west to east below.

Table 2.2: Major/Minor Priority Junctions – Existing A96 west of Forres

Junction	Compliance to TD 42/95 Standards				
	Radius	Major SSD	Minor SSD	15m Visibility	9m Visibility
U3036 Ellands – Hardmuir – Boghole Road Junction (West)	×	✓	✓	✓	×
U3036 Ellands – Hardmuir – Boghole Road Junction (East)	×	✓	×	✓	✓
C10E Bogs of Dalvey - Earlsmill - Feddan Road Junction (West)	✓	✓	✓	✓	✓
C9E Brodie - Kintessack Road Junction	✓	✓	×	✓	×
U76E Barleymill - Tearie Road Junction	✓	✓	✓	✓	✓
C10E Bogs of Dalvey - Earlsmill - Feddan Road Junction (East)	✓	✓	×	✓	×
C8E Banarach Road Junction	✓	×	×	✓	×
C7E Brodie - Dyke - Kintessack Road Junction	✓	✓	×	✓	✓
U82E Mundole Road Junction	✓	×	×	×	×

2.4.10. There are no roundabouts along the existing A96 west of Forres.

U3036 Ellands – Hardmuir - Boghole Road Junction (West)

2.4.11. This is a simple T-junction connecting to the U3036, north of the existing A96, which provides access to Easter Hardmuir.

U3036 Ellands – Hardmuir – Boghole Road Junction (East)

2.4.12. This is a simple T-junction connecting to the U3036, south of the existing A96, which provides access to Hardmuir Wood and several properties located to the south. There is a private access opposite the junction, approximately 20m to the west which provides access to a local property.

C10E Bogs of Dalvey - Earlsmill - Feddan Road Junction (West)

2.4.13. This is a ghost island T-junction with right turn lane connecting to the C10E, south of the existing A96, providing access to a number of properties. Opposite the junction and approximately 20m east, there is a field access.

C9E Brodie – Dyke - Kintessack Road Junction

2.4.14. This is a ghost island T-junction with right turn lane connecting to the C9E which provides access to Brodie Castle and surrounding properties to the north of the existing A96. There is a bus lay-by adjacent to the junction for eastbound buses and another approximately 50m east on the opposite side for westbound buses.

U76E Barleymill - Tearie Road Junction

2.4.15. This is a right-left staggered ghost island junction which connects to the U76E, providing access to Dyke to the north and to the Darnaway Forest south of the existing A96. There is a bus lay-by located approximately 50m west of the junction for westbound buses and another approximately 30m east of the junction for eastbound buses.

C10E Bogs of Dalvey - Earlsmill - Feddan Road Junction (East)

2.4.16. This is a simple T-junction connecting to the C10E, providing access to Darnaway, south of the existing A96.

C8E Banarach Road Junction

2.4.17. This is a simple T-junction connecting to the C8E and providing access to Dyke, north of the existing A96.

C7E Brodie - Dyke - Kintessack Road Junction

2.4.18. This is a ghost island T-junction with a right turn lane. The junction connects to the C7E which provides access to Broom of Moy and Kintessack, to the north of the existing A96. There is a bus stop immediately west of the junction for eastbound buses.

U82E Mundole Road Junction

2.4.19. This is a ghost island T-junction with a right turn lane providing access to the U82E to the south of the A96. There is a bus lay-by immediately west of the junction for westbound buses.

2.5 Existing A96 in Forres

2.5.1. This section of the existing road network is shown on Figure 2.6 (Volume 5).

Route Description

2.5.2. This section of the route commences at the Greshop Industrial Estate Roundabout to the west of Forres and continues for 2.9km to the Findhorn Roundabout.

2.5.3. From Greshop Industrial Estate Roundabout, the existing A96 continues through the north of Forres passing through the Greshop Roundabout and south of Forres Railway Station. The route passes the junction of the A940 with a 500m length of single lane dualling before crossing the Burn of Mosset and tying into the Findhorn Roundabout. Over this section, the route also passes several accesses to commercial properties on both the northern and southern sides of the existing A96.

Speed Limits

2.5.4. The speed limits for this section of the existing A96 are shown on Figure 2.6 (Volume 5).

2.5.5. The speed limit within this section continues at 40mph from the Greshop Industrial Estate Roundabout until approximately 300m east of the A940 junction where it returns to the national speed limit.

Geometric Design Standards

2.5.6. An assessment of existing design standards was undertaken as set out in section 2.3 above.

2.5.7. Within this section one relaxation has been identified. This relates to horizontal geometry but is not a departure.

Junction Provision

2.5.8. Table 2.3 below, details the outcome of the assessment of major/minor priority junctions along the existing A96 in Forres. Due to the large number of private accesses only junctions with public roads included within Moray Council list of roads have been assessed. In addition to these priority junctions, there are three existing roundabouts on the A96 within the study area.

2.5.9. The location of the priority junctions and roundabouts are shown on Figure 2.6 (Volume 5) and are described from west to east below.

Table 2.3: Major/Minor Priority Junctions – Existing A96 in Forres

Junction	Compliance to TD 42/95 Standards				
	Radius	Major SSD	Minor SSD	15m Visibility	9m Visibility
A940 Market Street Junction	✓	✓	✓	✓	×
U64E Benromach Way Junction	✓	✓	×	✓	✓

2.5.10. Table 2.4 below, details the outcome of the assessment of roundabouts along the existing A96 in Forres.

Table 2.4: Roundabouts – Existing A96 in Forres

Roundabout	Compliance to TD 42/95 Standards						
	Entry Width Ratio	Entry Lane Width (m)	Entry Path Radius (m)	Approach Visibility (m)	Entry Visibility (m)	Visibility to Right (m)	Circulatory Visibility (m)
Greshop Industrial Estate Roundabout	✓	×	✓	×	✓	✓	✓
Greshop Roundabout	×	×	×	×	✓	✓	✓
Findhorn Roundabout	×	×	✓	×	✓	✓	✓

Greshop Industrial Estate Roundabout

2.5.11. The existing A96 joins a roundabout on the western boundary of Forres which provides access to the Greshop Industrial Estate (via the U173E Greshop Road) to the north and to the Forres Flood Alleviation scheme pump house to the south. A crossing with dropped kerbs is provided within the approach island on the north, west and east arms of the roundabout. Shared use cycleway/footways are provided around the full roundabout.

Greshop Roundabout

2.5.12. This junction is a roundabout connecting to the B9011 Forres - Findhorn Road providing access to Forres. There is also an access into the Greshop Industrial Estate (via the U173E

West Road) on the north side of the roundabout. A crossing with dropped kerbs is provided within the approach island on the north, west and east arms of the roundabout. Shared use cycleway/footways are provided around the full roundabout.

Forres Railway Station Junction

2.5.13. Although not a Moray Council road, the access to the railway station is a key junction. This junction is a T-junction with right turn lane and provides access to Forres station. There is a shared use cycleway/footway that crosses the junction with dropped kerbs and tactile paving on either side of the junction.

A940 Market Street Junction

2.5.14. This is a ghost island T-junction with right turn lane. The junction connects to the A940, which provides access to Forres Town Centre, and further south towards Grantown-on-Spey.

U64E Benromach Way Junction

2.5.15. This is a ghost island T-junction with right turn lane. The junction connects to the U64E which provides access to the side road network north of the Aberdeen – Inverness Railway Line.

Findhorn Roundabout

2.5.16. This junction is a roundabout connecting to the B9011 providing access to Kinloss and Findhorn to the north and Forres Town Centre to the south. Shared use cycleway/footways are provided around the northern and western sides of the roundabout.

2.6 Existing A96 between Forres and Elgin

2.6.1. This section of the existing road network is shown on Figures 2.2 and 2.3 (Volume 5).

Route Description

2.6.2. East of the Findhorn Roundabout, the A96 continues for 1.6km to the Forres Enterprise Park Roundabout. The route then proceeds for a further 6.7km to where it crosses over the Aberdeen - Inverness Railway Line. It passes through the village of Alves 700m to the east of the railway crossing and continues for a further 3.5km to the B9013 junction at Newton. This section also incorporates a 700m length of eastbound climbing lane to the east of Alves.

2.6.3. From the B9013 junction, the route continues 3.3km east to the junction with U171E Morriston Road on the western side of Elgin.

Speed Limits

2.6.4. The speed limits for this section of the existing A96 are shown on Figures 2.6 and 2.7 (Volume 5).

2.6.5. The national speed limit applies throughout this section other than a short stretch in Alves where a 40mph limit applies.

2.6.6. The 40mph limit commences approximately 100m west of the U58E junction and continues for a distance of 600m.

2.6.7. The national speed limit applies until 100m west of U171E Morriston Road junction where a 40mph limit is introduced.

Geometric Design standards

2.6.8. An assessment of existing design standards was undertaken as set out in section 2.3 above.

2.6.9. Within this section a total of 72 relaxations and 57 departures from standard have been identified, comprising:

- Thirteen relaxations from desirable minimum standards to the horizontal geometry, none of which constitute departures from standard;
- Sixteen relaxations from desirable minimum standards to the vertical geometry, 14 of which constitute a departure from standard as they are on approach to a junction;
- Forty-three relaxations from desirable minimum standards to the SSD, 34 of which constitute a departure from standard. Of these departures 31 are on approach to a junction, and three are due to a three-step relaxation; and
- Nine departures from standard caused by the non-permitted combination of relaxations to horizontal, vertical, and SSD.

Junction Provision

2.6.10. Table 2.5 below, details the outcome of the assessment of major/minor priority junctions along the existing A96 in Forres. Due to the large number of private accesses only junctions with public roads included within Moray Council list of roads have been assessed. In addition to these priority junctions, there is one roundabout on the existing A96 within this section.

2.6.11. The location of priority junctions and roundabouts are shown on Figures 2.2 and 2.3 (Volume 5). These are described from west to east below.

Table 2.5: Major/Minor Priority Junctions – Existing A96 between Forres and Elgin

Junction	Compliance to TD 42/95 Standards				
	Radius	Major SSD	Minor SSD	15m Visibility	9m Visibility
U67E Inchdammie Road Junction	×	✓	×	✓	✓
U96E Scotsburn - New Forres Road Junction	✓	×	×	✓	×
C6E Scotsburn - Kinloss Road Junction	✓	✓	×	✓	×
C4E Brodieshill - Cloves - Lochinver Road Junction (West)	✓	✓	×	✓	✓
C5E East Grange - Spindle Muir Road Junction	✓	×	✓	✓	✓
U101E Church Road Junction	✓	×	✓	✓	×
U58E Wester Alves Road Junction	✓	✓	✓	✓	×
C4E Brodieshill - Cloves - Lochinver Road Junction (East)	✓	✓	✓	✓	×
C25E Burghead Road Junction	✓	✓	×	×	✓
B9013 Newton - Burghead Road Junction	✓	✓	×	✓	✓
C26E Miltonduff - Lochside Road (West)	✓	×	×	✓	✓
C26E Miltonduff - Lochside Road (East)	✓	✓	×	✓	×
U171E Morriston Road Junction	✓	✓	✓	✓	✓

2.6.12. Table 2.6 below, details the outcome of the assessment of roundabouts along the existing A96 between Forres and Elgin.

Table 2.6: Roundabouts – Existing A96 between Forres and Elgin

Roundabout	Compliance to TD 42/95 Standards						
	Entry Width Ratio	Entry Lane Width (m)	Entry Path Radius (m)	Approach Visibility (m)	Entry Visibility (m)	Visibility to Right (m)	Circulatory Visibility (m)
Forres Enterprise Park Roundabout	✓	×	×	✓	✓	✓	✓

U67E Inchdammie Road Junction

2.6.13. This junction is a simple T-junction. The junction provides access to the U67E, which connects to the B9011, providing access to Kinloss and Findhorn to the north.

Forres Enterprise Park Roundabout

2.6.14. This junction is a roundabout which provides access to Forres Enterprise Park via the south arm which connects to the C27E Forres Enterprise Park. The north arm is an access to local properties. Shared use footway/cycleways are provided along the south side of the roundabout. Crossings are provided with dropped kerbs on each of the approach islands.

U96E Scotsburn – New Forres Road Junction

2.6.15. This junction is a simple T-junction connecting to the U96E to the south of the existing A96.

C6E Scotsburn - Kinloss Road Junction

2.6.16. This junction is a ghost island T-junction with right turn lane connecting to the C6E. The junction provides access to several local properties and communities such as Kinloss and Findhorn.

C4E Brodieshill - Cloves - Lochinver Road Junction (West)

2.6.17. This is a simple T-junction connecting to the C4E which provides access to Brodieshill to the south of the existing A96.

