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A96
DUALLING
EAST OF HUNTLY TO ABERDEEN

A96 Dualling

East of Huntly to Aberdeen scheme

DMRB Stage 2 Scheme Assessment Report

Volume 1 - Part 1

The Scheme (East of Huntly to Kintore)

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A96 Dualling East of Huntly to Aberdeen

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

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Glossary of Terms

'A' weighting dB(A)	The human ear does not respond uniformly to different frequencies. A-weighting is commonly used to simulate the frequency response of the ear.
1d-2d hydraulic modelling	Dynamically linked one-dimensional computational modelling of a watercourse and two-dimensional computational modelling of the connected floodplain(s).
Above Ordnance Datum (AOD)	The mean sea level at Newlyn (UK) used as a base measurement on Ordnance Survey Maps for contours.
Abstraction	The process of taking or extracting water from a natural source (rivers, lakes, groundwater aquifers etc).
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 landowners and to reduce the impact of the road scheme.
Affected Road Network	Affected roads are those that meet any of the following criteria: road alignment will change by 5 m or more; or daily traffic flows will change by 1,000 AADT or more; or Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or daily average speed will change by 10 km/hr or more; or peak hour speed will change by 20 km/hr or more.
Allocation	A proposal for land for housing, industry or other uses within a Local Development Plan that identifies a specific area of land to be developed within the time period of the plan.
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 Value	Defined as the relative pleasantness of a journey and relates in particular to the exposure of pedestrians and others to traffic.
Amphibolite	Medium-grained dark coloured rock formed by regional metamorphism composed predominantly of amphibole minerals (most commonly hornblende) and plagioclase. Formed from metamorphism of basic igneous rocks.
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 (AADT)	Annual average daily traffic is the total volume in both directions of vehicle traffic of a road for a year divided by 365 days.

Aplite (adjective: Aplitic)	Fine-grained light coloured felsic/silicic igneous rock composed predominantly of quartz and alkali feldspar. Commonly found as veins associated with late-stage granite bodies.
Appropriate Assessment	An assessment of likely impacts associated with a development on a European Protected Site. An Appropriate Assessment is required by law under Regulation 48 of the Habitats Regulations (1994), implementing Article 6(3) of the Habitats Directive (92/43/EEC).
Aquifer	A body of rock through which appreciable amounts of water can flow.
Arable Land	Land used for growing crops such as wheat and barley.
Argillaceous	Descriptive term for rocks formed from clay and / or silt sediments.
Artificial Ground	Areas where the ground surface has been significantly modified by human activity, including worked ground, made ground and infilled ground.
Aspirational Core Paths	Paths identified by Aberdeenshire Council, however have no statutory designation.
Assessment	An umbrella term for description, analysis and evaluation.
At-grade Junction	A junction arrangement at which two or more roads meet at the same level.
Attenuation	Increase in duration of flow hydrograph with a consequent reduction in peak flow.
Baseline	The existing conditions which form the basis or start point of the environmental assessment.
Basic Rock	Class of igneous rock with 45-53% silica by volume, and relatively high concentration of iron, magnesium and calcium. Examples include gabbro and basalt.
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	Hard rock that lies beneath a superficial cover of soils and sediments.
Benefit to Cost Ratio (BCR)	An indicator, used in the formal discipline of cost-benefit analysis that attempts to summarise 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	Biological diversity, or richness of living organisms present in representative communities and populations.
Biotite	Dark coloured rock-forming mineral (mica group).

Bund	An embankment, wall or dam that can be used to reduce noise, provide potential visual mitigation or alternatively built around an oil tank to contain the contents in the event of spillage.
Burial Cairn	A man-made pile (or stack) of stones that has been erected over a burial site.
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.
Caledonian (age)	Refers to rocks formed during the Caledonian Orogeny, a major mountain-building event 490-390 million years ago.
Carboniferous	Period of geological time 362.5-290 million years ago, during which Scotland experienced a tropical climate and significant volcanism.
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.
Clearance Cairn	An irregular and unstructured collection of field stones which have been removed from arable land or pasture, to allow for more effective agriculture, and which have been collected into a usually low mound or cairn.
Climate	The weather conditions prevailing in an area in general or over a long period.
Climate Change Resilience and Adaptation Assessment	An assessment of the vulnerability of the scheme to climate change.
Climate Change Risk Assessment	A five-yearly assessment of climate change risk undertaken at a national level on different sectors of society.
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.
Community Severance	Community severance is the separation of residents from facilities and services they use within their community as a result of new or improved roads or by changes in traffic flows.
Conglomerate	Coarse-grained rock with rounded clasts that are greater than 2mm in size.
Coniferous Woodland	An area of woodland with predominantly coniferous tree species (less than 10% deciduous trees in the canopy).
Conservation	Preservation or restoration of the natural environment and wildlife.

Conservation Area	Area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. Designated under section 61 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
Constructability	An assessment of the complexity of constructing the scheme undertaken during the preparation stages to identify the key challenges involved.
Contact Metamorphism	Recrystallisation of rocks surrounding an igneous intrusion in response to heat from the intrusion.
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 Public Right of Way (PRoW), footways, cycleways, tracks, waterways or any other means a person may cross land.
Corridor Road Assignment Model (CRAM)	The A96 Corridor Road Assignment Model (CRAM) is Transport Scotland's corridor long Simulation and Assignment of Traffic in Urban Road Networks (SATURN) highway model covering the A96 between the Raigmore Interchange in Inverness and Haudagain Roundabout in Aberdeen.
Cropmark	Pattern that appears in growing crops as a result of differential growth and ripening patterns. Some are the result of natural variations in the subsoil, but many are caused by traces of archaeological features below the plough soil. Cropmark patterns are usually only visible from the air.
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, hard shoulders, 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 closed conduit carrying a watercourse beneath an obstruction such as a road, railway or canal. 'Closed' implies that a culvert has a hard soffit and invert. 'Conduit' implies the conveyance of water some or all of the time, but excluding tunnels and underpasses for vehicles, pedestrians and animals.
Cumulate Intrusion	A layered igneous intrusion formed by fractional crystallization of magma.

Cumulative Effects	The additive or synergistic effects of the proposed development in conjunction with other developments.
Cutting	Typically where part of a hill or mountain is cut out to make way for a road or railway line.
Dalradian	Supergroup of metasedimentary and igneous rocks found in Scotland and Ireland, originally deposited 800-510 million years ago.
Decibel (dB)	The range of audible sound pressures is approximately 0.00002 Pa to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB. Mathematically: Sound pressure level (dB) = 20 Log (p _i /p ₀) Where p ₀ = 2 x 10 ⁻⁵ Pa
Departure from Standard	Any variation or waiving of a requirement contained within a DMRB document.
Design Manual for Roads and Bridges (DMRB)	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.
De-trunking	After the proposed dual carriageway opens, the sections of the existing A96 will no longer be a trunk road.
Digital Terrain Model (DTM)	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	The Do-Minimum plus the proposed scenario involving construction of a dual carriageway from east of Huntly to Kintore.
Do-Something Economic Scenario	A fixed demand assessment.
Do-Something Environmental/ Operational Scenario	An assessment with induced trips associated with the full A96 dualling between Inverness and Aberdeen.
Dovecot	A shelter with nest holes for domesticated pigeons.
Drift Deposits	Drift geology overlying bedrock.
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.

Ecological Impact Assessment	Ecological Impact Assessment is the evaluation and assessment of a proposed development in relation to the potential impacts it may have upon ecological features.
Effect	The result of change or changes on specific environmental resources or receptors.
Element	A component part of the landscape or environment (e.g. roads, hedges, woodlands).
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).
Emission Factor	Calculated vehicle pollutant emission rates for NO _x , PM ₁₀ , PM _{2.5} and CO ₂ for a specified year, road type, vehicle speed and vehicle fleet composition.
Engineering Fill	Soil which has been selected, placed and compacted to an appropriate specification with the object of achieving a particular engineering performance.
Environmental Impact Assessment (EIA)	The process by which information about the environmental effects of a project is evaluated and mitigation measures are identified.
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).
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.
Fault (Geological Fault)	Fracture or planar structure in a body of rock caused by brittle failure, along which a relative displacement can be observed between blocks.
Feldspar (adjective: Feldspathic)	Group of rock-forming silicate minerals.
Feldspathic Psammite	A metamorphosed sandstone, rich in the mineral feldspar.
Fill	Material deposited by man in ground depression or excavated area or to construct an embankment.
Fissile/Fissility	Term describing the ability of rock materials to split, typically into planar or tabular fragments. Term is generally applied to slates, mudstones, schists and other pelitic rocks.
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 (FEH)	Provides the industry-standard methods for assessing flood risk hydrology in the UK.
Floodplain	Land adjacent to a river, which is subject to regular flooding.
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 landforms associated with river channels and the sediment processes which form them.
Foliation	Orientation of platy or tabular minerals within rock into planes. Occurs in regionally metamorphosed rocks such as slate.
Footprint	The geographical extent of the Scheme.
Fragmentation	Breaking up of an organism's habitat into smaller fragments that may vary in size.
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.
Frequency	Frequency is the rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the hertz (Hz), which is identical to cycles per second. A 1000Hz is often denoted as 1kHz, e.g. 2kHz = 2000Hz. Human hearing ranges approximately from 20Hz to 20kHz. For design purposes the octave bands between 63Hz to 8kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or narrow frequency bands.
Gabbro	Coarse-grained dark coloured basic / mafic intrusive igneous rock, formed from slow crystallization of basic / mafic magmas. Key minerals include plagioclase feldspar and pyroxenes (orthopyroxene and clinopyroxene).
Gabbronorite	Coarse-grained dark coloured basic / mafic intrusive igneous rock, formed from slow crystallization of basic / mafic magmas. Composition between that of gabbro and norite.
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.

GeoIndex	Online map-based index of geological and hydrogeological information, produced by the British Geological Survey (BGS).
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.
Geomorphology	The branch of geology concerned with the structure, origin and development of topographical features of the earth's crust.
Geophysical Survey	Geophysical survey is a non-intrusive pre-construction archaeological evaluation technique that exploits a variety of physical or chemical characteristics of rocks and soils etc, in an attempt to locate underground features of archaeological interest. Types of geophysical survey include magnetometer survey, magnetic susceptibility survey and resistivity survey.
Glacial Till	Glacial till is 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.
Glaciolacustrine Deposits	Deposits formed in the bottom of a glacial lake.
Gneiss	Coarse-grained rocks formed during high-grade regional metamorphism, with distinctive banded appearance resulting from separation of dark and light coloured minerals. Dark bands may include biotite, hornblende and pyroxenes, and light bands comprise quartz and / or feldspars. Term Gneissose is also used to describe rock texture.
Grade Separated Junction	A junction arrangement that is separated by level from the through carriageway.
Granite (adjective: granitic)	Coarse-grained light coloured felsic/silicic intrusive igneous rock, formed from slow crystallization of felsic/silicic magmas. Key minerals include quartz and feldspars (biotite and muscovite micas also usually present).
Granular	Containing gravel, sand, or silt (coarse grained soil).
Ground Investigation	Exploratory investigation to determine the structure and characteristics of the ground influenced by a development. The collected information is used to establish or predict ground and groundwater behaviour during, and subsequent to, construction.
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Groundwater Dependent Terrestrial Ecosystem	Wetlands and their habitats which critically depend on groundwater flows and / or chemistries.

Groundwater Flooding	Groundwater flooding occurs when the water table in permeable rocks rises to cause flooding above the ground surface.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities, as used, for example in a Phase 1 Habitat Survey.
Habitats Regulations Appraisal	Habitats Regulations Assessment (HRA) is the process that competent authorities must undertake to consider whether a proposed development plan or programme is likely to have likely significant effects on an internationally important site designated for its nature conservation interest.
Harzburgite	Dark coloured ultramafic / ultrabasic intrusive igneous rock found within cumulate intrusions. Consists mostly of the minerals olivine and pyroxene.
Headroom	The minimum distance between the surface of the carriageway and a structure.
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Hectare	1 hectare = 2.471 acres (10,000 square metres).
Henge	A prehistoric monument consisting of a circle of stone or wooden uprights.
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. This is aimed at assisting the haulage industry and ensuring routes are maintained to agreed capacities. The high load routes are either 18' or 20'.
Hillfort	A defended place or settlement, surrounded by one or more circuits of banks and ditches, and generally placed on hilltops, ridges, spurs or promontories.
Historic Environment Record	A record of local archaeological sites, monuments and records which is held by Aberdeenshire Council Archaeology Service (ACAS) on behalf of Aberdeenshire Council.
Hornfelsed / Hornfelsing	Recrystallization of rock due to heat from an igneous intrusion (see Contact Metamorphism). The process of Hornfelsing can cause rocks to be hardened or 'baked' and to develop a spotted appearance.
Hut Circle	A circular or oval depression in the ground with evidence of a low stone wall around it that used to the foundation of a roundhouse.
Hydrogeology	The branch of geology that deals with the occurrence, distribution, and effect of ground water.
Hydrological	The exchange of water between the atmosphere, the land and the oceans.

Igneous Rock	One of the three main groups of rock types; rocks that have crystallization from magma.
Impact	Any changes attributable to the proposed scheme that have the potential to have environmental effects (i.e. the causes of the effects).
Impermeable	Material that does not allow fluids to pass through it.
Infilled Ground	Areas where the ground has been cut away then wholly or partially backfilled.
Infrastructure Investment Plan (IIP)	A Scottish Government document that sets out priorities for investment and long-term strategy for the development of public infrastructure in Scotland.
Intergranular Flow	Groundwater flow in openings and void space between grains or weathered rock.
Intrusion (Intrusive Rock)	Term applied to a body of igneous rock that is emplaced within pre-existing rock.
Inventory Gardens and Designed Landscapes	Designated garden and designed landscape listed in 'An Inventory of Gardens and Designed Landscapes in Scotland or its Supplements' (Inventory published by Historic Environment Scotland).
Inventory Historic Battlefields	Designated historic battlefield listed in 'An Inventory of Historic Battlefields' (Inventory published by Historic Environment Scotland).
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.
$L_{A10, 18h}$	For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{10} , the level exceeded for 10% of the time period under consideration can be used for the assessment of road traffic noise. A weighted statistical noise levels are denoted dB_{LA10} . The reference time period (T) is normally included, e.g. $dB_{LA10, 18h}$ indicating an 18 hour time period.
L_{Aeq}	Equivalent Continuous Sound Level. A notional steady sound level which would cause the same A-weighted sound energy to be received as that due to the actual, possibly fluctuating, sound level over a given period of time.