C5E East Grange - Spindle Muir Road Junction

2.6.18. This junction is a simple T-junction connecting to the C5E. The C5E provides access to local properties.

U101E Church Road Junction

2.6.19. This is a simple T-junction connecting to the U10E, which provides access to properties to the south of the existing A96.

U58E Wester Alves Road / C4E Brodieshill - Cloves - Lochinver Road Junction (East)

2.6.20. This is a ghost island staggered T-junction with right turn lanes. The junction connects to the U58E providing access to properties to the north of Alves and to the C4E providing access to properties to the south of the existing A96. There is a lay-by approximately 20m west of the junction in the westbound direction. There is a shared footway/cycleway to the east of the junction in the eastbound direction. Directly opposite the C4E junction there are dropped kerbs and access to Alves Primary School.

C25E Burghead Road Junction

2.6.21. This is a ghost island T-junction with right turn lane connecting to the C25E. This provides access to many local properties and residential streets. There is a bus lay-by approximately 50m to the east the junction for westbound buses and another 50m to the west of the junction on the opposite side of the road for eastbound buses.

B9013 Newton - Burghead Road / C26E Miltonduff – Lochside Road Junction (West)

2.6.22. This is a ghost island staggered T-junction with right turn lanes connecting to the B9013, to the north and the C26E to the south. There is a bus stop approximately 20m east of the junction for eastbound buses.

C26E Miltonduff - Lochside Road (East)

2.6.23. This is a ghost island T-junction with right turn lane, which connects to the C26E. This junction provides access to Quarrelwood and several other properties to the north of the existing A96.

U171E Morriston Road Junction

2.6.24. This junction is a crossroads with ghost islands and right turn lanes. To the north, U171E connects to the U43E Laverockloch Road, which joins to the B9012 Duffus Road, as well as providing immediate access to the Eight Acres Hotel and Leisure Club and residential streets. To the south, there is access to the Riverside Caravan Park. There is a bus stop directly opposite the junction for westbound buses.

2.7 Existing A96 in Elgin

2.7.1. This section of the existing road network is shown on Figure 2.3 (Volume 5).

Route Description

2.7.2. East of the U171E Morriston Road junction the existing A96 continues for 1.2km to the B9010 Pluscarden Road Roundabout. Thereafter the existing A96 passes through the

centre of Elgin for 4km intersecting eight roundabouts that serve local roads within the town, tying into the C40E Reiket Lane Roundabout at the eastern extent of Elgin. It continues for a further 300m to the point where the existing A96 crosses the Burn of Linkwood. Along this section, there are numerous accesses to commercial, industrial and residential properties.

Speed Limits

2.7.3. The speed limits for this section of the existing A96 are shown on Figure 2.7 (Volume 5).

2.7.4. From the U171E Morriston Road junction, the 40mph continues for 700m before being reduced further to 30mph entering Elgin immediately west of U171E Sheriffmill Road.

2.7.5. The 30mph limit remains through Elgin until 150m east of the roundabout at U171E Moycroft Road. At this point the speed limit increases from 30mph to 40mph and continues for 700m before returning to the national speed limit where the existing A96 crosses the Burn of Linkwood.

Geometric Design standards

2.7.6. An assessment of existing design standards was undertaken as set out in section 2.3 above.

2.7.7. Within this section a total of seven relaxations and four departures from standard have been identified, comprising:

- Three relaxations from desirable minimum standards to the horizontal geometry, none of which constitute departures from standard;
- Two relaxations from desirable minimum standards to the vertical geometry, both constitute departures from standard as they are on approach to a junction;
- Two relaxations from desirable minimum standards to the SSD, both constitute departures from standard as they are on approach to a junction; and
- No departures from standard caused by the non-permitted combination of relaxations to horizontal and, vertical geometry, and SSD.

Junction Provision

2.7.8. Table 2.7 below, details the outcome of the assessment of major/minor priority junctions along the existing A96 in Elgin. Due to the large number of private accesses only junctions with public roads included within Moray Council list of roads have been assessed. In addition to these priority junctions, there are nine roundabouts on the existing A96 within the study area.

2.7.9. The location of priority junctions and roundabouts are shown on Figures 2.2 and 2.3 (Volume 5). These are described from west to east below.

Table 2.7: Major/Minor Priority Junctions – Existing A96 in Elgin

Junction	Compliance to TD 42/95 Standards				
	Radius	Major SSD	Minor SSD	15m Visibility	9m Visibility
U171E Sheriffmill Road Junction	✓	✓	×	✓	×
C22E Wittet Drive Junction	✓	×	✓	✓	×
U171E Braelossie Place	×	✓	✓	✓	×
U171E Bruceland Road Junction	×	✓	✓	×	×
U171E Hill Street Junction	×	✓	✓	✓	×
U171E Ladyhill Road	✓	✓	×	×	×
U171E North Street Junction	✓	✓	✓	✓	×
U171E St. Giles Road	×	×	×	✓	×
U171E North College Street Junction	✓	×	✓	✓	×
U171E Pinefield Road / Victoria Crescent Junction	✓	✓	✓	✓	×
U171E Ashgrove Road Junction	✓	✓	✓	×	×
U171E Pinefield Parade Junction	✓	×	✓	✓	×
U171E Linkwood Way Junction	✓	✓	✓	✓	✓

2.7.10. Table 2.8 below, details the outcome of the assessment of roundabouts along the existing A96 in Elgin.

Table 2.8: Roundabouts – Existing A96 in Elgin

Roundabout	Compliance to TD 42/95 Standards						
	Entry Width Ratio	Entry Lane Width (m)	Entry Path Radius (m)	Approach Visibility (m)	Entry Visibility (m)	Visibility to Right (m)	Circulatory Visibility (m)
B9010 Pluscarden Road Roundabout	×	×	×	×	✓	✓	✓
A941 Hay Street Roundabout	×	✓	×	×	×	×	×
U171E Haugh Road Roundabout	×	✓	×	×	✓	✓	✓
A941 North Street Roundabout	×	✓	×	✓	×	×	×
C30E Greyfriars Street / U171E Queen Street Roundabout	✓	×	×	✓	✓	✓	✓
C22E Pansport Road/ Maisondieu Roundabout	×	×	×	✓	✓	✓	✓
Tyock Industrial Estate Roundabout	✓	✓	×	×	✓	✓	✓
U171E Moycroft Road Roundabout	✓	×	×	✓	✓	✓	✓
C40E Reiket Lane Roundabout	✓	✓	✓	✓	✓	✓	✓

U171E Sheriffmill Road

2.7.11. This junction is a simple T-junction connecting to U171E Sheriffmill Road providing access to residential properties.

C22E Wittet Drive

2.7.12. This is a simple T-junction connecting to C22E providing access to residential properties.

U171E Braelossie Place

2.7.13. This is a simple T-junction connecting to U171E Braelossie Place providing access to residential properties.

U171E Bruceland Road

2.7.14. This is a simple T-junction connecting to U171E Bruceland Road providing access to residential properties.

B9010 Pluscarden Road Roundabout

2.7.15. This junction is a mini roundabout connecting to the B9010, which provides access to the south-west of Elgin. The roundabout also connects to U171E South Street, which provides access to the east of Elgin Town Centre. The northern arm allows access to Elgin Health Centre. Each island also has drop kerbs to allow pedestrians to cross the roundabout.

U171E Hill Street

2.7.16. This is a simple T-junction connecting to U171E Hill Street providing access to local properties.

A941 Hay Street Roundabout

2.7.17. This junction is a roundabout, which connects to the A941 providing access to south of Elgin including connections towards Rothes and further south. Each island also has drop kerbs to allow pedestrians to cross the roundabout.

U171E Haugh Road Roundabout

2.7.18. The junction is a roundabout, which provides access to the leisure centre and football stadium to the north. There is also an access into retail car parking. Shared cycleway/ footway provided along the northside and south-western arm of the roundabout.

U171E North Street

2.7.19. This junction is a simple T-junction which allows vehicles to turn onto the existing A96 from U171E North Street, which is a one-way road. Elgin Bus Station links to U171E North Street. The junction has yellow box markings which allows buses space to turn onto the existing A96.

U171E Ladyhill Road

2.7.20. This is a T-junction with ghost island hatching which connects to U171E Ladyhill Road and provides access to retail car park, Moray Playhouse, and residential properties. No right turn provision is permitted from the existing A96 at this junction and tactile paving is provided on both sides of the junction.

A941 North Street Roundabout

2.7.21. This roundabout joins the existing A96 to the A941, which connects to Lossiemouth in the north. When travelling to the west, prior to the roundabout, there is a junction which allows traffic from U171E Lossie Wynd, a one-way road, to join the existing A96 heading west. There is also an access to the St Giles Centre car park for traffic heading west just after the roundabout. A shared use cycleway/ footway is provided along the northside of the junction. A crossing with dropped kerbs is provided at the approach island on the north arm of the roundabout and there is also a pelican/toucan crossing at the traffic lights to the east of the roundabout.

U171E St. Giles Road

2.7.22. This is a simple T-junction connecting to U171E St Giles Road and provides access to St Giles Centre. No right turn provision is permitted from the existing A96 at this junction. There is a second junction to U171E St. Giles Road, located approximately 50m west of this junction, that provides access (for buses only) to Elgin Bus Station.

U171E North College Street

2.7.23. This junction is a simple T-junction with a yellow box junction in the northside lane. U171E North College Street provides access to Cooper Park and Elgin Cathedral.

C30E Greyfriars Street / U171E Queen Street Roundabout

2.7.24. This junction is a roundabout, which connects the existing A96 to C30E, and U171E Queen Street all to the south of the existing A96. There is a shared use cycleway/footway provided around the full roundabout. Crossings are provided with dropped kerbs on each of the approach islands.

C22E Pansport Road / Maisondieu Road Roundabout

2.7.25. This junction is a roundabout, which connects the existing A96 to C22E Pansport Road to the north and C22E Maisondieu Road to the south. Crossings with dropped kerbs are provided on each of the approach islands. Shared use cycleway/footway encircles the roundabout.

U171E Pinefield Road / Victoria Crescent

2.7.26. This junction consists of two simple T-junctions either side of a central reserve, which splits the two lanes of the existing A96, effectively creating two left-in/left-out junctions. U171E Pinefield Road provides access to local properties to the north whilst U171E Victoria Crescent provides access to properties south of the existing A96. Crossings with drop kerbs are provided at either end of the central reserve. A ghost island continues beyond the extent of the central reserve to the east.

U171E Ashgrove Road

2.7.27. This junction is a ghost island T-junction with right turn lane connecting to U171E Ashgrove Road, which provides access to several residential streets and both industrial and recreational facilities.

Tyock Industrial Estate Roundabout

2.7.28. This junction is a mini roundabout which provides local access to residential streets and the Tyock Industrial Estate to the north of the existing A96. Crossings with dropped kerbs are provided on each of the approach islands.

U171E Moycroft Road Roundabout

2.7.29. This junction is a roundabout which provides access to the Moycroft and Chanonry Industrial Estates to the north of the existing A96. Crossings with drop kerbs are also provided on each of the approach islands. Shared use cycleway/footway encircles the roundabout.

U171E Pinefield Parade Junction

2.7.30. This junction is a ghost island T-junction with a right turn lane for eastbound vehicles and nearside merging taper for westbound vehicles. The junction provides access to and from the Pinefield Industrial Estate and local residential streets, located to the south of the existing A96.

U171E Linkwood Way Junction

2.7.31. This is a ghost island T-junction with right turn lane and nearside merging and diverging taper. The junction provides access to a number of commercial and industrial units in the Linkwood Industrial Estate to the north of the existing A96.

C40E Reiket Lane Roundabout

2.7.32. This junction is a roundabout that connects to C40E which provides access to residential streets to the south of the existing A96. The northern arm provides access to the Linkwood Industrial Estate.

2.8 Existing A96 East of Elgin

2.8.1. This section of the existing road network is shown on Figures 2.3 and 2.4 (Volume 5).

Route Description

2.8.2. East from Elgin, the existing A96 continues for 2.8km passing several local and private access roads to the Lhanbryde West Roundabout. The route continues east, to the south of Lhanbryde and north of the Aberdeen - Inverness Railway Line, tying into the Lhanbryde East Roundabout.

2.8.3. The route continues for 4.6km passing north of Loch Oire. The route also passes several local and private road junctions before coming to Cowfords Roundabout, west of Mosstodloch.

2.8.4. Cowfords Roundabout marks the start of the existing A96 Fochabers and Mosstodloch Bypass which was completed in 2012. The carriageway provision east of Cowfords Roundabout comprises a wide single 2+1 (WS2+1) configuration in accordance with DMRB (Volume 6, Section 1, Part 4, TD 70/08 Design of Wide Single 2+1 Roads) providing overtaking in the eastbound direction for approximately 700m before entering the 300m long changeover to westbound overtaking, which continues for 700m to Coul Brae Roundabout.

2.8.5. The routes proceeds for 800m between Coul Brae Roundabout and Spey Bay Roundabout. This section of single carriageway crosses the River Spey.

2.8.6. East of Spey Bay Roundabout, the road reverts back to WS2+1 configuration with eastbound overtaking for 550m, and a 300m changeover to 600m westbound overtaking which continues to Fochabers East Roundabout.

2.8.7. After Fochabers East Roundabout the existing A96 continues with an eastbound climbing lane for 2km before returning to two lane single carriageway to the end of this section.

Speed Limits

2.8.8. The speed limits for this section of the existing A96 are shown on Figures 2.7 and 2.8 (Volume 5).

2.8.9. The national speed limit applies until immediately after the Coul Brae Roundabout where a speed limit of 40mph applies for a length of approximately 750m, terminating on approach to Spey Bay Roundabout.

2.8.10. The national speed limit applies for the remainder of the existing A96 to the eastern extent of the scheme.

Geometric Design standards

2.8.11. An assessment of existing design standards was undertaken as set out in section 2.3 above.

2.8.12. Within this section a total of 50 relaxations and 37 departures from standard have been identified, comprising:

- Eight relaxations from desirable minimum standards to the horizontal geometry, none of which constitute departures from standard;
- Eleven relaxations from desirable minimum standards to the vertical geometry, nine of which constitute a departure from standard as they are on approach to a junction;
- Thirty-one relaxations from desirable minimum standards to the SSD, 20 of which constitute a departure from standard as they are on approach to a junction; and
- Eight departures from standard caused by the non-permitted combination of relaxations to horizontal and, vertical geometry, and SSD.

Junction Provision

2.8.13. Table 2.9 below, details the outcome of the assessment of major/minor priority junctions along the existing A96 east of Elgin. Due to the large number of private accesses only junctions with public roads included within Moray Council list of roads have been assessed. In addition to these priority junctions, there are six roundabouts on the existing A96 within this section.

2.8.14. The location of priority junctions and roundabouts are shown on Figures 2.3 and 2.4 (Volume 5). These are described from west to east below.

Table 2.9: Major/Minor Priority Junctions – Existing A96 east of Elgin

Junction	Compliance to TD 42/95 Standards				
	Radius	Major SSD	Minor SSD	15m Visibility	9m Visibility
U123E Moss of Barmuckity Road Junction	✓	✓	×	✓	✓
C19E Scotstonhill - Fernyfield Road Junction	×	✓	✓	✓	×
B9103 Lossie - Sherrifston - Orton - Mulben Road / U123E Moss of Barmuckity Road Junction (West)	×	✓	×	✓	×
B9103 Lossie - Sherrifston - Orton - Mulben Road Junction (East)	✓	✓	×	✓	✓
C1E Garmouth - Lhanbryde - Fogwatt Road Junction	✓	✓	×	✓	✓
U23E Loch Oire Road Junction (West)	×	×	×	×	×
C18E Sleepieshill Road / U23E Loch Oire Road Junction	×	×	×	✓	×
U23E Loch Oire Road Junction (East)	✓	✓	×	✓	✓
U19E Dipple Road Junction	✓	×	✓	✓	×

2.8.15. Table 2.10 below, details the outcome of the assessment of roundabouts along the existing A96 east of Elgin.

Table 2.10: Roundabouts – Existing A96 east of Elgin

Roundabout	Compliance to TD 42/95 Standards						
	Entry Width Ratio	Entry Lane Width (m)	Entry Path Radius (m)	Approach Visibility (m)	Entry Visibility (m)	Visibility to Right (m)	Circulatory Visibility (m)
Lhanbryde West Roundabout	✓	✓	×	✓	✓	✓	✓
Lhanbryde East Roundabout	✓	×	×	✓	✓	✓	✓
Cowfords Roundabout	✓	✓	✓	✓	✓	✓	✓
Coul Brae Roundabout	✓	✓	✓	✓	✓	✓	✓
Spey Bay Roundabout	✓	✓	✓	✓	✓	✓	✓
Fochabers East Roundabout	✓	✓	✓	×	✓	✓	✓

2.8.16. There are also numerous private roads and accesses along the route in addition to these junctions.

U123E Moss of Barmuckity Road Junction

2.8.17. This junction is a ghost island T-junction with a right turn lane for eastbound traffic and westbound traffic is assisted by a diverge lane with a give way at the end. The junction provides access to and from Moss of Barmuckity. There is a bus lay-by located directly opposite the junction for eastbound buses and immediately adjacent to the west of the junction for westbound buses.

C19E Scotstonhill - Fernyfield Road Junction

2.8.18. This junction is a simple T-junction, which provides access to areas to the north of the existing A96.

B9103 Lossie - Sherrifston - Orton - Mulben Road (West) / U123E Moss of Barmuckity Road Junction

2.8.19. This junction is a left-right staggered ghost island junction with right turn lanes. The junction connects to the northbound section of the B9103, which provides access to and from Lossiemouth. There is also access provided to local properties and fields to the south of the existing A96. A shared use cycleway/footway runs along the northern edge of the existing A96 with dropped kerbs at the junction. There is a bus lay-by to the east of the junction for westbound buses.

B9103 Lossie - Sherrifston - Orton - Mulben Road Junction (East)

2.8.20. The junction is a ghost island T-junction with right turn lane. This junction connects the existing A96 with the southbound section of the B9103.

Lhanbryde West Roundabout

2.8.21. This junction is a roundabout providing access to the C1E St Andrews Road west of Lhanbryde. There is also an access to Easter Coxton Farm to the south. There is a crossing and dropped kerb on the western approach island. A shared use cycleway/footway passes down the western side of the roundabout.

C1E Garmouth - Lhanbryde - Fogwatt Road Junction

2.8.22. The junction is a ghost island T-junction with right turn lane. It connects the existing A96 to the C1E to the south of the existing A96.

Lhanbryde East Roundabout

2.8.23. This junction is a roundabout connecting to the C1E St Andrews Road, providing access to Lhanbryde.

U23E Loch Oire Road Junction (West)

2.8.24. This is a simple T-junction connecting to the U23E, which provides access to a number of local properties south of the existing A96 around Loch Oire.

C18E Sleepieshill Road / U23E Loch Oire Road Junction

2.8.25. This is a staggered left-right junction. To the north, the C18E provides access to Urquhart and Maverston Golf Course. The U23E provides access to nearby properties, south of the existing A96.

U23E Loch Oire Road Junction (East)

2.8.26. This is a simple T-junction connecting to the U23E providing access to nearby properties to the south of the existing A96. There is a shared use footway/ cycleway that begins at the eastern edge of the junction and then crosses over the existing A96 to the northside of the road, approximately 20m east of the junction.

Cowfords Roundabout

2.8.27. Cowfords Roundabout connects to the B9015 Rothes – Kingston Road which provides access to Mosstodloch from the existing A96. To the south, there is also access to Cowfords Farm. A shared cycleway and pathway is provided along the northern and south-western sections of the roundabout.

Coul Brae Roundabout

2.8.28. Coul Brae Roundabout connects the B9015 which provides access to eastern end of Mosstodloch. The B9015 also connects to the south providing access to communities including Inchberry and on to Rothes. The roundabout also provides direct access to a factory and visitors centre.

U19E Dipple Road Junction

2.8.29. This is a left-in/left-out T-junction connecting to the U19E. The junction provides access to and from a number of properties located to the south of the existing A96. There is a shared use cycleway/footway to the north and another one to the east of the junction. A toucan/pelican crossing is located approximately 20m east of the junction.

Spey Bay Roundabout

2.8.30. Spey Bay Roundabout connects the B9104 Fochabers – Spey Bay Road from the north, and the B9104 High Street from the south, to the existing A96. The B9104 connects Fochabers and the existing A96 to communities to the north of Fochabers. The southern arm of the roundabout provides access to Fochabers. There is a shared use cycleway/footway around the western side of the roundabout that continues to B9104 High Street to the south and existing A96 to the west. There is a shared use cycleway/footway around the northern curve of the roundabout that ends at the B9104.

Fochabers East Roundabout

2.8.31. Fochabers East Roundabout connects the A98 to the existing A96 at the eastern end of Fochabers. The western arm of the roundabout provides access to Fochabers. There is a gated private access to the wooded area on the south-east corner of the roundabout.

2.9 Traffic Conditions

Existing Traffic Patterns

2.9.1. All traffic volume data has been obtained from 2016 Automatic Traffic Count (ATC) data provided by Transport Scotland. Transport Scotland place Automatic Traffic Counters in strategic locations on the trunk road network and report the data collected annually allowing locations of heavy and light vehicle traffic flows to be identified. The traffic volume data is summarised in the Table 2.11 below and ATC locations shown on Figure 2.9 (Volume 5).

Table 2.11: Automatic Traffic Counter data - Hardmuir to Fochabers (2016)

Location	ATC Site Reference	2016 Annual Average Daily Traffic (AADT)	AM Peak Hour Flow	PM Peak Hour Flow
Existing A96 Brodie	126401	9,010	720	830
Existing A96 Forres	02038	12,920	960	1,180
Existing A96 Forres to Elgin	NE014	12,950	1,030	1,200
Existing A96 Elgin (West Road)	00019	16,160	1,370	1,610
Existing A96 Elgin (High Street West)	00020	13,210	980	1,200
Existing A96 Elgin (Alexandra Road)	02040	21,070	1,240	1,700
Existing A96 Elgin (Town Centre)	00021	16,340	1,130	1,280
Existing A96 Elgin East Road	00022	21,620	1,750	1,850
Existing A96 Elgin to Lhanbryde	NE006	16,930	1,370	1,620

2.9.2. The lowest traffic flows are recorded on the existing A96 at Brodie. Traffic flows increase towards Elgin, where the highest traffic flows are recorded on the existing A96 Alexandra Road.

Existing A96 Personal Injury Accidents

2.9.3. An analysis of personal injury accident data, obtained from Stats 19 (Transport Scotland, 2017), between 1 January 2012 and 31 December 2016 (5-year period) was carried out to assess current road safety conditions on the Hardmuir to Fochabers section of the existing A96 and to compare current conditions with national trends. Personal injury accidents are classified as fatal, serious or slight, dependent on the most severely injured casualty.

2.9.4. Figures 2.10, 2.11 and 2.12 (Volume 5) show the location and severity of personal injury accidents on the existing A96 across the 5-year period. Fatal accidents (red) are recorded where the level of injuries sustained cause death within 30 days of the accident taking place. Serious accidents (blue) are recorded where a casualty is detained in hospital or sustains fractures, concussion, severe cuts or where death occurs 30 or more days after the date of

the accident. Slight accidents (green) are recorded when a casualty sustains a sprain, bruise or slight cut.

2.9.5. Analysis of the accident data below in Figure 2.13 displays the number and severity of the accidents recorded between 2012 and 2016 on the Hardmuir to Fochabers section of the existing A96.