L _{Amax,F}	<p>The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125ms duration and fast time weighting (F) has an exponential time constant of 125ms which reflects the ear's response. Slow time weighting (S) has an exponential time constant of 1s and is used to allow more accurate estimation of the average sound level on a visual display.</p> <p>The maximum level measured with fast time weighting is denoted as L_{Amax, F}. The maximum level measured with slow time weighting is denoted L_{Amax, S}.</p>
Lacustrine Deposits	Deposits formed in the bottom of a lake.
Lamination (Laminated)	Very fine stratification (layering) of rock or soil layers less than 20mm thick.
Land Capability for Agriculture (LCfA)	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 Take	Land that will need to be acquired for the scheme which is estimated at this stage for comparative purposes only. The land required for the scheme will be identified at DMRB Stage 3.
Landmark Information Group	Organisation supplying historical mapping and environmental sensitivity data.
Landscape	Human perception of the land, conditioned by knowledge and identity with a place.
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 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 Characteristics	Elements, or combinations of elements, which make a contribution to distinctive landscape character.
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 Unit	A constituent part of the landscape that has distinctive features. Local landscape character areas may contain one or more landscape units.

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	Light Detection and Ranging. 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.
Likely Significant Effect	A predicted significant effect upon an ecological feature of an internationally important designated site, as determined by the Habitats Regulations Appraisal (HRA) process.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Lnight	The Lnight descriptor is used to represent the noise level at residential receptors between the hours of 23:00 and 07:00.
Local Development Plan	As defined in Part 3 Section 5 of The Planning etc. (Scotland) Act 2006.
Local Landscape Character Area (LLCA)	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 Nature Conservation Site	A non-statutory designated site for nature conservation, as detailed by a local authority.
Local Road	An A, B or C classified road (non-Trunk Road) or unclassified road typically operated by a local authority or council.
Long Established Woodland 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.
Loop	A connecting road, utilising a continuous curve in the connection of two roads within a junction.
Made Ground	Material deposited by man i.e. not natural.
Mafic	General descriptive term for dark coloured igneous rocks with abundant pyroxene, amphiboles or biotite.
Magnitude	Size, extent, scale and duration of an impact.
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.
Maintenance Strip	Land to enable access for maintenance of earthwork slopes, fencing etc.
Major Development	As defined in Part 3 Section 5 of The Planning etc.(Scotland) Act 2006.
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).
Memoir (Geological Memoir)	Books or guides issued to accompany individual geological maps published by the British Geological Survey.
Merge	A link road accessing the main carriageway from a subsidiary road or junction.
Metaconglomerate	A metamorphic rock in which the protolith (original unmetamorphosed rock) was a conglomerate.
Metamorphic Rock (process: metamorphism)	One of the three main groups of rock types; rocks that have formed by the recrystallisation or alteration of pre-existing rock in response to a change in pressure or temperature.
Micaceous Psammite	A metamorphosed sandstone, rich in mica (clay) minerals.
Microgabbro	Medium-grained dark coloured basic / mafic intrusive igneous rock, formed from crystallization of basic / mafic magmas. Microgabbros cool at a faster rate than plutonic gabbros, and are commonly found in shallow level intrusions such as sills, dykes and plugs. Key minerals include plagioclase feldspar and pyroxenes. Microgabbro is also known by the names 'dolerite' and 'diabase'.
Microgranite	Medium-grained light coloured felsic/silicic intrusive igneous rock, formed from crystallization of felsic/silicic magmas. Key minerals include quartz and feldspars (biotite and muscovite micas also usually present).
Migmatite (adjective: migmatitic)	Coarse-grained variable mixed rock containing a combination of high-grade metamorphic material with a gneissose texture, and igneous material with the mineralogy of granite produced from partial melting during extreme metamorphism.
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	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
Moat	A deep, wide ditch surrounding a castle, fort or town, typically filled with water and intended as a defence against attack.

Monzodiorite	Medium to coarse-grained intermediate intrusive igneous rock with high feldspar content (plagioclase dominant over orthoclase).
Monzonite	Medium to coarse-grained intermediate intrusive igneous rock with high feldspar content (plagioclase and orthoclase in roughly equal proportions).
Mort house	Solidly built windowless vaults, with massive walls and heavy wooden and metal doors, that housed corpses until they started to decompose, so their graves would not be desecrated by body-snatchers digging them up to sell the cadavers to medical colleges for dissection.
Motte and bailey	Fortification with a wooden or stone keep situated on a raised earthwork called a motte, accompanied by an enclosed courtyard, or bailey, surrounded by a protective ditch and palisade.
Muscovite	Typically silvery-white coloured rock-forming mineral (mica group).
National Cycle Network	A network of cycle routes across the UK which is managed by Sustrans. The routes utilise a combination of minor roads, pedestrian routes, disused railways and traffic calmed routes.
National Nature Reserve	Areas of national importance. National Nature Reserves (NNRs) are areas of land or water designated under the Wildlife and Countryside Act 1981 as containing habitats and species of national importance.
National Record of the Historic Environment	The national cultural heritage database as maintained by Historic Environment Scotland.
National Vegetation Classification	National Vegetation Classification (NVC) survey is a method of classifying habitats by species and environmental conditions into unique classes.
Native	A species occurring naturally, in its normal geographic range.
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.
Natural Capital Assessment	The process of valuing impacts and dependencies upon natural capital in order to better integrate natural capital into decision-making.
Nearly Native Woodland	Woodland area where native species make up between 40% and 50% of the canopy. These are woods that could have potential to be converted into native woodlands by altering their species mix.
Nestrans	Transport Partnership for Aberdeen City Council and Aberdeenshire Council.

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-Inventory Designed Landscapes	Non-designated parks, gardens and designed landscapes which do not qualify for inclusion in the Inventory of Gardens and Designed Landscapes in Scotland but which are of regional / local interest.
Non-Motorised User (NMU)	Pedestrians, cyclists, equestrians, non-motorised scooter users, wheelchair and powered wheelchair users. In addition, includes those with impaired mobility and increased vulnerability within these groups.
Norite	Coarse-grained dark coloured basic / mafic intrusive igneous rock, formed from slow crystallization of basic / mafic magmas. Key minerals include plagioclase feldspar and pyroxenes (orthopyroxene dominant over clinopyroxene).
Olivine	Typically greenish coloured rock forming mineral. Most abundant in ultramafic and mafic igneous rocks.
Opening Year	Planned opening year of scheme.
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 Section 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.
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.
Palisaded Enclosure	An enclosure surrounded by one or more rows of closely spaced vertical timbers embedded in a narrow foundation trench.
Pastoral Land	Land used for keeping animals such as cows and sheep.
Peat	Dark coloured organic soil formed from partial decomposition of vegetation in wet acidic conditions such as in bogs and marshes.
Pegmatite (adjective: Pegmatitic)	Very coarse-grained igneous rock, typically of granitic composition. Formed from very slow late stage crystallization of magma.
Pelite (adjective: Pelitic)	Rock formed from metamorphism of clay-rich sedimentary rocks such as mudstone.
Penannular	In the form of a ring but with a small part of the circumference missing.

Perception / Perceived	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Peridotite	Coarse-grained ultrabasic / ultramafic intrusive igneous rock formed from slow crystallization of ultrabasic / ultramafic magmas. Key minerals are olivine and ferromagnesian minerals such as orthopyroxene and clinopyroxene.
Permeability	Ability of a porous material (such as rock or soil) to allow fluids to pass through it.
Phase 1 Habitat Survey	A rapid method of mapping and recording habitats, this can include botanical species and target notes to show notable features.
Phyllite	Fine-grained foliated rock formed by regional metamorphism of clay-rich sedimentary rocks.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Plantations on Ancient Woodland Sites	Plantations of Ancient Woodland Sites (PAWS) are ancient semi-natural woodlands in which the original, 'natural' woodland has been fully or partially cleared, and replaced by a plantation of either native or non-native species.
Pluton	A body of intrusive igneous rock.
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.
Precautionary Principle	The precautionary principle enables decision-makers to adopt precautionary measures when scientific evidence about an environmental or human health hazard is uncertain.
Preferred Option	The end-to-end option provided as the scheme recommendation for advancement at the end of the DMRB Stage 2 assessment.
Prime Agricultural Land	Land capable of supporting arable agriculture which falls within Land Capability for Agriculture (LCfA) 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).
Psammite	Formed from metamorphism of quartz-rich rocks such as sandstone or arkose.
Public Rights of Way (PROW)	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.
Quartz	Rock-forming silicate mineral. Abundant in felsic / silicic igneous rocks.
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.
Ramsar Sites	Internationally important wetland identified for conservation under the Ramsar convention (1971).
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.
Recumbent Stone Circle	Type of stone circle that incorporates a large monolith, known as a recumbent, lying on its side in the south-western or southern arc of the ring, and flanked by the two tallest stones of the circle.
Regionally Significant HER Sites	Non-designated heritage assets with a 'Regionally Significant' classification in the local Authority's Historic Environment Record (HER).
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.
Residual Effect	Residual impacts are defined as those impacts that remain following the implementation of the mitigation measures proposed.
Ring Cairn	Circular or slightly oval, ring-shaped, low (maximum 0.5m high) embankment, several metres wide and from 8m to 20m in diameter.

Ring Ditch	A trench of circular or penannular plan cut into bedrock which when excavated is usually found to be the ploughed out remains of a round barrow. They are usually identified through aerial photography either as soil or cropmarks.
Riparian Zone	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
River Terrace Deposits	Deposits formed from deposition of sediment on floodplains or as raised terraces adjacent to fluvial channels during flood events.
Runoff	Water that flows over the ground surface. This occurs if the ground is impermeable or if permeable ground is saturated.
Rural	In, relating to, or characteristic of the countryside rather than the town.
Salmonid	Belonging to the salmon family.
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	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Schist	Rock formed from low to medium grade regional metamorphism of pelitic rock. Rocks display distinct schistosity (planar alignment of platy minerals).
ScotTAG	Online guidance documents for transport appraisals in Scotland – Transport Scotland January 2018.
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 (SEPA)	Scotland's principal environmental regulator responsible for protecting and improving Scotland's environment.
Scottish Natural Heritage (SNH) (NatureScot from August 2020)	Scottish public body responsible for protecting and promoting the natural heritage of Scotland. SNH was rebranded NatureScot from 24 August 2020. As ongoing consultation and the assessment was largely undertaken whilst SNH were still known by this name, NatureScot has been referred to throughout the DMRB Stage 2 Scheme Assessment Report as SNH.
Scottish Transport Appraisal Guidance (STAG)	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.
Scrub	Climax vegetation dominated by locally native shrubs, usually less than 5m tall.
Sedimentary Rock	One of the three main groups of rock types; rocks that have formed from hardened sediment.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.
Semi-Pelite	Rock formed from metamorphism of silt-rich sedimentary rocks such as siltstone.
Sense of Place	In landscape and visual impact assessment the term is used mainly with regards to place identity and is linked to the concept of <i>genius-loci</i> (literally meaning 'spirit of the place'). A sense of place responds to the essential character and spirit of an area and people's experience of this and their interaction with it.
Serpentinite	Medium to coarse grained rock formed from the metamorphic alteration of an ultrabasic / ultramafic protolith. Predominantly composed of the mineral serpentine, or containing bands or veins of serpentine.
Severance	The separation of communities from facilities and services they use within their community. Alternatively, in relation to agricultural land, the division of plots of land into separate land parcels, potentially affecting access or creating areas that may be impractical for agricultural use.
Shear Zone	A geological structure in which rocks have undergone intense deformation (either brittle or ductile).
Significant Effect	An effect which is of Major or Moderate magnitude.
Significance (of Effect)	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Siluro-Devonian	Refers to rocks formed at the boundary between the Silurian and Devonian periods, 408.5 million years ago, or to geological processes occurring at this time.
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain. The site network is protected under the provisions of Sections 28 and 19 of the Wildlife and Countryside Act 1981 as well as the Amendment Act 1985 and the Environmental Protection Act 1990.

Slate	Fine-grained foliated rock formed by low-grade regional metamorphism of clay-rich sedimentary rocks.
Slip Road	A connector road facilitating access between one road and another.
Soffit	Under surface (ceiling) of an enclosed space – e.g. bridge / chamber / pipe.
Sound Pressure Level	<p>The sound power emitted by a source results in pressure fluctuations in the air, which are heard as sound.</p> <p>The sound pressure level (L) is ten times the logarithm of the ratio of the measured sound pressure (detected by a microphone) to the reference level of 2×10^{-5}Pa (the threshold of hearing).</p> <p>Thus $L \text{ (dB)} = 10 \log (P/P_{\text{ref}})^2$ where P_{ref}, the lowest pressure detectable by the ear, is 0.00002 pascals (i.e. 2×10^{-5} Pa).</p> <p>The threshold of hearing is 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB_{LA} and a change of 3dB is only just detectable. A change of 10dB is subjectively twice, or half, as loud.</p>
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981. Under the Habitats Directive, all SPAs will be proposed Special Areas of Conservation.
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 or group with an interest or concern in something.
Stopping Sight Distance (SSD)	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 (SEA)	The process by which information about the environmental effects of proposed plans, policies and programmes are evaluated.
Strategic Transport Project Review (STPR)	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 from the present.
Supplementary Guidance	Detailed policy guidance adopted by a 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 the capacity of natural or artificial drainage is exceeded by water from rainfall.
Susceptibility	The ability to accommodate change arising from the proposed road without adverse effect.
Sustainable Drainage Systems (SuDS)	A sequence of management practices and control structures designed to drain surface water in a sustainable manner.
Syenite / Syenitic Rock	Coarse-grained light coloured felsic to intermediate intrusive igneous rock, formed from slow crystallization of felsic / silicic magmas. Feldspar constitutes >65% of the rock.
Symbol Stone	Typically unworked stones with carved symbols dating to the Pictish period (between 6th to 8th centuries AD).
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.
Threshold	The minimum intensity or value of a signal etc. that will produce a response or specified effect.
Thrust Fault	A low-angle geological fault in which rock on one side of the fault plane has been pushed above rock on the other side due to compressive forces.
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.
Transport and Economic Land-use Model of Scotland	Transport Scotland's national transport and economic land-use model. TELMoS provides independent demographic, planning and economic forecasts which form the basis for future travel demands. The current version is TELMoS14.

Transport Model for Scotland	Transport Scotland's national transport model. It is a multimodal, strategic transport model, covering all significant road and rail links throughout the country. It provides a broad representation of transport supply and estimates of transport demand. The current version is TMfS14 which has a base year of 2014 and future forecast years 2017, 2022, 2027, 2032 and 2037.
Tributary	A river or stream flowing into a larger river or lake.
Troctolite	Coarse-grained mafic / basic intrusive igneous rock. Key minerals are olivine and calcium-rich feldspars. Troctolite can be found in cumulate intrusions alongside gabbro rock.
Trunk Road	Strategic road network, recommended for long distance and freight transport, connecting major cities, towns, industry and ports. The Scottish Government is responsible for trunk roads in Scotland.
Ultrabasic Rock	Descriptive term for igneous rock with less than 45% silica by volume, and very high proportion of ferromagnesian minerals. Examples include Peridotite and Dunite.
Urban	In, relating to, or characteristic of a town or city.
Vein	Tabular deposit of minerals occurring in a fracture.
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.
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	Children, elderly and disabled.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Water Environment (Controlled Activities) (Scotland) Regulations	The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended). Statutory Regulations controlling all engineering activity in or near to the inland water environment, including watercourses, wetlands, open water and groundwater. The regulations govern the licensing of all such activity.
Water Framework Directive (WFD)	Wide-ranging European environmental legislation (2000/60/EC). Addresses inland surface waters, estuarine and coastal waters and groundwater. The fundamental objective of the WFD is to maintain "high status" of waters where it exists, preventing any deterioration in the existing status of waters and achieving at least "good status" in relation to all waters by 2015.

Water Quality	The chemical and biological status of various parameters within the water column and their interactions, for example dissolved oxygen, indicator metals such as dissolved copper, or suspended solids (the movement of which is determined by hydrological process and forms geomorphological landforms).
WebTAG	Online guidance documents for transport appraisal – Department of Transport May 2018.
Wildcat Priority Area	Boundaries of areas to be targeted for wildcat conservation, as defined by Scottish Natural Heritage (SNH, NatureScot from August 2020).
Wildlife and Countryside Act 1981	Principal mechanism for wildlife protection in the UK.
Worked Ground	Areas where the ground has been cut away, such as quarries and road cuttings.
Zone of Theoretical Visibility (ZTV)	A map (usually produced digitally) showing areas of land from which a development is or would be theoretically visible.

Abbreviations

AADT	Annual Average Daily Traffic
AAHF	Annual Average Hourly Flows
AAWT	Annual Average Weekday Traffic
AC	Aberdeenshire Council
ACAS	Aberdeenshire Council Archaeology Service
ADMS	Atmospheric Dispersion Modelling System
AMCB	Analysis of Monetised Costs and Benefits
AMVR	Assignment Model Validation Report
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
ARN	Affected Road Network
ASNO	Ancient of Semi-Natural Origin
ATC	Automatic Traffic Count
AWI	Ancient Woodland Inventory
AWPR	Aberdeen Western Peripheral Route
BAP	Biodiversity Action Plan
BCR	Benefit to Cost Ratio
bGL	Below ground level
BGS	British Geological Survey
BoCC	Birds of Conservation Concern
BS	British Standard
BT	British Telecom
BTL	Inventory Historic Battlefield
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
CCRA	Climate Change Resilience and Adaptation Assessment
CCRKA	Climate Change Risk Assessment
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists

CIRIA	Construction Industry Research and Information Association
CMS	Carbon Management System
CNMA	Candidate Noise Management Area
CO2	Carbon Dioxide
COBALT	COst and Benefit to Accidents – Light Touch software
COP 21	Conference of all Parties
CRAM	Corridor Road Assignment Model
D2AP	Dual 2 Lane Carriageway All Purpose
dB	Decibel
dB(A)	A-weighted decibel
DEFRA	Department of the Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
DS (Ec)	Do-Something for Economic Scenario
DS (Env)	Do-Something for Environmental / Operational Scenario
DTM	Digital Terrain Model
EAM	Early AM Peak
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ELC	The European Landscape Convention
ESG	Environmental Steering Group
FEH	Flood Estimation Handbook
FPS	Flood Protection Scheme
FRSA	Flood Risk Simple Assessment
FWPM	Freshwater Pearl Mussel
GCN	Great Crested Newt
GCR	Geological Conservation Review

GDL	Inventory Gardens and Designed Landscape
GHG	Greenhouse Gas
GIS	Geographic Information System
GLVIA	Guidance for Landscape and Visual Assessment
GWDTE	Groundwater Dependent Terrestrial Ecosystems
ha	Hectare
HAWRAT	Highways Agency Water Risk Assessment Tool
HDV	Heavy Duty Vehicle
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
HEWRAT	Highways England Water Risk Assessment Tool
HGV	Heavy Goods Vehicle
HIA	High Impact Area
HPA	Health Protection Agency
hr	Hour
HRA	Habitats Regulations Appraisal
IAN	Interim Advice Note
IAQM	Institute of Air Quality Management
ICCI	In-combination Climate Change Impact Assessment
ICD	Inscribed Circle Diameter
IEMA	Institute of Environmental Management and Assessment
IIP	Infrastructure Investment Plan
INNS	Invasive Non-Native Species
IRIS	Integrated Road Information System
JHI	James Hutton Institute
JNCC	Joint Nature Conservation Committee
JT	Journey Time
km	Kilometres
kph	Kilometres per hour
kV	Kilovolt

LA	Local Authority
LAQM	Local Air Quality Management
LB	Listed Building
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Assessment
LCfA	Land Capability for Agriculture
LCIP	Local Climate Impact Profile
LCT	Landscape Character Type
LDP	Local Development Plan
LEPO	Long Established Woodland of Plantation Origin
LiDAR	Light Detection and Ranging
LLCA	Local Landscape Character Area
LNCS	Local Nature Conservation Site
LTEA	Lead Traffic and Economics Advisor
LU	Landscape Unit
LV	Low Voltage
LVIA	Landscape and Visual Impact Assessment
m	Metre
MImAS	Morphological Impact Assessment System
MIR	Main Issues Report
MLURI	Macaulay Land Use Research Institute
MMP	Materials Management Plan
MMS	Mott McDonald Sweco
MW	Megawatt
N	Nitrogen
N2	Normal Containment Level
NBN	National Biodiversity Atlas
NCAP	National Collection of Aerial Photography
NCN	National Cycle Network
NESA	Network Evaluation from Surveys and Assignment
NeSBRc	North East Scotland Biological Recording Centre

NGR	National Grid Reference
NIA	Noise Important Areas
NIDL	Non-Inventory Designed Landscape
NMA	Noise Management Area
NMU	Non-Motorised User
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NPF	National Planning Framework
NPF3	National Planning Framework 3
NPV	Net Present Value
NRHE	National Record of the Historic Environment
NSA	National Scenic Area
NVC	National Vegetation Classification
NVZ	Nitrate Vulnerable Zone
NWI	Native Woodland Inventory
NWSS	Native Woodland Survey of Scotland
OS	Ordnance Survey
PAN	Planning Advice Note
PAS	Publicly Available Standard
PAWS	Plantations on Ancient Woodland Sites
PCM	Pollution Climate Mapping
PCU	Passenger Car Unit
PES	Preliminary Engineering Services
PIA/1000MVkm	Personal Injury Accidents per Million Vehicle Kilometres
PM ₁₀	Particulate Matter smaller than 10µm in aerodynamic diameter
PM _{2.5}	Particulate Matter smaller than 2.5µm in aerodynamic diameter
PRoW	Public Right of Way
PVA	Potentially Vulnerable Area
PVB	Present Value of Benefits
PVC	Present Value of Costs
PVY	Present Value Year

PWS	Private Water Supply
RBMP	River Basin Management Plan
RCAHMS	Royal Commission on Ancient and Historical Monuments of Scotland
RCP	Representative Concentration Pathways
RCS	River Corridor Surveys
RDWE	Road Drainage Water Environment
ReFH2	Revitalised Flood Hydrograph Model
RSPB	Royal Society for the Protection of Birds
RTA	Road Traffic Accident
SAC	Special Area of Conservation
SAQO	Scottish Air Quality Objective
SATURN	Simulation and Assignment of Traffic in Urban Road Networks
SBL	Scottish Biodiversity List
SCCAP	Scottish Climate Change Adaptation Programme
ScotWays	Scottish Rights of Way and Access Society
SDP	Strategic Development Plan
SDPA	Strategic Development Planning Authority
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SGN	Scottish Gas Networks
SHIAN	Scottish Health and Inequality Impact Assessment Network
SIMD	Scottish Index of Multiple Deprivation
SLA	Special Landscape Area
SLASG	Special Landscape Areas Supplementary Guidance
SM	Scheduled Monument
SMR	Sites and Monuments Record
SNH	Scottish Natural Heritage (NatureScot from August 2020)
SO	Scheme Objective
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSD	Stopping Sight Distance

SSE	Scottish and Southern Energy
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Appraisal Guidance
STPR	Strategic Transport Projects Review
SuDS	Sustainable Drainage Systems
SWT	Scottish Wildlife Trust
TAG	Transport Analysis Guidance
TAN	Technical Advice Note
tCO ₂ e	Tonnes of CO ₂ -equivalent
TEE	Transport Economic Efficiency
TELMoS	Transport and Economic Land-use Model of Scotland
TMfS	Transport Model for Scotland
TRL	Transport Research Laboratory
TS	Transport Scotland
TUBA	Transport Users Benefit Appraisal
UKCP	UK Climate Projections
VAT	Value Added Tax
VfM	Value for Money
VOC	Vehicle Operating Cost
vpd	Vehicles per day
VRS	Vehicle Restraint System
WCH	Walkers, Cyclists and Horse Riders
WEI	Wider Economic Impact
WFD	Water Framework Directive
WHO	World Health Organization
WPA	Wildcat Priority Area
ZTV	Zone of Theoretical Visibility

1 Scheme Background

1.1 Scheme Background

- 1.1.1 The Scottish Government's Strategic Transport Projects Review (STPR¹), 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 The Agenda for Cities was published by the Scottish Government in December 2011. The purpose of this 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 for Cities identifies connecting cities with strong, reliable and resilient transport infrastructure as a key characteristic to support growth.
- 1.1.3 The Scottish Government's plans for infrastructure investment over the coming decades was also published in December 2011 in the Infrastructure Investment Plan (IIP)². 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. This was followed up in May 2013 when the then Minister for Transport and Veterans set out how the A96 Dualling Programme would be taken forward over the coming years.
- 1.1.4 Transport Scotland commenced a Preliminary Engineering Services (PES) study in 2013, which included undertaking a Design Manual for Roads and Bridges (DMRB) Stage 1 Assessment for the initial development and assessment of broadly defined improvement strategies for the A96 Dualling Programme. A Strategic Environmental Assessment (SEA) was also undertaken in parallel to consider at a high level what effects the A96 Dualling Programme may have on the environment. The outcome of this preliminary engineering and strategic environmental assessment work was presented at a series of public information exhibitions along the A96 corridor between Forres and Aberdeen in May 2015.
- 1.1.5 Based on the outcome of the preliminary assessment work, it was proposed to progress the next stage of design, the DMRB Stage 2 assessment, in three programme wide geographical sections, in addition to the Inverness to Nairn (including Nairn Bypass) section which was at a more advanced stage of development. The sections are described below and shown in Figure 1.1:
- The Western Section extends from the tie-in of the Inverness to Nairn (including Nairn Bypass) scheme at Hardmuir (east of Auldearn) to east of Fochabers (approximately 46km);

¹ A second Strategic Transport Projects Review (STPR2) will replace the first STPR and is due to be delivered in two phases which are planned for completion in 2021.

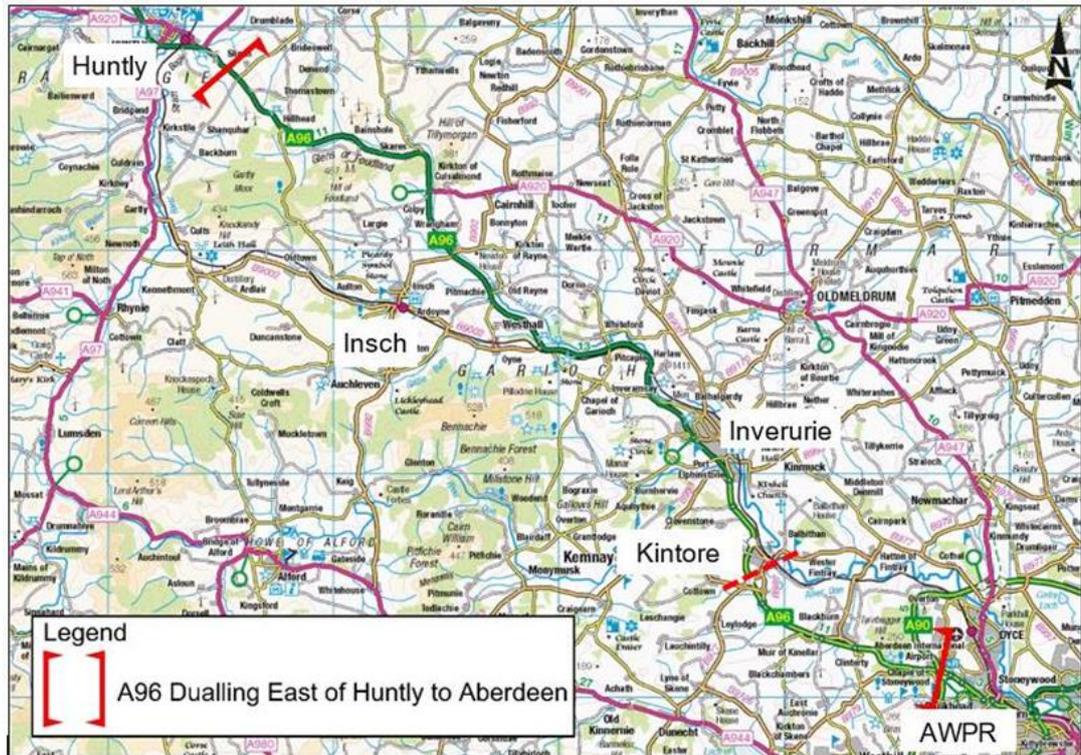
² The Scottish Government is consulting on a Draft Infrastructure Investment Plan for Scotland 2021-22 to 2025-26 (Draft IIP). A key theme of the Draft IIP is driving inclusive economic growth with the aim to strengthen connectivity to '... ensure the right connections within Scotland and internationally' and that the Scottish Government will 'Continue design and development work to dual the A96.'

- The Central Section extends from east of Fochabers to east of Huntly (approximately 31km); and
- The Eastern Section extends from east of Huntly to Aberdeen (the existing A96 Junction with the Aberdeen Western Peripheral Route (AWPR)) (approximately 48km).



Figure 1.1 A96 Dualling Programme Sections

- 1.1.6 In July 2017, Amey OW Ltd and Ove Arup and Partners Ltd (AmeyArup), under a Joint Venture agreement, were appointed by Transport Scotland for the purposes of delivering a scheme covering the Eastern Section of the A96 Dualling Programme, East of Huntly to Aberdeen. The approximate scheme extents are shown in Figure 1.2.
- 1.1.7 Transport Scotland has determined that the western extent of the scheme ties in to the existing A96, at a location to the east of Huntly, allowing a future dualling scheme to be developed westwards towards Huntly and beyond (i.e. the Central Section). The eastern end of the scheme extends to the existing A96 junction with the AWPR, located at Craibstone.
- 1.1.8 This report covers the section of the scheme from East of Huntly to the existing dualled section of A96 at Kintore (Gauchhill Junction). For the purposes of this report, this section will be referred to as ‘the scheme’. An assessment of the existing dual carriageway between Kintore and the A96 junction with the AWPR at Craibstone will be reported on separately when the DMRB Stage 2 route option assessment for that section is taken forward.