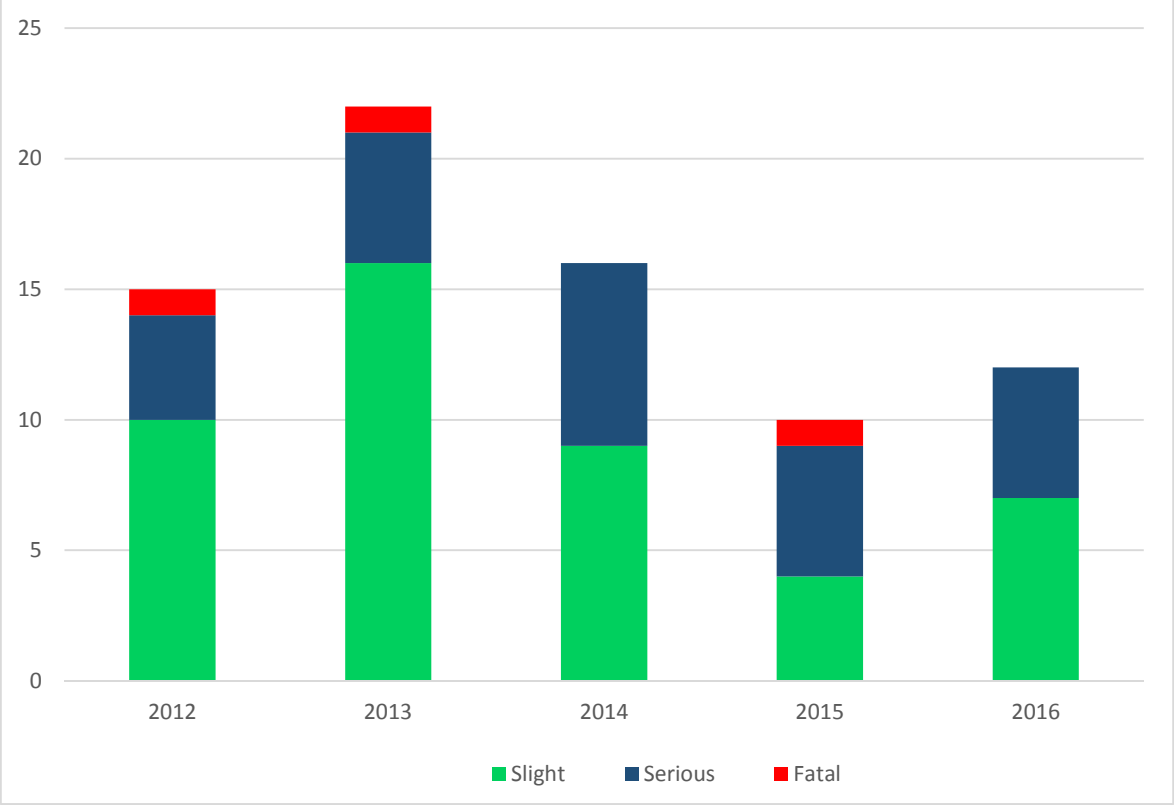

Figure 2.13:A96 Hardmuir to Fochabers Accident Analysis, 2012 - 2016

2.9.6. During the five-year period between 2012 and 2016, 75 accidents were recorded with 46 being slight in nature, 26 serious and three fatal. Key aspects of the data include:

- At least 60% occurred during daylight hours;
- 49% of incidents occurred at or near junctions;
- 27% occurred in Elgin; and
- Ten accidents involved a motorcycle.

2.9.7. Accident data has been divided into the following five sections to correspond to the rural and urban elements. These are:

- Existing A96 west of Forres (rural);
- Existing A96 in Forres (urban);
- Existing A96 between Forres and Elgin (rural);
- Existing A96 in Elgin (urban); and
- Existing A96 east of Elgin (rural).

2.9.8. National accident rates express the number of personal injury accidents per million vehicle kilometres (PIA/MVkm). The rate is dependent on the road type and quality. The current national personal injury accident rate, as defined in DMRB (Volume 15, Section 1, Part 6 The NESA Manual, Chapter 5, Table 6/5/2), for link and junction combined on modern rural single carriageway roads with hard strips is 0.232 PIA/MVkm and urban single is 0.844 PIA/MVkm.

2.9.9. Table 2.12 below provides accident data for sections of the existing A96 between Hardmuir and Fochabers. This indicates that the injury accident rate is below the national average on both rural and urban sections.

Table 2.12: Personal Injury Accidents Per Million Vehicle Kilometres (PIA/MVkm) between Hardmuir and Fochabers.

Location	Existing A96 west of Forres (rural)	Existing A96 in Forres (urban)	Existing A96 between Forres and Elgin (rural)	Existing A96 in Elgin (urban)	Existing A96 East of Elgin (rural)
Link Length (km)	9.1	2.9	15.7	4.5	15.7
Number of injury accidents	11	4	18	20	22
Average AADT (2-way)	9,800	11,800	11,800	17,600	16,700
PIA/MVkm	0.067	0.020	0.092	0.068	0.079

2.9.10. Key findings from the analysis of local accident data on the Hardmuir to Fochabers section of the existing A96 is as follows:

- The highest local accident rate for rural-single roads was 0.092 in comparison with a national rate of 0.293;
- On urban-single sections, the local accident rate did not exceed 0.068 while the national rate is 0.844;
- It can be seen that whilst the accident rates are lower, accident severity is higher than the corresponding national averages:
  - The combined local proportion of serious and fatal accidents for both rural and urban sections of the existing A96 was substantially higher (Rural: >32%; Urban: >40%) than the national proportion (Rural: <25%; Urban: <12%); and
  - While fatal accidents splits for Elgin and East of Elgin were both lower than their national equivalents, the sections of the A96 between Hardmuir and Elgin had a higher rate of fatal accidents comparatively with national levels. The greatest difference with respect to fatal accidents was observed in Forres, where they accounted for 25% (one fatal accident over a total of four accidents) in comparison with 1% nationally.

2.10 Road Pavement Condition

2.10.1. The Integrated Road Information System (IRIS), which is a database operated by Transport Scotland to log and predict the current condition of trunk roads in Scotland, was used to undertake a desk study of the existing A96 pavement condition and layer construction within the study area.

2.10.2. Using the layer construction information provided from the IRIS database, the existing pavement is composed of sections of fully flexible pavement with bituminous layers and flexible composite sections with cement bound granular mixture base. The average thickness of the pavement layer within the study area is 260mm.

2.10.3. Following the desk study of the existing pavement condition, using the IRIS output of deflectograph surveys a summary of the existing pavement residual life, which covers the Scheme extents, is shown in the Table 2.13 below.

Table 2.13: Existing A96 Pavement Residual Life

Residual Life (Years)	% Length of Section	Length of Section (km)
<5	27	14.5
5-9	13	6.8
10-14	12	6.7
15-19	10	5.4
>19	38	20

2.10.4. From Table 2.13, it can be seen that 48% of the existing A96 within the study area has a residual life of at least 15 years. Notably 27% of the existing A96 is approaching critical condition of less than five years residual life.

2.10.5. It must be noted that the level of accuracy available for the existing pavement condition is dependent on the accuracy of the information provided from the IRIS database. A further pavement condition investigation would be required to verify the accuracy of the information obtained from the IRIS database and provide a better understanding of the existing pavement condition.

2.11 Structures

2.11.1. There is a total of 40 structures along this section of the A96 including:

- Eighteen bridges;
- Nineteen culverts; and
- Three retaining walls.

2.11.2. The bridges on this section cross watercourses, railway lines, roads, tracks, and footpaths.

Bridges

2.11.3. A summary of the existing bridges is provided in Appendix A2.1 (Volume 4a). The principal structures of interest are described below. A structure was considered of interest if it included particularly large spans, an unusual form of construction or if a previous inspection had identified high maintenance priority items. The locations of these structures are identified on Figures 2.2, 2.3 and 2.4 (Volume 5).

Findhorn Bridge

2.11.4. Findhorn Bridge, located approximately 1km west of Forres, carries the existing A96 over the River Findhorn. It was constructed circa 1938 and comprises a single span riveted steel arch with secondary transverse steel beams and a reinforced concrete deck. The substructure comprises full height reinforced concrete counterfort supported on mass concrete spread footings. The structure is skewed at approximately 30 degrees, with a span of 90.0 metres.

2.11.5. The most recent Principal Inspection report, issued in 2015 by BEAR Scotland, states that the structure is generally in a reasonable condition. There are a number of maintenance works items, mostly due to the cracking of the concrete copes and deterioration of the movement joints. The cracking in the cope requires remedial work. The movement joints require replacement and defects in the concrete, bearings and steelwork underneath the movement joints require remedial works.

2.11.6. The cross section does not meet current standards required for a rural single carriageway road as per DMRB (Volume 6, Section 1, Part 2 TD 27/05 Cross Sections and Headrooms). The width between kerbs is 8.9m, compared to a requirement of 9.3m. The overall width of the bridge is 12.0m, which meets current standards for the overall carriageway width. The parapets consist of metal parapets comprising three horizontal rails with mesh infill. The height and containment levels are not recorded.

Alves New Rail Bridge

2.11.7. Alves New Rail Bridge, located 0.5km south-west of Alves, carries the existing A96 over the Aberdeen - Inverness Railway Line. It was constructed in 1979 and consists of precast, prestressed concrete beams supporting a reinforced concrete deck. The substructure consists of reinforced concrete abutments and wingwalls, supported on spread footings. The structure has a skew of 56 degrees, a skew span of 19.87m and a square span of 9.95m.

2.11.8. The most recent Principal Inspection report, issued in 2015 by BEAR Scotland, states that the structure is generally in a good condition. The only maintenance works item raised is to replace the approach and departure safety fences.

2.11.9. The cross section does not meet current standards required for a rural single carriageway road. The width between kerbs is 7.3m, compared to a requirement of 9.3m. The overall width of the bridge of 12.3m meets current standards.

2.11.10. The parapets consist of 1.35m high metal parapets consisting of three horizontal rails with mesh infill. This is less than required for the very high containment requirement for structures crossing railway lines.

Alves Old Rail Bridge

2.11.11. Alves Old Rail Bridge, located 0.5 km south-west of Alves, carries a disused, stopped up road over the Aberdeen - Inverness Railway Line. It was constructed in 1900 and consists of a single span skewed brick masonry arch with stone masonry spandrel walls and parapets. The substructure comprises stone masonry abutments and wingwalls supported on spread footings on natural ground. The structure is skewed at approximately 45 degrees, with a square span of 7.98 m.

2.11.12. The most recent Principal Inspection report, issued in 2015 by BEAR Scotland, states that the structure is generally in a poor condition. There are a number of maintenance work items, consisting of masonry repointing and repairs, drainage provision and the installation of bridge waterproofing. The structure does not have approach safety fencing. The masonry parapets are 1.1 metres high. The containment level is not recorded.

Alexandra Footway Bridge

2.11.13. Alexandra Footway Bridge, located in Elgin, carries a pedestrian footpath over the existing A96. It was constructed circa 1978 and comprises a continuous 3 span reinforced concrete deck. The substructure consists of reinforced concrete abutments and reinforced concrete piers, supported on precast reinforced concrete end bearing piles. The bridge foundations are mass concrete spread footings. The structure is skewed at approximately 30 degrees, with a span of 90.0m.

2.11.14. The most recent Principal Inspection report, issued in 2015 by BEAR Scotland, states that the structure is generally in a reasonable condition. There are a number of maintenance works items, mostly due to leaking through the movement joints. The movement joints require replacement and defects in the concrete abutments underneath the movement joints require remedial works.

2.11.15. The minimum headroom meets current standards required for a footbridge. The headroom at the centreline of the carriageway is 5.46m, which complies with the required maintained headroom of 5.41m (except for a high load route). The parapets consist of 1.2m high metal parapets comprising of two horizontal rails with vertical infill.

Fochabers New Bridge

2.11.16. Fochabers New Bridge, located 0.5km west of Fochabers, carries the existing A96 over the River Spey. It was constructed circa 1970 and comprises a two-span continuous structure steel box beam structure with a concrete deck and a reinforced concrete span with

transverse steel beams on top of the west abutment. The east abutment is a full height reinforced concrete cantilever. The west abutment consists of a full height reinforced concrete cantilever wall, behind which is a chamber spanned by reinforced concrete deck. The pier comprises two reinforced concrete columns supported on one reinforced concrete base. The bridge foundations are spread footings. The structure is square with an east river span of 46.7m, a west river span of 61m and an abutment chamber span of 12.2m.

2.11.17. The most recent Principal Inspection report, issued in 2015 by BEAR Scotland, states that the structure is generally in a fair condition. There are several maintenance works items, mostly due to leaking movement joints. The movement joints require replacement and defects in the concrete, bearings and steelwork underneath the movement joints require remedial works.

2.11.18. The cross section meets current standards required for an urban single carriageway road. The width between kerbs is 7.3m. The overall width of the bridge of 10.96m is less than current standards.

2.11.19. The parapets consist of 1m high metal parapets consisting of two horizontal rails with vertical infill. The containment level is not recorded. There are substandard connections between the parapets and the approach safety barriers.

Culverts

2.11.20. There are 19 culverts located on the existing A96 within the study area. A summary of these culverts is located in Appendix A2.2 (Volume 4a).

2.11.21. Only a limited number of inspection reports for the culverts are available. These showed only minor maintenance items required, including provision of pedestrian fencing and approach and departure safety barriers.

Retaining Walls

2.11.22. There are three retaining walls located on the existing A96 within the study area. A summary of these retaining walls is located in Appendix A2.3 (Volume 4a).

2.11.23. The only maintenance item noted in the Principal Inspection reports (issued by BEAR Scotland between 2010 and 2015) for these retaining walls is the replacement of distorted parapet safety fencing on the Alexandra Way Wall.

2.12 Roadside Features

Lay-bys

2.12.1. There is a total of 52 lay-bys, and numerous property frontages between Hardmuir and Fochabers on the existing A96. Of these lay-bys 28 are on the eastbound side and 24 on the westbound side as shown on Figures 2.2, 2.3 and 2.,4 (Volume 5). The location, category and carriageway direction of the lay-bys is detailed in Table 2.14 below:

2.12.2. The lay-by type, Type A or Type B, is as defined in DMRB (Volume 6, Section 3, Part 3, TD 69/07 – The Location and Layout of Lay-bys and Rest Areas).

Table 2.14: Lay-by Location and Type

Approximate Location	Lay-by Type	Direction
60m east of Wester Hardmuir Fruit Farm Access	Bus Lay-by	Eastbound
20m west of Easter Hardmuir Farm Access	Type B	Eastbound
Adjacent to C9E Junction	Bus Lay-by	Eastbound
Opposite to C9E Junction	Bus Lay-by	Westbound
320m west of U76E Junction	Type A	Westbound
40m west of U76E Junction	Bus Lay-by	Westbound
75m east of U76E Junction	Bus Lay-by	Eastbound
380m east of U76E Junction	Type A	Eastbound
300m west of C10E Junction	Type B	Westbound
5m west of U82E Junction	Bus Lay-by	Westbound
165m west of U97E Junction	Type B	Westbound
160m east of Forres Enterprise Park Roundabout	Type B	Eastbound
575m west of U96E Junction	Type B	Westbound
85m east of U96E Junction	Type B	Westbound
150m east of C6E Junction	Type B	Eastbound
20m west of C5E Junction	Type B	Westbound
30m east of C5E Junction	Type B	Eastbound
Opposite Gateside Farm Access	Type B	Westbound
150m east of Gateside Farm Access	Type A	Eastbound
485m east of Gateside Farm Access	Type A	Eastbound
1090m west of U101E Junction	Type B	Eastbound
85m west of C4E Junction	Type B	Westbound
70m west of C25E Junction	Bus Lay-by	Westbound
Adjacent to C25E Junction	Bus Lay-by	Eastbound
455m east of C25E Junction	Bus Lay-by	Westbound

Approximate Location	Lay-by Type	Direction
455m east of C25E Junction	Bus Lay-by	Eastbound
1200m west of B9013 Junction	Bus Lay-by	Eastbound
Opposite to C26E Junction (West)	Bus Lay-by	Eastbound
130m east of C26E Junction (West)	Bus Lay-by	Westbound
165m west of C26E Junction (East)	Type B	Eastbound
1625m east of C26E Junction (East)	Type B	Eastbound
20m east of U171E Bruceland Road Junction	Bus Lay-by	Westbound
90m west of U171E Hill Street Junction	Bus Lay-by	Eastbound
50m east of U171E Hill Street Junction	Bus Lay-by	Westbound
175m east of A941 North Street Roundabout	Bus Lay-by	Eastbound
300m east of A941 North Street Roundabout	Bus Lay-by	Westbound
80m west of C22E Pansport Road Roundabout	Bus Lay-by	Eastbound
120m west of U171E Moycroft Road Roundabout	Bus Lay-by	Eastbound
35m west of U171E Moycroft Road Roundabout	Bus Lay-by	Westbound
115m west of C40E Reiket Lane Roundabout	Bus Lay-by	Eastbound
30m west of C40E Reiket Lane Roundabout	Bus Lay-by	Westbound
360m west of C19E Junction	Bus Lay-by	Westbound
310m west of C19E Junction	Bus Lay-by	Eastbound
385m west of B9103 Junction	Type A	Westbound
65m east of B9103 Junction	Bus Lay-by	Westbound
60m west of C18E Junction	Type B	Eastbound
390m east of U23E Junction	Type B	Eastbound
540m east of U23E Junction	Type B	Eastbound
295m west of U23E Junction (East)	Type B	Westbound
615m east of U23E Junction (East)	Type B	Eastbound
205m east of Coul Brae Roundabout	Bus Lay-by	Eastbound
70m east of U19E Junction	Bus Lay-by	Westbound

Lighting

2.12.3. Road lighting is provided in the verge of the existing A96 at various locations between Hardmuir and Fochabers. Table 2.15 below describes the locations of the existing lighting on the existing A96 and shown on Figures 2.6, 2.7 and 2.8 (Volume 5).

Table 2.15: Street Lighting Locations on Existing A96

Location	Start (approx.)	End (approx.)
Forres	120m west of Greshop Industrial Estate Roundabout	30m east of Burn of Mosset Crossing
Findhorn Roundabout	140m west of roundabout	180m east of roundabout
Forres Enterprise Park Roundabout	135m west of roundabout	130m east of roundabout
Alves	For a length of 610m through the village	
Elgin	150m west of U171E Morriston Road Junction	175m east of C40E Reiket Lane Roundabout
Lhanbryde West Roundabout	260m west of roundabout	165m east of roundabout
Lhanbryde East Roundabout	100m west of roundabout	220m east of roundabout
Cowfords Roundabout	115m west of roundabout	100m east of roundabout
Mosstodloch and Fochabers	55m west of Coul Brae Roundabout	55m east of Spey Bay Roundabout
Fochabers East Roundabout	55m west of roundabout	55m south of roundabout

Vehicle Restraint System

2.12.4. A vehicle restraint system (VRS), or safety barrier, is provided at various locations along the existing A96 between Hardmuir and Fochabers to prevent errant vehicles from hitting hazards. Table 2.16 below shows the approximate locations of the VRS, its length, and the hazard.

Table 2.16: VRS between Hardmuir and Fochabers

Barrier Location	Verge	Length (m)	Hazard
The edge of Brodie, alongside the Old Mill Inn and Caravan Park	Both	350	Embankment
240m east of Old Mill Caravan Park	Westbound	80	Embankment
30m west of U76E Barleymill-Tearie Road Junction	Eastbound	140	Embankment

Barrier Location	Verge	Length (m)	Hazard
425m west of Longley Farm and 160m east of U76E Barleymill-Tearie Road Junction	Eastbound	290	Railway
A96 Speedie Burn Crossing	Both	200	Embankment and Burn
River Findhorn Crossing	Eastbound	215	Embankment and River
River Findhorn Crossing	Westbound	305	Embankment and River
River Findhorn Crossing	Both	80	Embankment and River
Greshop Road Roundabout (west approach)	Eastbound	170	Embankment
Greshop Road Roundabout (east approach)	Eastbound	125	Embankment
35m east of Forres Railway Station entrance	Eastbound	230	Railway
155m east of Forres Railway Station entrance	Westbound	135	Embankment
Burn of Mosset Crossing	Both	45	Watercourse
200m west of Forres Enterprise Park Roundabout	Eastbound	75	Road Sign
Forres Enterprise Park Roundabout	Westbound	55	Embankment
200m east of Forres Enterprise Park Roundabout	Westbound	55	Embankment
East of Alves, bridge over railway	Eastbound	345	Railway
East of Alves, bridge over railway	Both	20	Railway
East of Alves, bridge over railway	Westbound	90	Railway
East of Alves, bridge over railway	Both	20	Railway
B9013 Junction at A96	Eastbound	70	Embankment
East of Elgin, bridge over River Lossie	Westbound	260	Bridge over River Lossie
East of Elgin, Roundabout at Alexandra Road	Eastbound	60	Petrol Station

Barrier Location	Verge	Length (m)	Hazard
Alongside Elgin Bus Station and St Giles Shopping Centre	Westbound	60	Bus station
Burn of Linkwood Crossing Structure	Eastbound	120	Watercourse
Burn of Linkwood Crossing Structure	Westbound	60	Watercourse
210m eastbound of C19E Scotstonhill - Fernyfield Road Junction	Eastbound	30	Embankment
210m eastbound of C19E Scotstonhill - Fernyfield Road Junction	Westbound	31	Embankment
117m eastbound on existing A96 from Southbound B9103 Lossie - Sherrifston - Orton - Mulben Road	Eastbound	95	Watercourse
300m east on existing A96 from Coxton Roundabout	Eastbound	70	Flood Relief
300m east on existing A96 from Coxton Roundabout	Westbound	80	Flood Relief
600m eastbound on existing A96 from West Lhanbryde Roundabout	Eastbound	135	Crash Cushion for Retaining Wall
Parallel to Railway Line through Lhanbryde East Roundabout 140m Westbound of C1E Garmouth - Lhanbryde - Fogwatt Road	Eastbound	80	Watercourse
330m westbound of C1E Garmouth - Lhanbryde - Fogwatt Road	Westbound	220	Watercourse & Railway line
Almost immediate continuation from previous	Westbound	245	Railway
265m west of Cowfords Roundabout	Eastbound	90	Road Sign
Immediately east from Cowfords Roundabout	Westbound	100	Watercourse
960m east of Cowfords Roundabout	Eastbound	105	Pedestrian Underpass
960m east of Cowfords Roundabout	Westbound	105	Pedestrian Underpass
340m west of Coul Brae Roundabout	Eastbound	100	Road Sign

Barrier Location	Verge	Length (m)	Hazard
325m east of Coul Brae Roundabout	Eastbound	135	Pedestrian Underpass
325m east of Coul Brae Roundabout	Westbound	110	Pedestrian Underpass
River Spey Crossing	Eastbound	235	River Spey
River Spey Crossing	Westbound	175	River Spey
Immediately east of Spey Bay Roundabout	Westbound	350	Drainage Pond and Bridge Structure
140m east of Spey Bay Roundabout	Eastbound	220	Bridge Structure
530m west of Fochabers East Roundabout	Eastbound	140	Bridge Structure
530m west of Fochabers East Roundabout	Westbound	140	Bridge Structure
215m west of Fochabers East Roundabout	Eastbound	215	Road Sign and Underpass
125m west of Fochabers East Roundabout	Westbound	125	Road Sign and Underpass
110m south-east of Fochabers East Roundabout	Westbound	85	Road sign
445m south-east of Fochabers East Roundabout	Eastbound	260	Underpass and Cycleway
445m south-east of Fochabers East Roundabout	Westbound	215	Underpass and Embankment
900m south-east of Fochabers East Roundabout	Westbound	170	Wooded Area, Embankment
1100m south-east of Fochabers East Roundabout	Westbound	505	Wooded Area, Embankment
2050m south-east of Fochabers East Roundabout	Westbound	135	Wooded Area, Embankment
2450m south-east of Fochabers East Roundabout	Eastbound	125	Wooded Area, Embankment
2850m south-east of Fochabers East Roundabout	Eastbound	115	Wooded Area, Embankment
2850m south-east of Fochabers East Roundabout	Westbound	115	Wooded Area, Embankment

Signage

2.12.5. All signage along the section of the existing A96 is written in English only. There is one variable message sign located on the eastbound entrance to Elgin. A more detailed assessment of existing signage provision will be undertaken during DMRB Stage 3.

Rest Areas

2.12.6. There are signposted rest areas both eastbound and westbound on the entrance to Forres, Lhanbryde and Fochabers.

2.13 Non-Motorised User Provision

2.13.1. In the existing A96 corridor, the path network comprises a mix of on and off-road paths. The paths are a mix of terrain types from paved path to grassy path and cater for a wide variety of non-motorised users (NMUs) including, pedestrians, cyclists, and equestrians, as well as vulnerable groups. Further baseline information in the options study area is contained in Part 3, Chapter 12 (People and Communities).

2.13.2. Strategic paths include Core Paths, Aspirational Core Paths; Public Rights of Way; Scotland's Great Trails and the National Cycle Networks. Existing Local Routes are paths which have no designation but have been identified through existing data obtained from the DMRB Stage 1 work, site visits and consultation as being important NMU links. The following path types have been identified within the area surrounding the existing A96:

- Public Rights of Way (PRoW) are defined routes which have been used for at least 20 years and which link at least two public areas. ScotWays maintains the National Catalogue of Rights of Way with Scottish Natural Heritage.
- Core Paths - The Land Reform (Scotland) Act 2003 requires local authorities to produce a Core Path plan. The Moray Core Paths Plan (Moray Council, 2011) was adopted in 2011 and aims to provide a framework of Core Paths which is sufficient for the purpose of giving the public access throughout the Moray area. Core Paths can include PRoW, footways, cycleways, tracks, waterways or any other means a person may cross the land.
- Aspirational Core Paths have no statutory designation, unlike Core Paths and PRoW. They are paths that are recognised as being frequently used and are paths the public wishes to see as Core Paths.
- The National Cycle Network (NCN) Route 1 (a long distance cycling route, connecting Dover to the Shetland Islands) follows minor roads to the north of the existing A96 routing to the north of settlements including: Elgin, Forres, Fochabers, Mosstodloch and Lhanbryde. The section of NCN1 to the east of Elgin follows a recently built cycle path which has been incorporated into the Elgin Flood Protection scheme.
- Scotland's Great Trails are nationally promoted trails. Each is distinctively waymarked, largely off-road and has a range of visitor services:
  - The Speyside Way runs from Buckie on the shore of the Moray Firth passing under the existing A96 at Fochabers;

  - The Dava Way is a varied route leading to the Dava summit (320m above sea level) from Forres. The variety of landscapes along the Dava Way make this a popular long-distance walking, equestrian or cycling route; and
  - The Moray Coastal Trail follows a mix of on road and off-road paths and is used by NMUs to access the Moray Coastline from Forres.
- Forestry Commission Recreational Routes – routes and trails on the National Forest Estate that link together to form linear recreation features, for example, mountain bike trails or walking trails.
- Existing Local NMU Routes - Unlike Core Paths and PRoW, local paths hold no statutory designation but are routes known to be utilised by NMUs.