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Figure 1.2 Scheme Extents

1.2 A96 Aberdeen - Inverness Trunk Road

- 1.2.1 The existing A96 between Aberdeen and Inverness is approximately 160km (99 miles) in length and consists mostly of single carriageway with some overtaking lengths and sections of dual carriageway.
- 1.2.2 At the western end of the trunk road, at Inverness, there is a short length (less than one kilometre) of dual carriageway between the Raigmore Interchange (with the A9) and the roundabout at the Inverness Retail and Business Park. At the eastern end of the existing A96, dualling extends for approximately 20km from Inverurie Roundabout, south-east of Inverurie, to Haudagain Roundabout in Aberdeen. The existing length of dual carriageway also provides connection to the Aberdeen Western Peripheral Route at Craibstone.
- 1.2.3 Between Inverness and Aberdeen, it passes through, or close to, the larger settlements of Nairn, Forres, Elgin, Fochabers, Keith, Huntly and Inverurie.
- 1.2.4 Within the single carriageway sections there are six eastbound overtaking lanes with a combined length of approximately 5.9km and six westbound overtaking lanes with a combined length of approximately 6.3km.
- 1.2.5 There are approximately 600 at-grade junctions and accesses along the rural sections of the existing A96 where the national speed limit applies. There are grade separated junctions with the A9 at Raigmore, the B987 at Kintore (Tavelty Junction) and the B977 (west facing slip roads only) also at Kintore (Gauchhill Junction).

1.3 Previous Studies

- 1.3.1 Previous studies have been undertaken 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, where relevant, taken previous studies, reports and consultations into consideration.

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

- 1.3.2 This report determines that the dualling of the A96 is best able to meet the transport planning objectives and that the appraisal evidence demonstrates options for further improving the transport links between Inverness and Aberdeen over and above existing commitments should be road-based infrastructure interventions. The report concludes that 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, Transport Scotland, 2014

- 1.3.3 This study identifies baseline environmental conditions and constraints along the A96 corridor. Initial improvement strategies were considered in isolation, providing an assessment of the predicted environmental effects 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, Transport Scotland, 2015

- 1.3.4 This report was commissioned to ensure that potential environmental effects were considered from the earliest stages of the A96 Dualling Programme development. A comparative assessment was undertaken between 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 better inform the development of alternative route alignment options in the next stages of the A96 Dualling design and assessment.

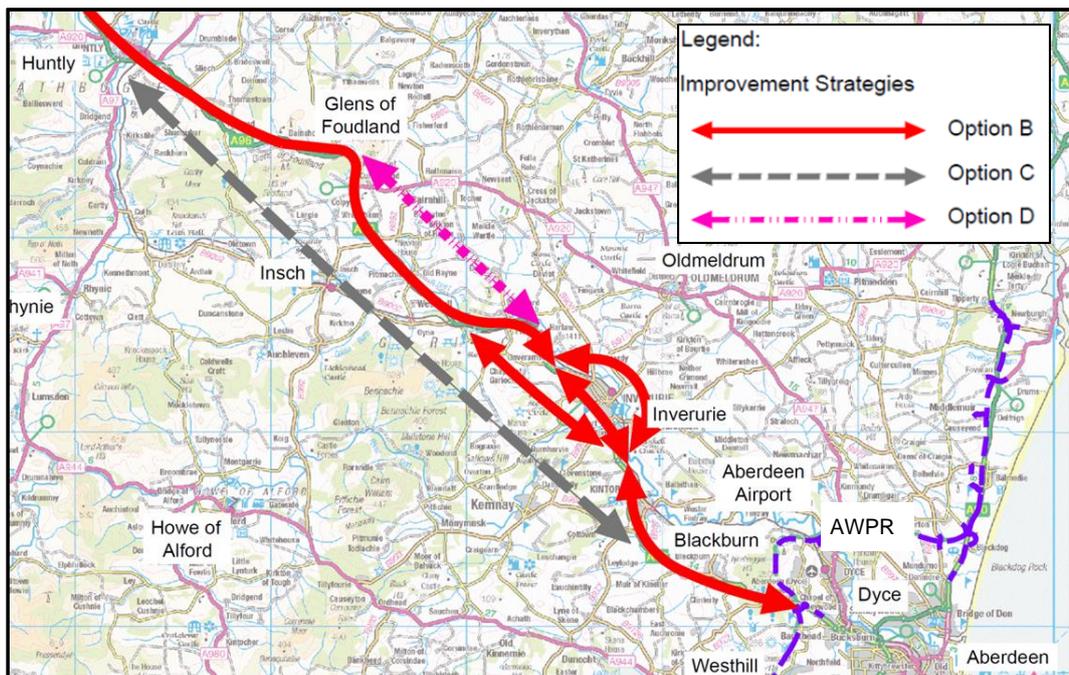
A96 Dualling Inverness to Aberdeen – Preliminary Engineering Services: DMRB Stage 1 Assessment, Transport Scotland, 2013-2015

- 1.3.5 Transport Scotland commissioned consultants to undertake preliminary engineering assessment work for dualling the A96 (excluding the Inverness to Nairn section, refer to Paragraph 1.5.2), which included preparation of a DMRB Stage 1 Assessment report.
- 1.3.6 The DMRB Stage 1 Assessment report details the sifting process that was undertaken on broadly defined Improvement Strategies. This resulted in four improvement strategies being recommended for further consideration at the next stage of development (i.e. DMRB Stage 2 Assessment).
- 1.3.7 Within the East of Huntly to Aberdeen section of the A96, three Improvement Strategies were recommended for further consideration as part of the DMRB Stage 2 assessment process (refer to Figure 1.3):

- Improvement Strategy Option B – follows the route of the existing A96 corridor and includes offline bypasses of settlements along the existing A96;

- Improvement Strategy Option C – offline alternative to provide a more direct route from Huntly to Blackburn, bypassing Inverurie to the south and avoiding several sections of poor road alignment on the existing A96; and
- Improvement Strategy Option D – offline alternative to provide a more direct line between the A96 at the Glens of Foudland and the A96 north-west of Inverurie.

1.3.8 The outcome of the DMRB Stage 1 Assessment was presented to the public at a series of exhibitions held between 11 and 21 May 2015.



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Figure 1.3 DMRB Stage 1 Improvement Strategy Options

1.4 Stakeholders

1.4.1 There are numerous stakeholders with interests in the scheme, including but not limited to:

- MSPs, MPs and local Councillors;
- Statutory Consultees:
 - Transport Scotland;
 - Aberdeenshire Council;
 - Aberdeen City Council;
 - North East of Scotland Transport Partnership (Nestrans);
 - Scottish Environment Protection Agency (SEPA);
 - Scottish Natural Heritage (SNH);
 - Historic Environment Scotland (HES);
 - Health and Safety Executive; and

- Network Rail.
- Statutory Undertakers, including:
 - Scottish Water;
 - SSE;
 - National Grid;
 - Scotland Gas Networks (SGN); and
 - Telecommunications companies including BT Openreach.
- Non-Statutory environmental organisations, including:
 - Royal Society for the Protection of Birds;
 - Forestry and Land Scotland / Scottish Forestry;
 - Scottish Wildcat Action;
 - River Don Trust; and
 - Scottish Wildlife Trust.
- Other Consultees, including:
 - National Farmers Union;
 - Community Councils; and
 - Landowners and residents.

1.4.2 Public Exhibitions were first held in November 2013 for the A96 Preliminary Engineering Services work undertaken for the overall A96 Dualling Programme (see Paragraph 1.3.5). These were to provide information on the assessment, design and development process to be undertaken to provide a dual carriageway between Inverness and Aberdeen. This was the start of a programme of engagement with local communities and other stakeholders which has and will continue throughout the development work that is being undertaken.

1.4.3 To date, the A96 Dualling East of Huntly to Aberdeen scheme has included meetings with statutory and non-statutory stakeholders, public 'Meet the Team' events in November 2017, an 'Initial Route Options Public Exhibitions' in October 2018, 'Design Update Public Drop-In Sessions' in May 2019 and an online design update in October 2020.

1.4.4 This ongoing engagement is designed to ensure that individuals, communities and businesses affected by the dualling works are kept informed, consulted and their feedback considered as the proposals are developed.

1.5 Other 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 several work packages, including:

- Development of a corridor model for the A96 to provide an audited traffic model for use by the A96 Dualling Programme design consultants;
- Business Case Development 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.

1.5.3 The draft Orders and Environmental Statement were published on 29 November 2016, which resulted in a Public Local Inquiry being held between 30 October and 20 November 2018. The Reporters submitted their report to Scottish Ministers for consideration on 17 October 2019 and, at the time of writing this report, this is under active consideration.

A96 Dualling Hardmuir to Fochabers (Western Section - see Figure 1.1)

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

1.5.5 The DMRB Stage 2 Preferred Option was published for the scheme in December 2018.

A96 Dualling Fochabers to East of Huntly (Central Section – see Figure 1.1)

1.5.6 Route options assessment work for the central section of the A96 between Fochabers and east of Huntly has not yet been commissioned.

1.6 Programme and Scheme Objectives

A96 Dualling Programme Objectives

1.6.1 The programme objectives established for the A96 Dualling Programme were developed from the Inverness to Aberdeen Corridor Study Strategic Business Case objectives and are as follows:

- To improve the operation of the A96 and inter-urban connectivity between the cities of Inverness and Aberdeen and their city regions through:
 - Reduced journey times;
 - Improved journey time reliability; and
 - Reduced conflicts between local and strategic journeys.
- To improve safety for motorised and non-motorised users through:
 - Reduced accident rates and severity; and
 - Reduced driver stress.
- 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; and
- To reduce the environmental effect on the communities in the corridor.

A96 Dualling East of Huntly to Aberdeen Scheme Objectives

1.6.2 AmeyArup developed scheme specific objectives to support and supplement the Programme Objectives. These Scheme Objectives (SO) were agreed with Transport Scotland at an Inception Workshop on 6 October 2017 and are shown in Table 1.1. These have subsequently been used to appraise options throughout the DMRB Stage 2 design development and assessment process.

Table 1.1 A96 Dualling East of Huntly to Aberdeen Scheme Objectives

No.	Objective
SO1	To improve the operation of the A96 and inter-urban connectivity through: <ul style="list-style-type: none"> • SO1.1 - Reduced journey times; • SO1.2 - Improved journey time reliability; • SO1.3 - Increased overtaking opportunities; • SO1.4 - Improved efficiency of freight movements along the transport corridor; • SO1.5 - Reduced conflicts between local traffic and strategic journeys; and • SO1.6 - Improved network resilience.
SO2	To improve safety for motorised and non-motorised users through: <ul style="list-style-type: none"> • SO2.1 - Reduced accident rates and severity; • SO2.2 - Reduced driver stress; and • SO2.3 - Reduced potential conflicts between Motorised and Non-Motorised Users.
SO3	To provide opportunities to grow the regional economies on the corridor through: <ul style="list-style-type: none"> • SO3.1 - Improved access to the wider strategic transport network; and • SO3.2 - Enhanced access to jobs and services.
SO4	To facilitate active travel in the corridor.
SO5	To facilitate integration with Public Transport Facilities.
SO6	To avoid significant environmental impacts and, where this is not possible, to minimise the environmental effect on: <ul style="list-style-type: none"> • SO6.1 - The communities and people in the corridor; and • SO6.2 - Natural and cultural heritage assets.

1.7 Overview of Stage 2 Report

General

- 1.7.1 This DMRB Stage 2 Scheme Assessment Report has been prepared in accordance with design guidance document TD 37/93, Scheme Assessment Reporting.
- 1.7.2 The purpose of this report is to document the factors that have been considered in the assessment of route options, taking account of the scheme objectives and the engineering, environmental, traffic and economic advantages / disadvantages and constraints associated with each route option.
- 1.7.3 Figures showing the route options assessed are included in Volume 5 of this report.

Report Layout

- 1.7.4 This report has been divided into 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:
 - Part 4 – Traffic and Economic Assessment; and
 - Part 5 – Assessment Summary and Preferred Option.
 - Volume 4 – Appendices; and
 - Volume 5 – Engineering, Environmental and Traffic Figures.

Report Availability

- 1.7.5 This report can be viewed at and downloaded from the Transport Scotland website:
<https://www.transport.gov.scot/projects/a96-dualling-inverness-to-aberdeen/a96-east-of-huntly-to-aberdeen/>
- 1.7.6 A bound paper copy of the complete A96 Dualling East of Huntly to Aberdeen 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 “Major Projects Directorate, Transport Scotland, Buchanan House, 58 Port Dundas Road, Glasgow, G4 0HF”.

2 Existing Conditions

2.1 Introduction

- 2.1.1 This Chapter of the report describes the engineering and traffic conditions of the existing A96 Aberdeen to Inverness Trunk Road within the scheme extents from East of Huntly to Kintore (Gauchhill Junction) as shown in Chapter 1, Figure 1.2. Throughout the report the current A96 Trunk Road is commonly referred to as the 'existing A96'. Descriptions detailed in Section 2.2 generally run from its western extents, east of Huntly, to the eastern extents at Kintore (Gauchhill Junction).
- 2.1.2 The existing A96 and the wider local road networks are shown in Volume 5, Figures 2.2 to 2.6.
- 2.1.3 The environmental baseline conditions are outlined in Volume 2, Part 3 Environmental Assessment within each topic chapter.

2.2 Scheme Location and Environment

Location

- 2.2.1 The scheme starts approximately 2km south-east of the junction between the existing A96 and A97 (Banff-Aberchirder-Huntly Road) and runs in a generally northwest to southeast direction for approximately 38km before it ends at Gauchhill Junction (A96/B977) at Kintore. For the purposes of this report, directions on the existing A96 are described as eastbound and westbound. The study area is based on the boundary set by the Strategic Environmental Assessment (SEA) as described in Paragraph 1.3.4. It extends approximately 7.5km either side of the existing A96. The northern boundary passes close to Rothienorman and Oldmeldrum, and the southern boundary passes close to Kennethmont and Kemnay.

Topography

- 2.2.2 From Huntly, the existing A96 heads south-east and rises through rolling hills to the highest road elevation of approximately 275m Above Ordnance Datum (AOD) at Hillhead, before passing through the Glens of Foudland along the valley, parallel to the Glen Water. The valley is defined by the Hill of Bainshole to the north and the Hill of Foudland to the south. The existing A96 and Glen Water then pass between steep sided slopes of the Hill of Skares and Hill of Tillymorgan.
- 2.2.3 At Colpy, the existing A96 turns southwards on a falling gradient to pass through gently rolling farmland following the general south-easterly direction of the River Urie.
- 2.2.4 Approaching Pitcable, the landscape character continues into a rolling landscape of wide valleys and shallow slopes with the settlements of Inverurie and Port Elphinstone located on the lower slopes of the river valley at the confluence of the River Urie and River Don. The existing A96 continues in the general south-easterly direction following the wide valley of the River Don to the settlement of Kintore.

Climate

- 2.2.5 The climate in the study area is influenced by being in the shadow of the Cairngorm mountains. Data extracted from Met Office reports from 1981 to 2010 for the nearest weather station at Fyvie Castle (located north of Oldmeldrum) shows the area having lower than average rainfall, ranging from 58mm to 98mm per month

compared to the Scottish average rainfall range of 84mm to 177mm per month. The weather station nearest the eastern end of the study area at Dyce airport also recorded similar lower than average rainfall ranging from 55mm to 96mm per month.

- 2.2.6 The study area has more hours of sunshine per month ranging from 41 hours to 201 hours for Fyvie Castle and 46 hours to 199 hours for Dyce Airport compared to the Scottish average range of 30 hours to 178 hours per month.
- 2.2.7 The western upland extents of the study area have more air-frost days per year at 78 days compared to the Scottish average of 67 days per year. By contrast the eastern lowland extents have slightly lower annual number of air-frost days at 57. This is replicated in the average temperatures, with the western extents recording slightly lower average minimum temperatures during the winter months when compared to the rest of Scotland whereas the rest of the study area has a slightly higher average minimum temperature over the same period. During the summer months, the study area records higher average maximum temperatures compared to the Scottish average. Overall, the annual average maximum temperature across the study area is higher at 12°C, than the Scottish national annual average of 11°C.
- 2.2.8 No data is recorded for average annual windspeed at the weather stations or reported nationally.
- 2.2.9 Met Office data from 1981 to 2010 shows that within the vicinity of the existing A96, days with snowfall varies between 43 at Hillhead and 32 at Kintore annually, compared to the national average of 38 days. Days with snow lying varies from 33 at Hillhead to 22 at Kintore annually, compared to the national average of 26 days.

Land Use

- 2.2.10 The land within the study area is primarily agricultural. There are also areas of woodland, transportation infrastructure, residential properties and other commercial entities.
- 2.2.11 The larger settlements of Inverurie and Kintore lie adjacent to the existing A96 at the eastern end of the scheme and have a mixture of residential, commercial and industrial properties.
- 2.2.12 Oldmeldrum lies near the northern boundary of the study area whilst Inch and Kemnay are to the south. Between Inch and Kemnay, Bennachie provides a recreational facility for the surrounding area.
- 2.2.13 Significant areas of former farmland around Inverurie have been developed into residential land use in recent years, particularly at Mains of Blackhall and Uryside. Further development is possible at sites on the edges of Inverurie, such as the proposed Crichton development near Port Elphinstone.

Agriculture

- 2.2.14 There is a high proportion of agricultural land throughout the study area. Farms vary in size and type, ranging from small, traditional units to large agri-businesses occupying multiple land parcels. This very mixed farming incorporates improved grass, arable crops (cereals, oilseed rape), rough grazing, vegetables and others including poultry, pigs and dairy production.

Woodland

- 2.2.15 Woodland in the study area is formed of distinctive pockets of deciduous woodlands and coniferous plantations, although there is broad-leaved policy

woodland around some of the large houses particularly at Williamston House, around Logie Durno and Pitcaple, Leith Hall and Keith Hall.

- 2.2.16 Some of the woodland blocks are designated as long-established woodland of plantation origin in the Ancient Woodland Inventory (AWI), meaning that they have supported plantation woodland since at least 1860.

Man-made Features

Existing Roads

- 2.2.17 The existing road network is described in more detail in Section 2.3 using the road names listed in Table 2.1. These include all A-class, B-class, C-class and unclassified local roads based on Aberdeenshire Council's list of adopted roads that connect with or cross the existing A96 or are within the scheme extents.
- 2.2.18 It should be noted that the existing A96 from Raigmore Interchange at Inverness to the junction with the A95 at Keith is part of an existing high load route which runs from Fraserburgh Harbour to Inverness and is classified as an 18ft route. The remainder of the A96 between Keith and Aberdeen (i.e. including the scheme extents) does not form part of the High Load Grid³.

Table 2.1 List of Existing Roads

Classification	Road Name
A Class Roads	
A96 (T)	A96 Aberdeen – Inverness Trunk Road (Aberdeen – Inverurie – Huntly)
A920	Ellon – Oldmeldrum – Colpy and Huntly – Dufftown Road
B Class Roads	
B992	Whitehouse – Keig – Auchleven – Inch – Mill of Newton – Culsalmond – Fisherford – Auchterless Road
B9002	Oyne – Kennethmont and Lumsden – Cabrach Road
B9001	Inverurie – Drum of Wartle – Rothienorman – Fergie Road
B9144	Blackhall Road – West High Street
B9170	Inverurie – Oldmeldrum – Methlick – New Deer Road
B993	Whiterashes – Inverurie – Kemnay – Tillyfourie – Millbank – Torphins Road
B994	Midmill – Kemnay Road
B987	Kintore Road
B977	Echt – Dunecht – Lyne of Skene – Kintore – Hatton of Fintray – Parkhill – Belhelvie – Balmedie Road
C Class Roads	
C79S	Gartly – Bothwellseat – Dummies Road

³ The High Load Grid is a collection of advisory routes for extremely high loads. This is aimed at assisting the haulage industry plan moves and ensuring routes are maintained to agreed capacities. The high load routes are either 18' or 20'.

Classification	Road Name
C81S	Slioch – Drumblade – Cruchie Road
C66S	Insch – Dunnydeer – Wraes Road
C82S	Newtongarry – Brideswell – Drumblade Road
C87S	Fordmouth – Stoneyhill – Placemill Road
C68S	Insch – Largie – Colpy Road
C64S	Brankanentum – Culsalmond – Fisherford Road
C59S	Old Rayne – Lathries – North Rayne Road (Lawrence Road)
C60S	Old Rayne – Auchintarph Road
C120C	Inverurie – Drimmies – Chapel of Garioch – Mill of Carden
C117C	Pitcaple – Chapel of Garioch – Blairdaff – Kemnay Road
C83C	Durno Road
C76C	Whiteford – Fingask Road
C116C	Dalbraidie – Burnhervie – Inverurie Road
C69C	Inverurie – Old Bourtie Road
C67C	Kinmuck Road
C68C	Heatherwick Road
C113C	Townhead Road (Forest Road)
U Class Roads	
U82S	Thomastown Road
U85S	Drumblade – Begshill Road
U70S	Colpy – Jericho and Bainshole – Bog – Clinkstone Roads
U68S	Greenhall – Wrangham
U44S	Bush – Mains of Bogfouton – Auchentender Road
U64S	Williamston and Greystone Roads
U61S	Pitmachie – Daies Road
U61S	Pitmachie – Oyne Road
U128S	Old Rayne Strathorn Road and streets in Old Rayne
U84C	Logie Durno Road
U85C	Streets in Durno
U201C	Streets in Whiteford
U117C	Drumduro Road and streets in Chapel of Garioch
U120aC	Mains of Balquhain – Netherton – Dubston Road
U83C	De-trunked section of A96T (Inveramsay)
U77C	Mackstead – Daviot Road
U81C	Harlaw – Hill of Den – Inveramsay Road
U80C	Drimmies – Mill of Inveramsay Road

Classification	Road Name
U82C	Auchencleith – Bourtie – Lethenty Road
Unclassified	Portstown Link Road
U115C	Dalmadilly – Aquhythie Road
U114C	Thainstone Road
U113C	Tom's Forest Road
U72C	Hillhead – Bourtie House Road
U196C	Townhead – Cottown Hill Road
U103C	Harthill Road

2.2.19 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.

2.2.20 Junctions between the existing A96 and other roads listed in Table 2.1 are referenced by their classification, e.g. 'the A920 Junction'.

Railway Lines

2.2.21 The Aberdeen to Inverness Railway Line is approximately 174km (108 miles) long and currently has nine intermediate stations from east to west: Dyce, Kintore, Inverurie, Inch, Huntly, Keith, Elgin, Forres and Nairn. Three of these stations fall within the study area, namely Kintore, Inverurie and Inch.

2.2.22 For the purposes of this report, the following description is from north-west to south-east. Heading south from Huntly, the railway line is remote from the A96 following the A97 south through Strathbogie, before running east from Gartly and following the route of the B9002, passing to the south of Inch and north of Oyne.

2.2.23 The railway line then runs south of and parallel to the existing A96 from the B9002 Junction known as Oyne Fork, running east to the south of Pitcaple before passing under the existing A96 at Inveramsay. It then crosses the River Urie at Milton of Inveramsay and then runs east, crossing back over the River Urie at Conglass and continuing to the north of Inverurie and south of the River Don to Kintore.

Residential Properties

2.2.24 The main residential settlements located within the study area are Inverurie and Kintore along with the smaller settlements of Kemnay, Oldmeldrum and Inch.

2.2.25 The populations of these settlements, as recorded in the National Records of Scotland 2016, are:

- Inverurie – 13,640;
- Kintore – 4,790;
- Kemnay – 3,870;
- Oldmeldrum – 3,140; and
- Inch – 2,690.

- 2.2.26 The Aberdeenshire Local Development Plan (LDP) 2017 also identifies the following smaller settlements: Chapel of Garioch, Durno, Daviot, Gartly, Hatton of Fintry, Keithhall, Kennethmont, Kinmuck, Meikle Wartle, Old Rayne, Oyne and Whiteford.
- 2.2.27 Various individual residential properties are scattered throughout the study area, some of which take direct access from the existing A96.

Commercial and Industrial Areas

- 2.2.28 The commercial and industrial premises are primarily located within the larger urban areas of Inverurie and Kintore at the eastern end of the study area. There are several small industrial areas within smaller settlements, along the rural areas adjacent to the existing A96, some of which take access directly from the road.
- 2.2.29 Agricultural land use is described in Paragraph 2.2.14. Support businesses, for example grain storage and the Aberdeen and Northern Marts Thainstone Centre, are also within the study area.
- 2.2.30 There are three main operational aggregate quarries within the study area, namely Pitcaple Quarry, Tom's Forest Quarry and Kemnay Quarry.
- 2.2.31 The locations of the main commercial and industrial areas are listed in Table 2.2:

Table 2.2 Commercial and Industrial Areas

Settlement	Industrial areas
Inverurie	Highclere Business Park, Blackhall Industrial Estate, Harlaw Industrial Estate, Inverurie Business Park, Kirkwood Commercial Park, Thainstone Business Park, Aberdeen and Northern Marts Thainstone Centre
Kintore	Midmill Business Park, Kintore Business Park
Oldmeldrum	Meadows Industrial Estate, Colpy Road Industrial Estate, Oldmeldrum Business Centre
Insch	Insch Business Park

- 2.2.32 The main retail and service centres are Inverurie, Kintore, Kemnay, Oldmeldrum and Insch.

2.3 Existing Road Network

Introduction

- 2.3.1 For the purposes of this report, the existing road network has generally been divided into four sections geographically. The geographical sections are listed below and shown on Figure 2.1 and in Volume 5, Figures 2.2 to 2.6.
- East of Huntly to Colpy;
 - Colpy to Drimmies;
 - Drimmies to Inverurie Roundabout; and
 - Inverurie Roundabout to Kintore (Gauchhill Junction, with B977).



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Figure 2.1 Existing A96 Geographical Sections

Geometric Design Standards

- 2.3.2 The existing A96 between East of Huntly and Inveramsay is a single carriageway and unless noted otherwise in the following descriptions is approximately 7.3m wide (two 3.65m lanes) with no hard strips.
- 2.3.3 Between Inveramsay and Inverurie Roundabout, the existing A96 includes 1m hard strips in each direction.
- 2.3.4 The existing A96 between Inverurie Roundabout and Gauchhill Junction is a dual 2 lane all-purpose dual carriageway and unless otherwise noted consists of a 7.3m carriageway (two 3.65m lanes) with 1m hard strips in each direction.

Existing A96

- 2.3.5 A review of the compliance of the existing A96 with current design standards has been undertaken. The horizontal and vertical alignment characteristics of the existing A96 have been obtained from a representative model of the existing road based on LiDAR (aerial) surveys and Ordnance Survey mapping information. For the purposes of this assessment, the visibility envelope was not extended beyond the back of the verge.
- 2.3.6 The horizontal and vertical geometry and stopping sight distance (SSD) on the existing A96 were checked against the requirements of Design Manual for Roads and Bridges (DMRB) CD 109 Highway link design to identify where there are relaxations within standards and departures from standards. In accordance with CD 109, a design speed of 100Akmph was utilised for the assessment of the single carriageway section and 120Akmph for the dual carriageway section.
- 2.3.7 The assessment of existing geometric standards is limited by the mapping and survey information available on 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.

- 2.3.8 The single carriageway and dual carriageway sections were assessed in accordance with DMRB CD 127 Cross sections and headrooms.
- 2.3.9 A characteristic of the existing A96 is the number of private accesses that connect directly with the existing A96. In total, 188 private accesses were identified within the scheme extents, in addition to the local roads listed in Table 2.1. The geometric assessment only considers the major / minor junctions with public roads along the route.
- 2.3.10 An assessment of existing design standards was undertaken. A total of 116 relaxations and 114 departures from standard have been identified between East of Huntly to Kintore (Gauchhill Junction), comprising:
- 34 relaxations from desirable minimum standards to the horizontal geometry, none of which constitute departures from standard;
 - 8 departures from standard relating to the horizontal curvature;
 - 4 relaxations from desirable minimum standards to the vertical geometry in terms of less than desirable minimum gradient;
 - No relaxations or departures were found in relation to vertical curvature;
 - 42 eastbound and 36 westbound relaxations from desirable minimum standards relating to SSD;
 - 36 eastbound and 35 westbound departures from standard relating to SSD; and
 - 35 departures from standard caused by the non-permitted combination of relaxations to horizontal, vertical and SSD.
- 2.3.11 The number of departures take account of SSD relaxations on the approach to major / minor junctions with public roads. The total number of departures and relaxations demonstrates the substandard nature of the existing road.

Junction Design Standards

Major / Minor Junctions

- 2.3.12 The main criteria for junction compliance, in accordance with DMRB CD 123 Geometric design of at-grade priority and signal-controlled junctions, 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.

Roundabouts

2.3.13 The criteria for roundabout compliance is contained in DMRB CD 116 Geometric design of roundabouts. The following are the key criteria checked for compliance:

- Entry width ratio;
- Entry lane width;
- Entry kerb radius;
- Entry path radius;
- Flare length;
- Exit width;
- Exit kerb radius;
- Approach visibility;
- Entry visibility;
- Visibility to the right; and
- Circulatory Visibility.

Grade Separated Junctions

2.3.14 Existing grade separated junctions on the existing A96 were assessed in line with DMRB CD 122 Geometric design of grade separated junctions and DMRB CD 127 Cross sections and headrooms. Lane widths, nose lengths and tapers and slip road lengths were checked for compliance. Refer to Table 2.9 for more details. The compliance of junctions on the existing A96 is discussed in Sections 2.4 to 2.7 covering the four geographical sections as described in Paragraph 2.3.1.

2.4 East of Huntly to Colpy

2.4.1 This section of the existing A96 is shown in Volume 5, Figures 2.2 and 2.3.

Existing A96 Route Description

2.4.2 This section of the existing A96 starts at the staggered junction with C79S and C81S adjacent to Leys of Dummuies. The route heads south-east past the Hill of Dummuies, the U82S, Ramstone Hill and several private accesses to Broom Hill. A staggered priority junction of the C82S and the C66S is situated at Hillhead.