2.13.3. Moray Cycle Routes - The Moray Cycle Routes consist of five cycle routes in the Moray area, three of which are located in close proximity to the existing A96 (Forres Foray, Elgin Experience, and Scenic Speyside). Table 2.17 below describes the footpaths and footways which are within the immediate vicinity of the existing A96 between Hardmuir and Fochabers. In total, 38 routes have been identified. These are shown on Figures 12.1, 12.2 and 12.3 (Volume 5).

Table 2.17: Footpaths/Footways between Hardmuir and Fochabers

Path Reference	Location	Known Users	Description
ELR271	West of Brodie Castle	Pedestrians, Equestrians	Long distance equestrian route via Tearie Farm which crosses the existing A96 at-grade.
CP-FR10-01	Bridge of Findhorn	Pedestrians	Route connecting the communities of Red Craig and Mundole to the north to the River Findhorn and on to Forres.
ELR498	West of Forres	Pedestrians, Vulnerable Groups	Route connecting Greshop Industrial Estate to Pilmuir residential area.
CP-FR28-02	West of Forres Roundabout	Pedestrians	Path connecting Broom of Moy to the A940 Forres – Grantown Road at Balnaferry.
CP-FR30-00	Forres Railway Station	Pedestrians, Cyclists, Vulnerable Users	Path connecting Forres to Forres Railway Station. The crossing point previously connected to the former railway station from Tytler Street. The crossing point has moved east following the relocation of the railway station, however it is still accessed from Tytler Street.
Moray Coastal Trail and CP-FR31-02[1]	South of Benromach Distillery	Pedestrians	Route connects Forres to along the north of the existing A96.

[1] Note: The crossing of the Aberdeen - Inverness Railway Line has been closed, the NMU network will be diverted in this area however no updated data sets noting the route amendments are available at this time.

Path Reference	Location	Known Users	Description
CP-FR14-00	East of Forres	Pedestrians	Route connects the nursery to the north of Forres to the residential areas to the west.
CP-FR15-02	East of Forres	Pedestrians, Cyclists	Grade separated crossing of the existing A96 via an overbridge which connects Forres to the B9014 Forres – Kinloss Road to Kinloss.
ACP22	Forres Enterprise Park	Pedestrians	Connecting route from the Forres Enterprise Park to the Core Path along the existing A96.
ELR35	West of Alves Wood	Pedestrians	Route at the western edge of Alves Wood crossing to the layby.
ELR590	Alves Wood	Pedestrians	Route connecting the north and southern extents of Alves Wood.
ELR565	East of Alves Wood	Pedestrians	Route connects the properties to the north of Alves Wood to the woodland and towards Alves Church.
ELR566	Alves	Pedestrians, Cyclists, Vulnerable Groups	The route provides a connection to the community facilities to the south of Alves.
ELR266	East of Alves	Pedestrians, Cyclists, Vulnerable Groups	NMU route connecting the properties at Carsehill to the bus stops on the existing A96.
ELR51 and The Elgin Experience	West of Quarrelwood	Pedestrians	Path connects the properties Atoll Cottage and Rowan Cottage to the western edge of Quarrelwood.
ELR54, ELR55, ELR630	Quarrelwood	Pedestrians	Paths connecting Aldroughty Wood and Quarrelwood.
ELR629	East of Quarrelwood	Pedestrians	Providing a connection to the River Lossie from the Eight Acres Hotel complex.
ACP67	West of Elgin	Pedestrians	Path connecting C22E Wittet Drive to the existing A96.
CP-EG14-02, ACP65, CP-EG17-00, CP-EG21-00, The Elgin Experience, CP-EG22-00, ACP126, ACP123, ACP118, ACP122	Elgin	Pedestrians, Cyclists, Vulnerable Groups	Crossings of the existing A96 within the urban area of Elgin, some of which are signal controlled.

Path Reference	Location	Known Users	Description
ACP62	C40E Reiket Lane Roundabout	Pedestrians, Cyclists	Properties at Waukmill to the River Lossie.
ELR66	East Elgin at Barmuckity	Pedestrians	Route connects the properties at Barmuckity to the bus stop on the existing A96.
ELR66, ELR571	West Lhanbryde	Pedestrians	Routes which follow the B9013 and the U123 Moss of Barmuckity Road at Sherrifston.
ELR572	South Lhanbryde	Pedestrians, Cyclists	Route south from Lhanbryde following the C1E Garmouth - Lhanbryde - Fogwatt Road.
ACP4	East Lhanbryde	Pedestrians, Cyclists	Route connecting Lhanbryde to the existing A96 which requires crossing at the eastern roundabout at Lhanbryde.
CP-EG52-02	East Lhanbryde	Pedestrians	Route connects Lochnabo Wood to the cemetery at Lhanbryde.
ELR578	Loch Oire / Sleepieshill Wood	Pedestrians	Route following the western side of Sleepieshill Wood to Loch Oire.
ACP4, ELR107	Castlehill Wood	Pedestrians	Providing a connection between Blackdam Wood and Castlehill Wood. A serious accident occurred in 2014.
ELR265	South of Mosstodloch	Pedestrians, Cyclists	Route connecting Mosstodloch to the local road network at Balnacoul Wood via a pedestrian underpass.
ELR467	East of Mosstodloch	Pedestrians, Cyclists	Crossing of the existing A96 at the Coul Brae Roundabout.
CP-FB08-01	Mosstodloch	Pedestrians, Cyclists	Two crossing of the existing A96 comprising a grade separated underpass and a signal controlled at-grade crossing.
CP-SW02-05	River Spey	Pedestrians	Grade separated crossing of the existing A96 which passes under the existing bridges over the River Spey.
Speyside Way	West of Fochabers	Pedestrians, Cyclists	Route which follows the existing road network, and which crosses the existing A96 at the Spey Bay Roundabout.
ELR603	Gordan Castle Estate	Pedestrians, Cyclists	Route which crosses the existing A96 via an overbridge providing access to the Gordon Castle Estate.

Path Reference	Location	Known Users	Description
CP-FB14-01	Access to Gordon Castle Farm	Pedestrians	Route which crosses the existing A96 via an underpass.
CP-FB16-01	East of Fochabers	Pedestrians, Cyclists	Route which crosses the existing A96 via an underbridge to the west of the Fochabers East Roundabout.
ELR393	Moray Monster Trail	Pedestrians, Cyclists	Route which crosses the existing A96 via an underpass providing a connection between the Moray Monster Trail to the east and west of the existing A96.

2.14 Drainage

2.14.1. Road drainage systems for collecting surface water run-off vary along different sections of the existing A96. At some locations, surface water run-off drains naturally to adjacent land. Much of the route comprises edge of carriageway drainage systems including: kerbs and gullies; ditches; filter drains and at several locations combined kerb and drainage systems. These systems connect to sub-surface carrier drains, which discharge positively into the nearest watercourse.

2.14.2. Drainage networks on the Fochabers and Mosstodloch Bypass incorporate Sustainable Drainage Systems features by way of basins as a method of treatment and/or attenuation prior to discharging.

2.14.3. Most junctions along the existing A96 have kerbed edges with surface water run-off collected via gullies, likely connecting directly into the local drainage network via carrier drains.

2.15 Public Utilities

2.15.1. Public utilities have been identified and key utilities are shown on Figures 2.14, 2.15 and 2.16 (Volume 5). Major towns were not included within the utility search as this level of detail is not required in locations that are not affected by any of the route options.

Telecoms

2.15.2. Underground BT cables run adjacent to the existing A96 forming the mainline network between Hardmuir and Fochabers. Similarly, many of the major local roads include underground telecoms cables running adjacent to the carriageway, which in turn connect to the existing A96 network. Many individual underground and overhead cables connect to the mainline network, serving small settlements and residential properties.

2.15.3. A Vodafone telecommunications cable runs adjacent to the existing A96 from Hardmuir, through Forres, Elgin, Fochabers and continues south-east to the end of the study area.

2.15.4. Communication masts are positioned within proximity to the existing A96 within the study area.

Gas

2.15.5. A high-pressure gas pipe is located south of the existing A96 between Hardmuir and Fochabers. The high-pressure gas pipe does not directly interact with the existing A96 but runs adjacent to the existing A96 for a short section west of Forres before diverting south again.

2.15.6. An intermediate pressure gas pipe runs from the south to the north of Elgin crossing the existing A96 within Elgin.

2.15.7. Several shorter pipes branch off the major pipelines, described above, to serve smaller settlements within the study area.

Electricity

2.15.8. SSE's 132kV, 33kV, 22kV and 6.6-11kV cables are present both over ground and underground within the study area. The 132kV overhead lines cross the existing A96 at the Forres Enterprise Park, east of Alves and east of Elgin, after which it runs parallel to the existing A96 before diverting south-east. The 33kV, 22kV and 6.6-11kV cables cross the existing A96 both over and under at several locations but do not run adjacent to the existing A96 for any significant period of length.

Water Supply and Sewerage

2.15.9. There are several water supply pipes within the study area including a water main that runs adjacent to the existing A96 between Forres and Alves. Another main runs adjacent to the existing A96 from Elgin to Mosstodloch. There are several mains that cross the existing A96 at several locations. The pipes that cross the existing A96 branch off from the mainline pipes, which provide water to small communities and isolated residents. To the east of Fochabers, there is a Scottish Water covered reservoir, with access taken from the A98.

2.15.10. There are two waste water treatment works (WWTW) that have been identified between Hardmuir and Fochabers. These WWTWs are situated north of Forres and north of Mosstodloch.

2.15.11. Several private water supplies have been identified between Hardmuir and Fochabers and these are discussed in Part 3, Chapter 19 (Geology, Soils, Contaminated Land and Ground Water) of this report.

2.16 Bus Services

2.16.1. Several bus companies use the existing A96 between Hardmuir and Fochabers. Stagecoach is the main operator, but local services including: Kineil Coaches; Deveron Coaches; and Maynes Coaches also operate within the study area.

2.16.2. Stagecoach services along the A96 corridor include the following numbered routes: 10; 10A; 10B; 31; 31D; 32; 33A 33C; 34; 34S (School run); 35; 36; and 38. These routes utilise the existing A96, B9011 Forres – Findhorn Road, C1E St Andrew's Road, B9015 Rothes – Kingston Road, B9104 - High Street, C6E Scotsburn - Kinloss Road, U171E Haugh Road, A941 North Street, C22E Pansport Road, C22E Maisondieu Road, U171E Pinefield Parade, C40E Reiket Lane and the A98 Fochabers - Cullen - Fraserburgh Road. These bus services are summarised in Table 2.18 below.

Table 2.18: Bus services along existing A96 corridor

Bus Operator	Route Number	Summary of Route
Stagecoach	10	Inverness to Aberdeen
Stagecoach	10A	Inverness to Aberdeen
Stagecoach	10B	Inverness to Aberdeen
Stagecoach	31	Forres to Findhorn
Stagecoach	31D	Elgin to Findhorn
Stagecoach	32	Elgin to Burghead
Stagecoach	33A	Elgin to Lossiemouth
Stagecoach	33C	Elgin to Lossiemouth
Stagecoach	34	Elgin Town Centre
Stagecoach	34S	Elgin Town Centre
Stagecoach	35	Elgin to Buckie
Stagecoach	36	Elgin to Dufftown
Stagecoach	38	Elgin to Buckie

2.16.3. Kineil Coaches operate a single service, route number 312, on school days only. This service operates in and around Forres and uses the A940 south of Forres but does not interact directly with the existing A96.

2.16.4. Deveron Coaches operate several services that interact with the existing A96 in the locality of Elgin Town Centre. These services are the following route numbers: 340; 341; and 363 and utilise part of the existing A96 with access and egress at junctions with the U171E South Street and the B9010 Pluscarden Road.