- 2.4.3 The existing route has been upgraded to include a climbing lane in the eastbound direction between West Adamston and Hillhead and in the westbound direction between Wedderburn and Broom Hill.
- 2.4.4 From Hillhead, the route follows the Glens of Foudland, running parallel to the Glen Water. There are several local, private and field accesses for Wedderburn, Braehead, Bainshole, Midtown, Bog Farm, Mid Bog and East Bog.
- 2.4.5 East of Bainshole, the route passes the property at Skares before rounding the northern and eastern slopes of the Hill of Skares. A segregated parking lay-by is present to the east of Skares and a junction with the C87S is 220m further east.
- 2.4.6 From the Hill of Skares, the route heads due south, past a lay-by/access for Morgan McVeighs restaurant and shop, until the priority junction with the A920 and the settlement of Colpy to the west.
- 2.4.7 This section is approximately 12km long.

Speed Limits

- 2.4.8 The national speed limit applies throughout this section which is illustrated in Volume 5, Figures 2.7 and 2.8.

Geometric Design Standards

- 2.4.9 An assessment of the existing design standards has been carried out as outlined in Section 2.3.

Relaxations and Departures

- 2.4.10 In total, 34 Relaxations and 21 Departures from standard have been identified within this section for 100Akph Design Speed. Most of the Departures result from combinations of Relaxations encompassing substandard SSD and horizontal alignment. A SSD lower than the desirable minimum is included in almost all the Departures in this section.

Junction Provision

- 2.4.11 There are 73 private accesses identified on this section. Junctions with public roads included within the Aberdeenshire Council list of roads have been assessed for compliance with standards. Refer to Table 2.1 for the list of public roads and Volume 5, Figures 2.2 and 2.3 for locations of these roads.
- 2.4.12 The location, description and compliance with current design standards of all major / minor priority junctions on this section of the existing A96 are outlined in Table 2.3 and Paragraphs 2.4.14 to 2.4.19.
- 2.4.13 There are no roundabouts on this section.

Table 2.3 Major / Minor Priority Junctions – Existing A96 East of Huntly to Colpy

Junction	Compliance with CD 123 Standard				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Corner Radius
C79S Gartly – Bothwellseat – Dummuies Road	✓	✓	✓	x	x
C81S Slioch – Drumblade – Cruchie Road	✓	✓	x	x	✓

Junction	Compliance with CD 123 Standard				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Corner Radius
U82S Thomastown Road	✓	✗	✓	✓	✗
C66S Inch – Largie – Wraes Road	✓	✓	✓	✓	✓
C82S Newtongarry – Brideswell – Drumblade Road	✓	✓	✓	✓	✗
U70S Bainshole – Bog – Clinkstone Road	✓	✗	✓	✓	✗
C87S Fordmouth – Stoneyhill – Placemill Road	✗	✗	✗	✓	✗
A920 Ellon – Oldmeldrum – Colpy Road	✓	✓	✓	✓	✓

C79S Gartly – Bothwellseat – Dummuies Road Junction and C81S Sloch – Drumblade – Cruchie Road Junction

- 2.4.14 This is a ghost island staggered T-junction with right turn lanes connecting to the C79S to the south and the C81S to the north. The C79S provides access to Gartly with a private access road immediately south of the junction with the existing A96. The C81S provides access to Drumblade.

U82S Thomastown Road Junction

- 2.4.15 This is a simple T-junction connecting the U82S north of the existing A96 which provides access to Thomastown

C66S Inch – Largie – Wraes Road Junction and C82S Newtongarry – Brideswell – Drumblade Road Junction

- 2.4.16 This is a ghost island staggered T-junction with right turn lanes connecting the C66S to the south and the C82S to the north. The C66S provides access to Wraes and Largie as well as to Inch further to the south. The C82S lies to the north of the existing A96, providing access to Brideswell.

U70S Bainshole – Bog – Clinkstone Road Junction

- 2.4.17 This is a simple T-junction connecting the U70S south of the existing A96 which provides access to Clinkstone. There is a field access directly opposite the junction.

C87S Fordmouth – Stoneyhill – Placemill Road Junction

- 2.4.18 This is a simple T-junction connecting the C87S, north of the existing A96 which provides access to Wells of Ythan.

A920 Ellon – Oldmeldrum – Colpy Road Junction

- 2.4.19 This is a ghost island T-junction with right turn lane which connects to the A920 east of the existing A96, providing access to Oldmeldrum. There is a field access directly opposite the junction.

2.5 Colpy to Drimmies

2.5.1 This section of the existing road network is shown in Volume 5, Figures 2.3 to 2.5.

Existing A96 Route Description

2.5.2 From Colpy, this section of the existing A96 heads south-east, parallel with the River Urie. There are numerous direct private and field accesses onto the existing route including one for Loch Inch Fishery to the south-west. Heading south-east, the existing A96 connects with the B992 and then crosses the Kellock Burn at the Kellockbank Country Emporium and restaurant.

2.5.3 The existing route then continues south-east, following the River Urie, passing through the village of Pitmachie and to the west of Old Rayne. The route then heads in a more southerly direction past Moor of Carden and a westbound lay-by rest area before crossing the Gadie Burn at the junction with the B9002, known as Oyne Fork.

2.5.4 The existing route then turns east running to the south of the River Urie and along the north side of the Aberdeen to Inverness railway line, past lay-bys in each direction and another rest area in the eastbound direction towards Pitcaple.

2.5.5 Through Pitcaple the route is situated between roadside properties and the railway line. A staggered junction at Pitcaple connects the settlements of Whiteford and Durno to the north and Chapel of Garioch to the south.

2.5.6 The existing A96 follows the railway line around the north side of Gallows Hill with Pitcaple Castle to the north and Pitcaple Wood to the south, before crossing over the railway at Inveramsay Bridge. It then heads in a southerly direction towards the C120C Chapel of Garioch junction at Drimmies.

2.5.7 This section of the existing A96 is approximately 16km long.

Speed Limits

2.5.8 The national speed limit applies throughout this section of the existing A96, other than a short distance through the small settlement of Pitmachie where a 50mph speed limit applies for approximately 740m. This is illustrated in Volume 5, Figures 2.8 and 2.9. This lower speed limit is effective from a point approximately 120m north-west of the U61S Oyne Road to a point 860m north-west of the U61S.

Geometric Design Standards

2.5.9 An assessment of the existing design standards has been carried out as outlined in Section 2.3.

Relaxations and Departures

2.5.10 In total, 79 Relaxations and 79 Departures from standard have been identified within this section for 100kph design speed. Most of the departures are related to inadequate SSD and are either individual Departures or combinations of Relaxations encompassing SSD.

Junction Provision

2.5.11 There are 106 private accesses identified on this section. Junctions with public roads included within the Aberdeenshire Council list of roads have been assessed. Refer to Table 2.1 for the list of public roads and Volume 5, Figures 2.3 and 2.4 for locations of these roads.

2.5.12 The location, description and compliance with current design standards of all major / minor priority junctions on this section of the existing A96 are outlined in Table 2.4.

2.5.13 There are no roundabouts on this section.

Table 2.4 Major / Minor Priority Junctions – Existing A96 Colpy to Drimmies

Junction	Compliance to CD 123 Standards				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Corner Radius
C68S Inch – Largie – Colpy Road	✓	✓	✓	x	x
U64S Williamston Road	✓	x	✓	x	x
B992 Inch – Mill of Newton – Culsalmond Road (West)	x	✓	✓	x	✓
B992 Inch – Mill of Newton – Culsalmond Road (East)	✓	x	✓	x	✓
C59S Old Rayne – Lathries – North Rayne Road	x	✓	✓	x	x
U61S Pitmachie – Daies	x	✓	✓	x	x
B9002 Oyne – Kennethmont and Lumsden – Cabrach Road (Oyne Fork)	x	x	✓	x	✓
C120C Mill of Carden – Chapel of Garioch	x	x	✓	x	x
C117C Pitcable – Chapel of Garioch – Blairduff – Kemnay Road	x	x	✓	x	x
C83C Durno Road	x	✓	✓	x	✓
U83C Detrunked section of A96T (Inveramsay)	✓	x	✓	x	✓

Junction	Compliance to CD 123 Standards				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Corner Radius
U81C Harlaw – Hill of Den – Inveramsay Road	x	✓	✓	x	✓

C68S Inch – Largie – Colpy Road Junction

- 2.5.14 This is a ghost island T-junction with right turn lane connecting the C68S which provides access to Colpy to the west of the existing A96. There is a bus stop adjacent to the junction for westbound buses and a bus lay-by opposite the junction for eastbound buses. There is also a field access within the bus lay-by opposite the junction.

U64S Williamston Road Junction

- 2.5.15 This is a simple T-junction connecting the U64S north-east of the existing A96, providing access to Williamston.

B992 Inch – Mill of Newton – Culsalmond Road Junction (West) and B992 Inch – Mill of Newton – Culsalmond Road Junction (East)

- 2.5.16 This is a ghost island staggered T-junction with right turn lanes connecting to the B992 both north-east and south-west of the existing A96. The B992 north-east of the existing A96 provides access to Auchterless. The B992 to the south-west provides access to Inch and Kellockbank Country Emporium and restaurant. There is a residential access on the eastbound side of the existing A96 approximately 40m past the junction.

C59S Old Rayne – Lathries – North Rayne Road Junction (Lawrence Road)

- 2.5.17 Situated to the south of Pitmachie, this is a simple T-junction connecting the C59S north-east of the existing A96, providing access to Old Rayne. There are bus stops (both eastbound and westbound) located approximately 25m west of the junction.

U61S Pitmachie – Daies Junction

- 2.5.18 This is a simple T-junction connecting the U61S south-west of the existing A96, providing access to Daies and Inch. The U61S forks off the junction with the existing A96, with another branch off the U61S providing access to Oyne.

B9002 Oyne – Kennethmont Road Junction (Oyne Fork)

- 2.5.19 This is a splay skew junction connecting the B9002 south-west of the existing A96, providing access to Oyne and to Inch, known as Oyne Fork. An auxiliary lane is provided for westbound A96 traffic wishing to access the B9002.

C120C Chapel of Garioch – Mill of Carden Junction

- 2.5.20 This is a single T-junction connecting the C120C south of the existing A96, providing access to Chapel of Garioch.

C117C Pitcaple – Chapel of Garioch – Blairduff – Kemnay Road and C83C Durno Road Junction

- 2.5.21 This is a staggered T-junction connecting the C117C to the south of the existing A96 and C83C to the north.
- 2.5.22 The C117C provides access to Pitcaple and Chapel of Garioch. There are residential properties fronting the existing A96 at this location. There is a field access directly opposite the junction and a bus stop 30m to the east for westbound buses and one 20m to the west for eastbound buses. The C83C junction provides access to Whiteford and Durno.

U83C Detrunked section of A96T (Inveramsay) Junction

- 2.5.23 This is a ghost island T-junction with right turn lane connecting the U83C south-west of the existing A96, providing access to Inveramsay. There is also a ghost island T-junction 50m south-east of the U83C junction, connecting a field access north-east of the existing A96.

U81C Harlaw – Hill of Den – Inveramsay Road Junction

- 2.5.24 This is a simple T-junction connecting the U81C east of the existing A96, providing access to Harlaw.

2.6 Drimmies to Inverurie Roundabout

- 2.6.1 This section of the existing road network is shown in Volume 5, Figure 2.5.

Existing A96 Route Description

- 2.6.2 This section of the existing A96 is single carriageway and incorporates the 'Inverurie Bypass' constructed in 1991, with the main town directly to the north-east and additional housing developments, a business park and golf course directly to the south-west.
- 2.6.3 The northern-most access from the existing A96 into Inverurie is located immediately east of Drimmies via the C120C. From here, the route heads south-eastwards as it approaches the town and the next junction, Blackhall Roundabout.
- 2.6.4 The existing A96 is bounded by shallow cut slopes and vegetation for approximately 1km west of Blackhall Roundabout. A pedestrian underpass crosses under the existing route immediately to the north-west of the roundabout.
- 2.6.5 Blackhall Roundabout is a major access into Inverurie via the B9144 (previously B9170). Most of the urban area is north-east of the existing A96 including access to Morrisons supermarket and Blackhall Industrial Estate. The junction also provides access to the residential and commercial properties to the south via Blackhall Road (C116C) and to Corsmanhill Drive residential area.
- 2.6.6 Heading south-eastwards from Blackhall Roundabout, Inverurie Golf Club is situated to the south-west of the existing A96 and is accessed via Davah Wood underpass under the route. The route is then in cutting and bounded by residential areas of Davah Wood, Aquhorthies Circle and more areas of housing bounded by Nether Davah Way and Upperboat Road.
- 2.6.7 The road drops in elevation as it heads towards the River Don. The existing A96 passes below Upperboat Overbridge (C116C, St James's Place) north-west of the River Don which is crossed by the River Don Bridge. Approaching Inverurie Roundabout at Port Elphinstone, the existing A96 is bounded by residential areas

to the east, including Riverside Park and residential streets of Kemnay Road. There are also isolated properties to the west.

2.6.8 Inverurie Roundabout marks the change in the existing A96 from a single to dual carriageway.

2.6.9 This section is approximately 5km long.

Speed Limits

2.6.10 The national speed limit of 60mph applies throughout this section which is illustrated in Volume 5, Figure 2.10.

Geometric Design Standards

2.6.11 An assessment of the existing design standards was carried out as outlined in Section 2.3.

Relaxations and Departures

2.6.12 In total, one Relaxation and two Departures from standard have been identified within this section for a 100kph Design Speed. Both departures are related to substandard SSD.

Junction Provision

2.6.13 There are five private accesses identified within this section. Junctions with public roads included within the Aberdeenshire Council list of roads have been assessed for compliance with standards. Refer to Table 2.1 for the list of public roads and Volume 5, Figure 2.5 for the locations of these roads.

2.6.14 The location, description and compliance with current design standards of all major / minor priority junctions and roundabouts on this section of the existing A96 are outlined in Table 2.5 and Table 2.6.

Table 2.5 Major / Minor Priority Junctions – Existing A96 Drimmies to Inverurie Roundabout

Junction	Compliance to CD 123 Standards				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Radius
C120C Inverurie – Drimmies – Chapel of Garioch – Mill of Carden (West)	✓	x	✓	✓	✓
C120C Inverurie – Drimmies – Chapel of Garioch – Mill of Carden (East)	✓	x	✓	✓	✓

C120C Inverurie – Drimmies – Chapel of Garioch – Mill of Carden Junction (West)

2.6.15 This forms the western part of the C120C staggered junction. It is a simple T-junction connecting the C120C west of the existing A96, which provides access to Chapel of Garioch.

C120C Inverurie – Drimmies – Chapel of Garioch – Mill of Carden Junction (East)

2.6.16 This forms the eastern part of the C120C staggered junction. This is a ghost island T-junction with right turn lane connecting the C120C east of the existing A96, providing access to Inverurie from the north. A near side auxiliary lane is provided for eastbound turning traffic.

2.6.17 Both junctions with the C120C connect to an underpass under the existing A96 which provides access to residential and agricultural properties in the vicinity.

Table 2.6 Roundabouts – Existing A96 Drimmies to Inverurie Roundabout

Roundabout	Compliance to CD 116 Standards										
	Entry Width Ratio	Entry Lane Width	Entry Kerb Radius	Entry Path Radius	Flare Length	Exit Width	Exit Kerb Radius	Approach Visibility	Entry Visibility	Visibility to Right	Circulatory Visibility
Blackhall Roundabout	✓	✓	✓	✓	x	x	x	x	✓	✓	✓

Blackhall Roundabout

2.6.18 This is a five-arm at-grade roundabout that links the existing A96 to the B9144 Blackhall Road, C116C and Corsmanhill Drive, providing connections to the centre of Inverurie, Corsmanhill residential development and areas to the south-west of the town. Pedestrian and NMU access across the roundabout is provided via a network of footways and an underpass under the existing A96 situated to the north-west of the roundabout. Davah Wood underpass immediately south-east provides access to Inverurie Golf Club.

Inverurie Roundabout

2.6.19 Inverurie Roundabout is described in Section 2.7

2.7 Inverurie Roundabout to Kintore (Gauchhill Junction)

2.7.1 This section of the existing road network is shown in Volume 5, Figures 2.5 and 2.6.

Existing A96 Route Description

2.7.2 The existing A96 from Inverurie Roundabout to Kintore (Gauchhill Junction) is dual carriageway running in a generally southerly direction with shallow gradients.

- 2.7.3 Inverurie Roundabout at Port Elphinstone forms the most southerly access to / from the existing A96 into Inverurie. It forms the junction with the B993 which leads south-west towards Kemnay and north into Port Elphinstone and Inverurie.
- 2.7.4 Thainstone Roundabout is approximately 1.2km south of Inverurie Roundabout. This section has a bus lay-by in each direction and a shared pedestrian / cycle facility alongside the eastbound carriageway.
- 2.7.5 Thainstone Roundabout serves the Aberdeen and Northern Marts Thainstone Centre, a Business Park and Business Centre and Thainstone House Hotel to the south-west and the former Inverurie Paper Mill to the north-east.
- 2.7.6 From Thainstone Roundabout, the route passes Kintore Business Park before its approach to Tavelty Junction. There are bus lay-bys in each direction adjacent to Kintore Business Park and a shared pedestrian / cycle facility alongside the eastbound carriageway. There are also a small number of individual residential and agricultural properties close to the road. The roundabout has footways on all approaches and pedestrians crossing points of the existing A96 on both eastbound and westbound sides of the roundabout.
- 2.7.7 Tavelty Junction is a full grade-separated junction with the B987 to/from Kintore. The B987 passes below the existing A96 at this location. This junction also provides access to Tom's Forest Quarry to the west.
- 2.7.8 Forest Road overbridge is approximately 500m south of Tavelty Junction and links Kemnay and Kintore via the B994.
- 2.7.9 The existing A96 continues south around the western edge of Kintore passing over Castle Road pedestrian underpass before approaching Gauchhill Junction. There is a segregated lay-by in each direction between Tavelty and Gauchhill junctions north of Castle Road pedestrian underpass.
- 2.7.10 Gauchhill Junction is a limited access grade-separated junction with a diverge slip for eastbound traffic and a merge slip for westbound traffic.
- 2.7.11 This section is approximately 5km long.

Speed Limits

- 2.7.12 The national speed limit applies throughout this section which is illustrated in Volume 5, Figures 2.10 and 2.11.

Geometric Design Standards

- 2.7.13 An assessment of the existing design standards was carried out as outlined in Section 2.3.

Relaxations and Departures

- 2.7.14 In total, there are two Relaxations and 12 Departures from standard identified within this section for a 120kph design speed. Most of the Departures are in relation to substandard SSD.

Junction Provision and Compliance

- 2.7.15 There are four private roads and accesses identified on this section. Junctions with public roads included within the Aberdeenshire Council list of roads have been assessed for compliance with standards. Refer to Table 2.1 for the list of public roads and Volume 5, Figure 2.6 for the locations of these roads.

- 2.7.16 The location, description and compliance with current design standards of all major / minor priority junctions, roundabouts and grade separated junctions on this section of the existing A96 are outlined in Table 2.7, Table 2.8 and Table 2.9.

Table 2.7 Major / Minor Priority Junctions – Existing A96 Inverurie Roundabout to Kintore (Gauchhill Junction)

Junction	Compliance to CD 123 Standards				
	Major SSD	Minor SSD	15m Visibility	9m Visibility	Corner Radius
U113C Tom's Forest Road Junction	✓	✓	✓	x	✓
Kintore Business Park Junction	✓	✓	✓	x	✓

U113C Tom's Forest Road Junction

- 2.7.17 This is a left in / left out junction connecting the U113C Tom's Forest Road to the westbound A96 dual carriageway. It provides access to residences and farms in Clovenstone and Tom's Forest.

Kintore Business Park Junction

- 2.7.18 This is a left in / left out junction with a deceleration lane to the eastbound A96 dual carriageway which provides access to Kintore Business Park, a small residential area and a field access. A shared use segregated cycleway / footway runs parallel to the eastbound carriageway of the existing A96 at this location. A bus lay-by is located approximately 70m prior to the start of the junction deceleration lane.

Table 2.8 Roundabouts – Existing A96 Inverurie Roundabout to Kintore (Gauchhill Junction)

Roundabout	Compliance to CD 116 Standards										
	Entry Width Ratio	Entry Lane Width	Entry Kerb Radius	Entry Path Radius	Flare Length	Exit Width	Exit Kerb Radius	Approach Visibility	Entry Visibility	Visibility to Right	Circulatory Visibility
Inverurie Roundabout	x	✓	✓	x	x	x	✓	x	✓	✓	✓
Thainstone Roundabout	✓	x	✓	x	x	x	x	✓	✓	✓	✓

Inverurie Roundabout

- 2.7.19 This is a four arm at-grade roundabout on the existing A96, linking the existing A96 to the B993 south-west to Kemnay and north to Port Elphinstone and Inverurie via the B993 (Port Elphinstone Road). There are no pedestrian footways or crossings on any of the approaches to the roundabout.

Thainstone Roundabout

- 2.7.20 This is a four arm at-grade roundabout on the existing A96 between Inverurie and Kintore. The western arm serves Thainstone Business Park, Aberdeen and Northern Marts Thainstone Centre and Thainstone House Hotel and the eastern arm provides access to an industrial area. Footways are provided on all arms of the roundabout with a shared use cycleway / footway provided on the eastern side of the roundabout. Uncontrolled pedestrian crossings with dropped kerbs are provided on all the approach islands.

Table 2.9 Grade Separated Junctions – Existing A96 Inverurie Roundabout to Kintore (Gauchhill Junction)

Junction	Compliance to CD 127 Standards				Compliance to CD 122 Standards			
	Lane Width	Nearside Hard strip	Offside Hard strip	Taper	Nose Ratio	Nose Length	Aux Lane Length	Slip Road SSD
Tavelty Junction								
Diverge slip - WB	✓	✗	✗	✗	✓	✓	-	✓
Diverge slip - EB	✓	✗	✗	✗	✓	✗	✗	✗
Merge slip - WB	✓	✗	✗	✗	✓	✗	✗	✗
Merge slip - EB	✓	✗	✗	✗	✓	✗	-	✓
Gauchhill Junction								
Diverge slip - EB	✓	✗	✗	✗	✓	✗	-	✗
Merge slip - WB	✓	✗	✗	✓	✗	✗	-	✓

Tavelty Junction

- 2.7.21 This junction is a full diamond grade separated junction providing access to the north side of Kintore via the B987 and to Tom's Forest Quarry and Kintore cemetery. The junction comprises a dumbbell roundabout layout. Uncontrolled pedestrian crossings with dropped kerbs are provided. A footway follows the southern side of the roundabouts between the B987 and continuing to the cemetery access.

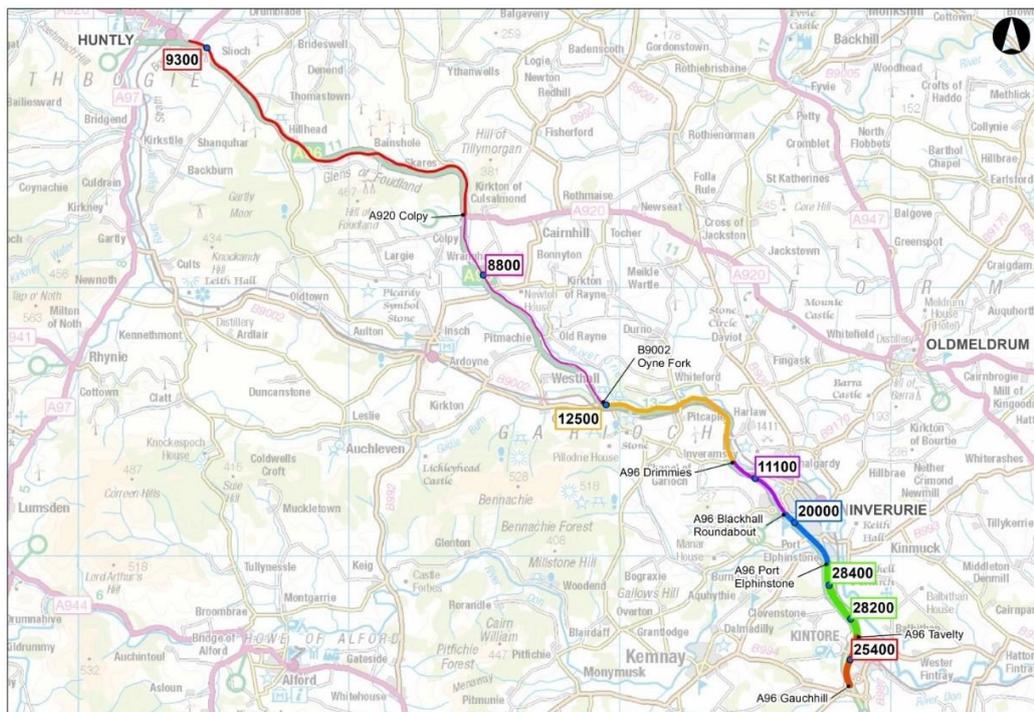
Gauchhill Junction

- 2.7.22 This junction is a half-diamond grade separated junction with west facing slip roads linking to the B977, which provides access to the centre of Kintore to the north-east and Dunecht to the south-west, and onto the B994 which provides access to Kemnay.

2.8 Traffic Conditions

Existing Traffic Patterns

- 2.8.1 Traffic volume data is normally obtained from the latest 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 traffic data collected annually.
- 2.8.2 Automatic Traffic Counters are available along the existing A96 corridor within the scheme extents. Due to prolonged periods of roadworks on the existing A96 in more recent years, the available ATC data were assessed by AmeyArup and not considered reliable. To obtain up to date, more reliable data, temporary traffic surveys were carried out in the Spring and Autumn of 2019 at locations around the existing ATC counter sites. Figure 2.12 outlines the locations of the survey sites and corresponding Annual Average Daily Traffic (AADT) along the existing A96 calculated using link and junction turning counts and historical growth factors.



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Figure 2.12 Annual Average Daily Traffic (2019) on the Existing A96

- 2.8.3 The traffic volume data is summarised in Table 2.10. Two-way AADT volumes on the existing A96 vary along the length of the route, ranging from 9,300 vehicles per day (vpd) at the western end of the scheme near Huntly to 25,400 vpd between Tavelty and Gauchhill Junctions at the eastern end. The lowest traffic flows occur on the section between Colpy (A920) and Oyne Fork (B9002), whilst the highest traffic flows occur on the section between Inverurie and Kintore.

Table 2.10 Annual Average Daily Traffic Flows and Peak Hour Flows on the Existing A96 between Huntly and Kintore (Gauchhill Junction) based on Autumn 2019 survey

Survey Locations	Easting	Northing	AADT (Vehs)	AM Peak hour (Vehs)	PM Peak hour (Vehs)
East of Huntly	354749	838902	9,300	600	890
East of Colpy	364956	830454	8,800	630	770
East of Oyne Fork	369489	825634	12,500	960	1,220
West of Blackhall Roundabout	374992	822898	11,100	890	1,030
Inverurie Bypass Central	376450	821249	20,000	1,730	1,780
East of Inverurie Bypass	377732	818918	28,400	2,320	2,700
West of Kintore Bypass	378517	817671	28,200	2,360	2,710
Tavelty to Gauchhill Junction	378507	816149	25,400	2,370	2,450

Existing A96 Personal Injury Accidents

2.8.4 An analysis of personal injury accident data (PIA) obtained from STATS 19⁴ for a 5-year period, between 1 January 2015 and 31 December 2019 was undertaken on the existing A96 over the scheme extents to assess the current road safety conditions in comparison to national trends. The location and severity of personal accident collisions are shown in Volume 5, Figures 2.13 to 2.15.

2.8.5 Injury accidents can be defined as the following:

- Fatal accidents (shown as red symbols on the PIA figures) are recorded where the level of injuries sustained cause death within 30 days of the accident;
- Serious accidents (shown as blue symbols on the PIA figures) are recorded where the injuries sustained cause death after 30 days of the accident or where the person has been detained in hospital, sustained a fracture, concussion, internal injuries, crushing, severe cuts or lacerations, or severe shock; and
- Slight accidents (shown as green symbols on the PIA figures) are recorded where a person has sustained injuries that are neither fatal nor serious, e.g. sprains, bruising or slight shock requiring roadside attention.

2.8.6 During the period, 50 accidents were recorded resulting in 70 casualties comprising: 32 slight, 16 serious and 2 fatal in severity. A summary of the severity of the accidents is shown in Figure 2.16.