2.16.5. Maynes Coaches operate a single service, route number 590, on school days only. The service commences opposite the high school, Lossiemouth, and terminates at St Sylvester's Primary, Elgin. The existing A96, U171E North College Street and C30E Greyfriars' Street are utilised as part of this service.

2.16.6. Moray Council also provides the 334 and 366 bus services. The 334 service utilises part of the existing A96 with access and egress at junctions with C22E Maisondieu Road, Elgin and the C1E St Andrews Road, Lhanbryde. The 366 service utilises part of the existing A96 with access and egress at junctions with the A941 and U171E South Street, Elgin.

2.16.7. Additionally, Moray Council run a 'Dial M for Moray' scheme, which operates several 'stop on demand' services during weekdays. These services pick up and drop off passengers at a location of the passenger's request. These drop off locations have no formal bus stops and are entirely dependent on the passenger's requirements. The service numbers and the areas they operate within are as follows:

- Service no. 690 – Forres area;
- Service no. 691 – Speyside area; and
- Service no. 697 – Elgin Rural area.

3. Development of Route Options

3.1 An Overview of the Methodology

3.1.1. The methodology adopted for the identification and assessment of scheme route options was undertaken in accordance with the Design Manual for Roads and Bridges (DMRB). This started with the identification of study area constraints and followed a step by step procedure leading to confirmation of a shortlist of route options which are described and assessed in this report.

3.1.2. The process is set out diagrammatically on the flowchart in Figure 3.1 below.

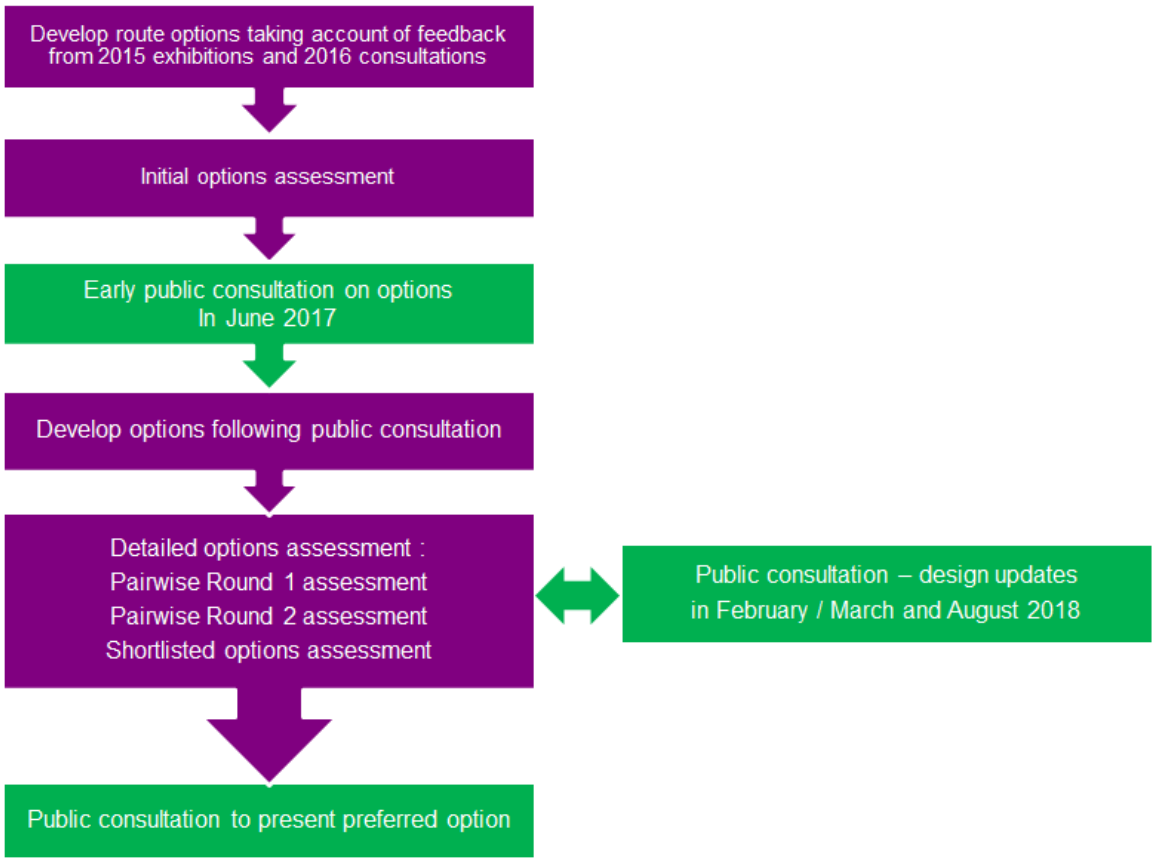

Figure 3.1: Process for Development of Route Options

3.1.3. Each of the steps is described in further detail below.

3.2 Initial Constraints and Corridor Identification

3.2.1. A desktop study was undertaken to obtain details of constraints information within the study area on the basis of improvement strategies Options B and N (see Chapter 1, Scheme Background, para 1.3.7). The initial constraints included:

- Topographical features;
- Designated sites including international, national and local designations;

- Existing properties including residential, agricultural and commercial;
- Listed buildings;
- Scheduled monuments;
- Protected landscapes; and
- Planning applications and designations.

3.2.2. The initial constraints across the study area are identified on Figure 3.2 (Volume 5).

3.2.3. Information was collated through liaison with statutory bodies including the Scottish Environment Protection Agency, Scottish Natural Heritage, Historic Environment Scotland and Moray Council. The information obtained from this process, together with other data and site visits, was used to identify corridors which were feasible for the development of route options. These corridors were generally 400m wide and sought to avoid the constraints where possible.

3.2.4. The feasible corridors are shown on Figure 3.3 (Volume 5). The colours adopted for the corridors were:

- Purple;
- Red;
- Orange;
- Green;
- Blue;
- Cyan;
- Yellow; and
- Black.

3.3 Initial Route Option Alignments

3.3.1. Once the corridors were finalised initial route option alignments were developed within each of the corridors. These options were designed to represent feasible alignments within these corridors.

3.3.2. The alignments were assumed to be 80m wide, which was considered as an appropriate width for a dual carriageway alignment with an allowance for earthworks and maintenance requirements.

3.3.3. Following the guidance set out in the A96 Dualling DMRB Stage 1 Assessment Report, May 2015, Appendix J – Junctions and Access Strategy, potential junction locations were identified for each of the route alignment options. This also facilitated traffic testing as part of the initial options assessment.

3.3.4. The alignments and potential junction locations are shown on Figure 3.4 (Volume 5). Also shown are a series of cross-overs from one colour to another:

- To the east of Forres, to connect Orange to Purple;
- To the east of Forres, to connect Red to Purple;
- To the west of Mosstodloch, to connect Red to Purple; and
- To the west of Mosstodloch, to connect Purple to Red.

3.4 Initial Options Assessment

3.4.1. An Initial Options Assessment was undertaken to measure the performance of each option against the scheme objectives in order to identify poorer performing options.

3.4.2. At this stage, there were three specific areas where the options were so similar that they could be considered as one for the purpose of the initial options assessment. These areas, as shown in boxes on Figure 3.4 (Volume 5), were:

- North of Forres, where the Orange Option split to provide alternative crossing points of the River Findhorn;
- South of Forres, where the Red Option split at Mundole; and
- South of Fochabers, where the Red Option split to provide alternative crossing points of the River Spey.

3.4.3. It was considered that, should these elements remain after the initial options assessment, the alternative route elements would be re-introduced for the more detailed assessment.

3.4.4. This approach resulted in a total of 43 options running between Hardmuir and Fochabers to be taken forward for initial options assessment.

3.4.5. Each route combination was assessed to determine its performance against the scheme objectives. The method by which the options were identified and their assessment, was presented to a multi-disciplinary options sifting workshop in April 2017. Details of the workshop are described in the Options Sifting Workshop - April 2017 - Final Report, which is included as Appendix A3.1 (Volume 4a).

3.4.6. The assessment, which was ratified at the workshop, arrived at the following key conclusions:

- Options containing the Yellow element performed poorly against the objectives;
- Options containing the Cyan element performed poorly against the objectives;
- Options containing the eastern end of the Blue element performed poorly against the objectives; and
- Options containing the Orange element at Fochabers performed poorly against the objectives.

3.4.7. Consequently, the workshop endorsed the following recommendations:

- The Yellow element should be de-selected;
- The Cyan element should be de-selected;
- The eastern end of the Blue element should be de-selected; and

- The Orange element at Fochabers should be de-selected.

3.4.8. The workshop also agreed that the remaining route options should be presented to the public and stakeholders.

3.5 Route Options Consultation – June 2017

3.5.1. The options were presented to the public and stakeholders as a series of individually named route elements. The naming convention related to the colour of the route combined with a unique numbered element reference. A total of 27 individual elements were identified:

- Purple elements P1 to P8;
- Orange elements O1 to O7;
- Red elements R1 to R9;
- Green elements G1 and G2; and
- Blue element B1.

3.5.2. It should be noted that the Black element from the initial options assessment was renamed P7 and P8.

3.5.3. Crossovers to the east of Forres and west of Mosstodloch and potential junction locations were also identified and exhibited to the public.

3.5.4. The route options presented to the public at the June 2017 public exhibitions are shown on Figure 3.5 (Volume 5).

3.5.5. The exhibitions were held between 12 noon and 7pm at the following locations on the dates shown below and attended by a total of over 1800 people.

- Elgin Town Hall 19 June 2017;
- Elgin Town Hall 20 June 2017;
- Fochabers, Bellie Church Hall 21 June 2017; and
- Forres Town Hall 22 June 2017.

3.5.6. The exhibitions were staffed by representatives of Transport Scotland and Mott MacDonald Sweco (MMS) who were available to answer any questions raised by attendees.

3.5.7. All of the information presented at the route options exhibitions is available on the Transport Scotland A96 Dualling Hardmuir to Fochabers project website.

3.5.8. Comments and feedback were welcomed from attendees and a total of over 750 responses were received. This was used to inform the ongoing development and assessment of the options. Responses were issued by Transport Scotland to all correspondence.

3.6 Detailed Options Assessment – Pairwise Round 1

3.6.1. As reported in Section 3.4 above, three route elements were set aside pending the results of the initial options assessment. Pairwise Round 1 examined these areas by comparative assessment to determine a preference.

3.6.2. The methodology adopted for these comparative assessments was based on the guidance set out in DMRB (Volume 5, Section 1, Advice Note TA 30/82 Choice between Options for Trunk Road Schemes).

3.6.3. These comparisons were entitled "Pairwise Assessments", which aimed to identify a preference between competing options over a part of the total route.

3.6.4. The first round of pairwise assessments examined the environmental, engineering, economic and traffic performance associated with three particular sections, namely:

- Pairwise A - south of Forres where elements R2 and R3 were compared;
- Pairwise B - north of Forres where elements O2 and O3 were compared; and
- Pairwise C - south of Fochabers where elements R8 and R9 were compared.

3.6.5. The locations of these pairwise sections are shown on Figure 3.6 (Volume 5).

3.6.6. The pairwise assessments were undertaken to identify a preference between the competing options under the following headings:

- Environment:
  - communities and people; and
  - natural and cultural heritage;
- Engineering; and
- Traffic/economics.

3.6.7. Each of the comparisons permitted an option to be ranked under the heading as having:

- No preference;
- Slight preference; or
- Clear preference.

3.6.8. This resulted in the identification of an overall preference for one of the competing pairwise options.

3.6.9. The assessment was presented to a multi-disciplinary workshop in January 2018 as set out in the Detailed Options Assessment - Pairwise Round 1 Workshop Report, which is included as Appendix A3.2 (Volume 4a) to this report.

3.6.10. The results of Pairwise Round 1 were as follows:

- Pairwise A – Element R3 was preferred;
- Pairwise B – Element O3 was preferred; and

- Pairwise C – Element R8 was preferred.

3.6.11. Consequently, elements R2, O2 and R9 were deselected.

3.7 Route Option Development

3.7.1. Following the public consultation exhibitions of June 2017, the options were developed taking into account the following factors:

- Feedback from consultations (public, statutory bodies, landowners, etc);
- Three-dimensional geometric design of mainline, junctions and side roads;
- Consideration of non-motorised users (NMUs);
- Preliminary earthworks and drainage design;
- Outputs from flood models to identify suitable structural forms for major river crossings;
- Optimisation of junction locations utilising traffic model information; and
- Interaction with environmental / landscape specialists in optimising alignments and junction layouts.

3.7.2. This design development resulted in the route alignments being amended in a number of locations:

- P1 at Hardmuir;
- P1 at Wester Moy;
- B1 at Burgie;
- O5 at Ordies / Earnside;
- P3 at Hardhillock;
- O5 at Kintrae;
- P3 junction and link road south-west of Elgin; and
- P4 and R6 junctions south-east of Elgin.

3.7.3. These locations and key reasons for these design amendments are illustrated in Figure 3.7 (Volume 5).

3.8 Route Options Design Update - February and March 2018

3.8.1. Public Drop-In sessions were held late February and early March 2018 to provide the following key information:

- The results of Pairwise Round 1 which confirmed that elements R2, O2 and R9 were set aside from further consideration; and
- Confirmation of the changes to the route elements as reported in section 3.7 above.

3.8.2. The route options presented to the public at the February and March 2018 Drop-In sessions are shown on Figure 3.7 (Volume 5).

3.8.3. In addition, more detailed plans of all of the options were displayed to provide further information to the public on scheme progress.

3.8.4. The Drop-In events were held between 12 noon and 7pm at the following locations on the dates shown below and attended by a total of over 1300 people.

- Elgin Town Hall 27 February 2018;
- Elgin, Mansfield Hotel 28 February 2018;
- Forres Town Hall 01 March 2018; and
- Fochabers Institute 02 March 2018.

3.8.5. The Drop-In events were staffed by representatives of Transport Scotland and MMS who were available to answer any questions raised by attendees.

3.8.6. All of the information presented at the Drop-In events is available on the Transport Scotland A96 Dualling Hardmuir to Fochabers project website.

3.8.7. Comments and feedback were welcomed from attendees and a total of over 250 responses were received. This was used to inform the ongoing development and assessment of the options. Responses were issued by Transport Scotland to all correspondence.

3.9 Detailed Options Assessment – Pairwise Round 2

3.9.1. A further round of pairwise assessments was undertaken to examine the environmental, engineering, economic and traffic performance associated with five particular sections, namely:

- Pairwise D involving Purple element P1 being compared with Red / Orange elements R1-O1-O3-O4;
- Pairwise E involving Red / Purple elements R5, P2 being compared with the Blue element B1;
- Pairwise F involving Orange element O5 being compared with Purple / Green elements P2-G1;
- Pairwise G involving Orange element O7 being compared with Green / Purple elements G2-P5-P6; and
- Pairwise H involving Purple elements P4-P5 being compared with Red elements R6-R7.

3.9.2. The locations of these pairwise sections are identified on Figure 3.8 (Volume 5).

3.9.3. It should be noted that, prior to the commencement of Pairwise Round 2 the location of the Elgin East junction on elements P4 and P5 was moved approximately 1.5km to the east, providing a more direct connection to the existing A96 south of Lhanbryde.

3.9.4. As was the case for Pairwise Round 1, the pairwise assessments were undertaken to identify a preference between the competing options under the following headings:

- Environment:

  - communities and people; and
  - natural and cultural heritage;
- Engineering; and
- Traffic/economic.

3.9.5. Each of the comparisons permitted an option to be ranked under the heading as having:

- No preference;
- Slight preference; or
- Clear preference.

3.9.6. This resulted in the identification of an overall preference for one of the competing pairwise options.

3.9.7. The assessment was presented to a multi-disciplinary workshop in April 2018 as detailed in the Detailed Options Assessment - Pairwise Round 2 Workshop Report, which is included as Appendix A3.3 (Volume 4a) to this report.

3.9.8. The workshop concluded that the following route elements should be taken forward to the next stage of scheme assessment.

- Pairwise D – Red / Orange elements R1-O1-O3-O4;
- Pairwise E - Red / Purple elements R5-P2;
- Pairwise F – Purple / Green elements P2-G1;
- Pairwise G – Green / Purple elements G2-P5-P6; and
- Pairwise H - Purple elements P4-P5.

3.9.9. The following route elements were therefore removed from further consideration:

- Purple element P1;
- Blue element B1;
- Orange element O5;
- Orange element O7; and
- Red elements R6-R7.

3.10 Further Design Development

3.10.1. The remaining options were examined and developed further using feedback from the Pairwise Round 2 workshop, ongoing consultation and additional information obtained from site surveys and further site visits.

3.10.2. This resulted in further changes at four locations as shown on Figure 3.9 (Volume 5). These locations were:

- Red element (R4) south of Forres at Mannachie Road;
- Orange element (O4) at Forres East junction;

- Green element (G2) at Coxton Tower; and
- Purple element (P7) at Balnacoul Wood.

3.10.3. The key reasons for these design amendments, including the Purple alignment (P4) Elgin East junction and link road reported in section 3.9.3 above, are also shown on Figure 3.9 (Volume 5).

3.11 Route Option Design Update – August 2018

3.11.1. A design update publication was issued to interested parties in August 2018, to inform the public of the ongoing development work.

3.11.2. The route options presented in the Design Update in August 2018 are shown on Figure 3.9 (Volume 5).

3.11.3. The design update covered the following key issues:

- Results of the Pairwise Round 2 assessments; and
- Details of design amendments undertaken since the February and March 2018 Drop-In events.

3.11.4. All of the information presented in the Route Option Design Update is available on the Transport Scotland A96 Dualling Hardmuir to Fochabers project website.

3.11.5. Comments and feedback were welcomed and a total of over 250 responses were received. This was used to inform the ongoing development and assessment of the options. Responses were issued by Transport Scotland to all correspondence.

3.12 Shortlisted Options

3.12.1. Following the conclusion of Pairwise Round 2, the shortlisted options which remain for detailed options assessment are shown diagrammatically on Figure 3.10 below.

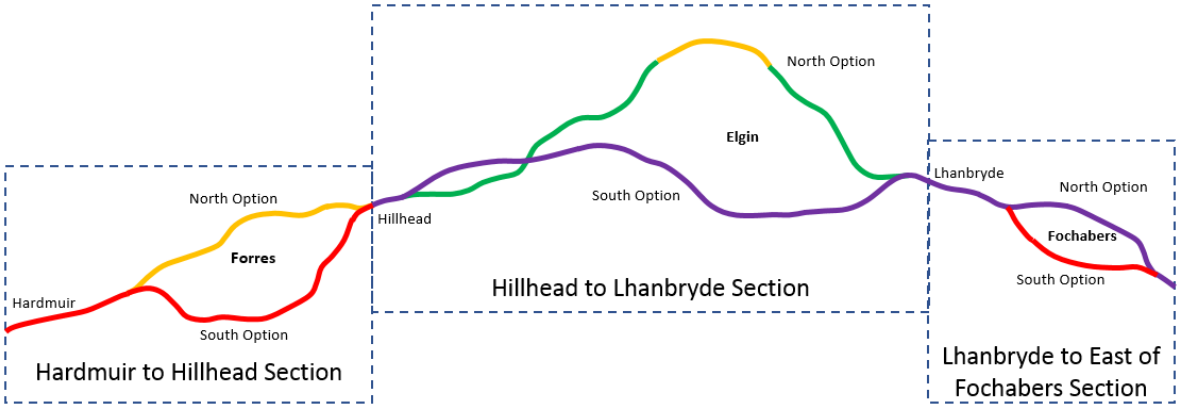

Figure 3.10: Shortlisted Options

3.12.2. As a result, the choice of Preferred Option for the full length of the scheme can be determined from the combination of favoured options resulting from assessment of the following three separate sections:

- Hardmuir to Hillhead;
- Hillhead to Lhanbryde; and
- Lhanbryde to East of Fochabers.

3.12.3. Therefore, the six shortlisted options which are assessed and reported in the remaining sections of this report are as follows: -

- Hardmuir to Hillhead – North Option;
- Hardmuir to Hillhead – South Option;
- Hillhead to Lhanbryde – North Option;
- Hillhead to Lhanbryde – South Option;
- Lhanbryde to East of Fochabers – North Option; and
- Lhanbryde to East of Fochabers – South Option.

3.12.4. Refer to Figure 3.11 (Volume 5).

3.13 Description of the "Do Minimum" Scenario

3.13.1. The "Do Minimum" Scenario to be used on this scheme assessment includes the interventions listed in Table 3.1 below:

Table 3.1: Do Minimum Interventions

Road Scheme	Year of Inclusion
Queensferry Crossing (Forth Replacement Crossing)	2017
M8 / M73 / M74 Motorway Improvements	2017
Aberdeen Western Peripheral Route (AWPR) / Balmedie to Tipperty	2017
A96 Inveramsay Bridge	2017
A68 Pathhead to Tynehead Junction	2017
A702 Candymill Bend and Edmonstone Brae	2017
A95 Lackghie	2017
A75 Dunragit Bypass Scheme	2017
A75 Hardgrove to Kinmount Scheme	2017
A82 Crianlarich Bypass	2017
A82 Pulpit Rock Scheme	2017
Glasgow East End Regeneration Route Phase 3 (Clyde Gateway Route)	2017
Portstown Link Road	2017

Road Scheme	Year of Inclusion
Third Don Crossing	2017
Soutra South to Oxton	2017
Dundee Waterfront	2017
Dyce Drive Link Road (part of Dyce Park and Ride)	2017
Speed limit changes on A96 at Pitmachie	2022
A90/A96 Haudagain Roundabout Improvement	2022
Inverness West Link	2022
M8 J29a Bishopton Junction	2022
M9 Winchburgh Junction	2027

3.14 Cost Estimates for Shortlisted Options

3.14.1. Scheme cost estimates have been prepared for each shortlisted option under consideration.

Works Costs

3.14.2. The quantifiable items of the works have been measured and a cost per unit has been applied based on rates from similar Transport Scotland schemes.

3.14.3. Works elements that are difficult to quantify at this stage have been assessed as a percentage of the total works costs, again based on similar Transport Scotland schemes. The percentage allowances are as shown in Table 3.2 below:

Table 3.2: Percentage Allowances

Works elements	Percentage of the total Works Costs
Preliminaries	15%
Kerbs & Footways, Traffic Signs & Road Markings, and Street Lighting have been amalgamated under the heading “Other roadworks costs”.	4%
Accommodation Works	3%
Landscaping	2%

Preparation Costs

Statutory Undertakers

3.14.4. Potential utility conflicts have been identified and a cost estimate for diversion/protection has been applied to each.

Land and Property Costs

3.14.5. The District Valuer has provided appropriate rates to apply to various land classifications in order to derive an initial estimate of land acquisition cost for each route option.

3.14.6. An allowance for compensation has been applied; this has been derived on a pro-rata basis from similar Transport Scotland schemes.

Detrunking Costs

3.14.7. An allowance for detrunking of the existing A96 that remains after completion of the new works has been included. A pro-rata rate was derived from similar provisions included within other similar Transport Scotland schemes and applied to the length of existing A96 to be replaced by the new A96 dual carriageway.

Preparation and Administration Costs

3.14.8. A percentage allowance of 9% has been included for the item "Preparation and Administration Costs" and is applied to the sum of works costs, utilities costs, land and property costs, and detrunking costs. This has been derived from DMRB (Volume 15, Section 1, Part 6 The NESA Manual).

3.14.9. A percentage allowance of 5% has been included for the item "On-site Supervision and Testing" and is applied to the sum of works costs, utilities costs, land and property costs, and detrunking costs. This has also been derived from the NESA Manual.

Risk and Optimism Bias

3.14.10. The risks to the Scheme have been identified in a risk register. For the significant financial risks, a probability of occurring and a cost impact have been quantified. While most risks are threats of increased costs, some are opportunities for reduced costs. A simulation based on the Monte Carlo simulation method (using @Risk) was carried out for each shortlisted option to generate a quantified risk assessment allowance which has been included within each of the cost estimates.

3.14.11. As required by both the Scottish Transport Appraisal Guidance (STAG) Technical Database and the NESA Manual an allowance for Optimism Bias (OB) is included within the scheme cost estimate. Due to the inclusion of a quantified risk allowance, the OB allowance is 25%. This is applied to the sum of the Works Cost Total, the Preparation Cost Total and the Quantified Risk Assessment Allowance.

Cost Estimate Summary

3.14.12. The scheme cost estimate for each shortlisted option is provided in Table 3.3 below at Quarter 1 2018 prices.

Table 3.3: Shortlisted Options Cost Estimate Summary

Option	Cost Estimate Q1 2018 (excluding VAT)
Hardmuir to Hillhead – North Option	£279.6m
Hardmuir to Hillhead – South Option	£263.8m
Hillhead to Lhanbryde – North Option	£354.3m
Hillhead to Lhanbryde – South Option	£329.6m
Lhanbryde to East of Fochabers – North Option	£212.3m
Lhanbryde to East of Fochabers – South Option	£250.5m

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