⁴ STATS 19, Reported Road Casualties Scotland, Transport Scotland Statistics road accident reporting form
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/230590/stats19.pdf

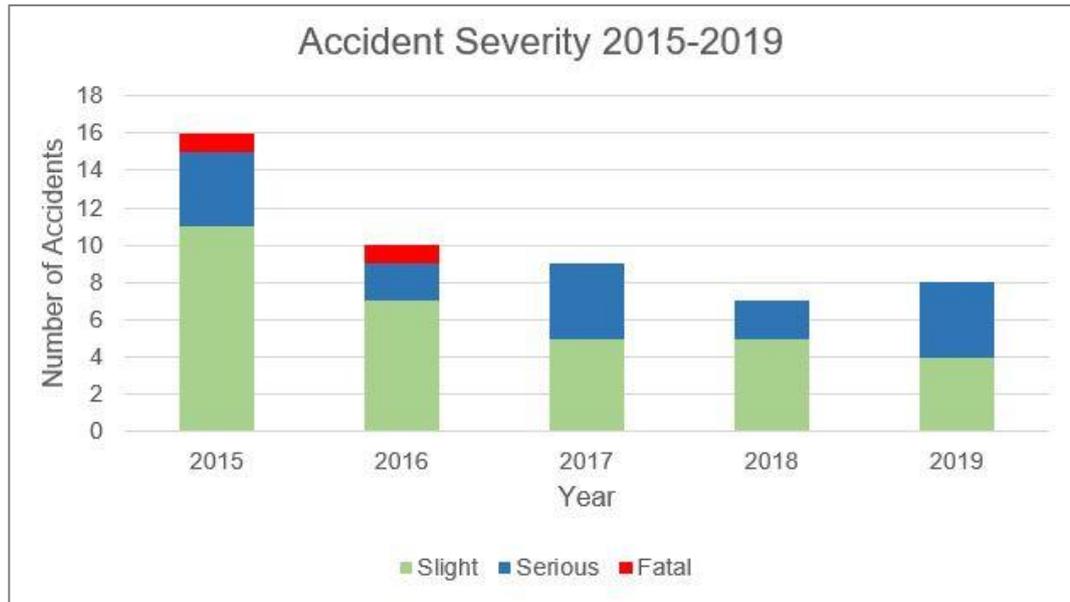


Figure 2.16 East of Huntly to Kintore (Gauchhill Junction) Accident Analysis, 2015 – 2019

2.8.7 Analysis of the data has identified the following key aspects:

- Over a third of the accidents (38%) occurred on the rural section of the A96 between East of Huntly and Colpy, where traffic volumes are lower. The remaining accidents (62%) are spread out along the A96 between Colpy and Kintore (Gauchhill Junction) where traffic volumes are generally higher;
- 48% of accidents were as a result of manoeuvres near junctions, accesses or lay-bys;
- Accidents where a casualty was killed or seriously injured (KSI) can be attributed to the following locations
 - bends (33%);
 - straight sections of road where a bend or junction was not an influence on the accident (33%);
 - junctions (28%); and
 - slip roads (6%).
- 58% of accidents occurred during daylight hours;
- 44% of accidents occurred during wet surface conditions, 14% occurred in snow or icy conditions and the remaining 42% occurred during dry surface conditions;
- 54% of driver casualties involved targeted age groups identified in Transport Scotland's Strategic Road Safety Plan 2016⁵ of which 32% of driver casualties

⁵ Transport Scotland's Strategic Road Safety Plan 2016 available at: <https://www.transport.gov.scot/publication/strategic-road-safety-plan-2016/#:~:text=Strategic%20Road%20Safety%20Plan%202016%20The%20Strategic%20Road,and%20supported%20delivery%20of%20the%20Road%20Safety%20Framework.>

were classed as young drivers - aged between 17-25, and 22% were classed as older drivers – aged 60+;

- Children make up 6% of total casualties;
- 83% of vehicles involved in all accidents were cars, whilst 14% involved goods vehicles, 2% of accidents involved agricultural vehicles and only 1% involved a pedal cycle; and
- 6% of casualties (four no.) were pedestrians, of which two resulted in a fatality and one involved a serious injury. Both fatal accidents recorded in the study area resulted in pedestrian being fatally injured. One of the fatal accidents occurred at the bus stops in the rural Colpy to Oyne section and the other occurred in the dual carriageway section at Kintore.

2.8.8 A cluster analysis has been undertaken on groups of 3 or more accidents occurring within a 100m radius.

2.8.9 Two cluster accident sites have been identified for the 5-year period. This included a cluster of seven accidents at Bainshole located in the Glens of Foudland between Huntly and Colpy. This cluster included three serious accidents, where young driver casualties consisted of 55% of the seven total driver casualties and 71% of accidents occurred while surface conditions were wet / damp. The other location is a cluster of four accidents (slight) located at Blackhall Roundabout.

2.8.10 Accident data has been divided into sections to correspond with changes in road characteristics and / or AADTs. Consequently, the data for East of Inverurie Bypass and West of Kintore Bypass sections have been combined to reflect the similarities in AADT and road character. The following sections have therefore been used in the analysis:

- East of Huntly to Colpy Junction;
- Colpy Junction to Oyne Fork;
- Oyne Fork to Drimmies Junction;
- Drimmies Junction to Blackhall Roundabout;
- Blackhall Roundabout to Inverurie Roundabout ;
- Inverurie Roundabout to Tavelty Junction; and
- Tavelty to Kintore (Gauchhill Junction).

2.8.11 Accident rates expressed as the number of personal injury accidents per 100 million vehicle kilometres (PIA/100MVkm) have been calculated for these sections and compared with current available national average data for 'A' class trunk roads in non-built up areas up to the end of 2018.

2.8.12 Accident rates for the reported injury accidents on the existing A96 are provided in Table 2.11.

Table 2.11 Existing A96 East of Huntly to Kintore (Gauchhill Junction) PIA/100MVkm

Location	Link Length (km)	No. PIA Accidents				PIA/100MVkm		
		Fatal	Serious	Killed or seriously injured (KSI)	All Severities	Fatal	Serious	All Severities
2014-2018 Scottish National Average Accident Rate	-	-	-	-	-	0.47	1.98	9.23
2014-2018 North East Regional Average Accident Rate	-	-	-	-	-	0.3	2.0	6.7
East of Huntly to Colpy Junction	13.8	0	6	6	19	0.00	2.56	8.11
Colpy Junction to Oyne Fork	9.2	1	3	4	9	0.68	2.03	6.09
Oyne Fork to Drimmies Junction	7.0	0	3	3	9	0.00	1.88	5.64
Drimmies Junction to Blackhall Roundabout	2.6	0	0	0	0	0.00	0.00	0.00
Blackhall Roundabout to Inverurie Roundabout	2.5	0	2	2	7	0.00	2.19	7.67
Inverurie Roundabout to Tavelty Junction	3.4	1	1	2	4	0.57	0.57	2.27
Tavelty to Gauchhill Junction	5.0	0	1	1	2	0.00	1.44	2.88
Total	43.5	2	16	18	50	0.21	1.72	5.37

2.8.13 Key findings of the analysis on the accident data has indicated the following:

- Fatal accidents in the Colpy Junction to Oyne Fork and Inverurie Roundabout to Tavelty Junction sections are higher than both the national and regional average with accident rates of 0.68 PIA/100MVkm and 0.57 PIA/100MVkm respectively. These figures are however skewed by a single fatal accident together with the relatively low traffic flows in the Colpy Junction to Oyne Fork section and the relatively short section length in the Inverurie Roundabout to Tavelty Junction section;
- Serious accidents in the sections between East of Huntly and Colpy Junction, Colpy Junction and Oyne Fork, and Blackhall Roundabout and Inverurie Roundabout are higher than the national average with accident rates of 2.56 PIA/100MVkm, 2.03 PIA/100MVkm and 2.19 PIA/100MVkm respectively;

- All severity accidents in all sections are below the national average of 9.23 PIA/100MVkm. For the sections between East of Huntly and Colpy Junction, and Blackhall Roundabout to Inverurie Roundabout, the accident rates are also higher than the North East regional average of 6.7 PIA/100MVkm with all severity accident rates of 8.11 PIA/100MVkm and 7.67 PIA/100MVkm respectively;
- The average of KSI collisions in this corridor is 36% over the five-year period. This is almost 1.8 times higher than the 2014-2018 national average of 20% KSI collisions. Although the total number of collisions is on a downward trend (see Figure 2.16), the number of KSIs remains constant;
- The majority of accidents (88%) involved one or two vehicles which is typical for rural roads with low AADT as per Transport Scotland statistics. However, this analysis shows that single vehicle collisions are more severe;
- The East of Huntly to Colpy section has the highest accident rate and total number of accidents of all the sections analysed despite having the lowest AADT; and
- The number of accidents (all severity) on the dualled section between Inverurie Roundabout and Kintore (Gauchhill Junction) is considerably lower than all sections to the west despite having a significantly greater AADT.

Winter Resilience

- 2.8.14 The A96 Dualling Scheme Resilience Strategy⁶ records the following Areas Requiring Special Attention:
- Glens of Foudland (Snow)
 - Skares to Bainshole (Water run off)
 - Inverurie Bypass (Frost susceptible area)
- 2.8.15 The Glens of Foudland is reported to be at risk of snow drift due to elevation and lack of shelter. A specific Winter Service Plan is currently in place for this stretch of the existing A96 and BEAR Scotland (the network operator on behalf of Transport Scotland in the north-east region) are responsible for implementation. This plan forms part of the Scottish Ministers' wider contingency arrangements to deal effectively with all winter weather conditions which can be expected to arise and describes the processes, procedures and operational arrangements for those responsible for delivering winter services.
- 2.8.16 There are currently no physical snow gates on the existing A96 however virtual snow gates were installed in 2012/13. These are signs with flashing lights located east of Huntly and north of the A920 junction near Kirkton of Culsalmond. The signs provide drivers with rapid notification of a closure of the route. There are snow-poles alongside the road from north of the A920 junction to the top of the overtaking lanes at Hillhead.

⁶ A96 Dualling Scheme Resilience Strategy, Revision 3, May 2015, prepared by Jacobs UK Ltd on behalf of Transport Scotland

- 2.8.17 Six snow closures were recorded on the existing A96 in a six-and-a-half-year period (2011 – 2018) by Traffic Scotland and BEAR Scotland. No data is available prior to 2011. All the closures were recorded in the Glens of Foudland area.
- 2.8.18 Most recorded closures on this section were related to accidents rather than snow. Under the 4th Generation Term Contract for Management and Maintenance of the Scottish Trunk Road Network, BEAR is only required to record winter related road closures for winter closures of over four hours in duration. BEAR noted there have been road closures where there have been accidents and the road has been closed for anywhere from a few minutes up to over 3 hours, but these have not been specifically recorded as they were below the four-hour threshold.
- 2.8.19 Accidents on the existing A96 through Glens of Foudland are above national average for 'Serious' accidents and poor weather may play some part in this trend. Two-thirds of the accidents in this area were however not attributed to snow and ice, with most accidents being associated with overtaking and loss of control on bends.
- 2.8.20 The section between Skares and Bainshole which has been identified as being at risk of water run off sits adjacent to and below the slopes of the Hill of Skares and Hill of Bainshole.

2.9 Road Pavement Condition

- 2.9.1 The Integrated Road Information System (IRIS), a database used by Transport Scotland to record and predict the condition of trunk roads in Scotland, was used to provide information on the existing A96 pavement thickness and condition within the study area.

Pavement Layer Thickness

- 2.9.2 Using the layer construction information provided from the IRIS database, the existing pavement is a fully flexible pavement with bituminous layers.
- 2.9.3 The range and average thickness of the bituminous layers reported for each of the geographical sections is shown in Table 2.12.

Table 2.12 Existing A96 Pavement Thickness

Geographical Section	Thickness Range (mm)	Average Thickness (mm)
East of Huntly to Colpy	170-250	210
Colpy to Drimmies	170-300	220
Drimmies to Inverurie Roundabout	220-320	250
Inverurie Roundabout to Kintore (Gauchhill Junction)	260-310	280

Pavement Residual Life

- 2.9.4 IRIS also contains information on deflectograph surveys that give an indication of the strength of the road pavement layers. One-fifth of the network is surveyed annually, giving full network coverage every five years and provides estimates of the remaining useful life of the road.

2.9.5 A summary of the residual pavement life for the existing A96 is shown in Table 2.13.

Table 2.13 Existing A96 Pavement Residual Life

Residual Life (Years)	% Length of Road	Length of Road (km)
<5	13	5.38
5 to 9	6	2.34
10 to 14	6	2.81
15 to 19	7	2.73
>19	68	28.16

2.9.6 A total of 75% of the existing A96 within the study area has an estimated residual life of at least 15 years but 13% has an estimated residual life of less than five years.

2.9.7 Further pavement investigation would be required to verify the information provided by the IRIS database and to provide a more comprehensive understanding of the existing pavement condition.

2.10 Structures

2.10.1 There are 32 structures along the East of Huntly to Kintore (Gauchhill Junction) section of the existing A96 including:

- 19 bridges including underpasses;
- Seven culverts;
- Four retaining walls; and
- One Variable Message Sign (VMS) concrete plinth.

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

Bridges

2.10.3 Information on existing bridges was gathered by visual inspections and from previous Principal Inspection reports. A summary of existing bridges is provided in Appendix A2.1-A2.3 (Volume 4). Each bridge on the trunk road network is allocated a structure reference number by Transport Scotland e.g. A96 150. The principal structures of interest are described below. For this review a structure is considered to be of interest if it includes particularly large spans (i.e. greater than 150m in length), an unusual form of construction or if a previous inspection identified high maintenance priority items. The locations of these structures are identified in Volume 5, Figures 2.7 to 2.11.

Carden Bridge (A96 230)

2.10.4 Carden Bridge (A96 230) is located approximately 3km west of Pitcaple and carries the existing A96 over the Gadie Burn at the junction with the B9002. It was constructed circa 1900 and widened circa 1936.

- 2.10.5 The original structure consists of two span random rubble masonry arches with random rubble spandrels. The abutments and central pier comprise random rubble masonry with an unknown foundation detail. The widened structure comprises mass concrete arches on concrete supports. The deck is trapezoidal in plan with two spans of 5.4m.
- 2.10.6 The latest Principal Inspection report, issued in 2017 by BEAR Scotland, states the structure is in poor condition and it is currently being monitored in accordance with DMRB CS 470 (Management of sub-standard highway structures). There are several maintenance work items identified in the report as being required including masonry repairs and repointing, concrete repairs, replacement of deck waterproofing, scour protection at the central pier and repair of the deck drainage system. These components are identified for repair or replacement within the current maintenance programme.
- 2.10.7 The structure cross section does not meet current standards required for a rural single carriageway in accordance with DMRB CD 127 Cross-sections and headrooms. The width between kerbs is approximately 6.3m compared to a requirement of 9.3m. The overall width of the bridge is 8.6m compared to a requirement of 10.5m.
- 2.10.8 The masonry parapets are 0.75m high on the west side of the structure and 0.9m high on the east. The containment level is not recorded. A temporary barrier runs along the full length of the westbound side parapet.

Upperboat Overbridge (A96 160)

- 2.10.9 Upperboat Overbridge (A96 160) is located to the south-west of Inverurie and carries St James's Place Road over the existing A96. It was constructed circa 1990 and consists of a three-span continuous deck of rolled steel beams acting compositely with a reinforced concrete deck slab.
- 2.10.10 The substructure comprises reinforced concrete solid walled piers and skeletal abutments, both with spread footing foundations. The structure has a skew of 29 degrees, square side spans of 11m and 8.9m and a square central span of 12.3m.
- 2.10.11 The most recent Principal Inspection report, issued in 2017 by BEAR Scotland, identifies several defects including localised spalling of the concrete pier diaphragm beams, impact damage on the primary steel beams and severely corroded containment barriers protecting the intermediate supports.
- 2.10.12 The structure cross-section meet current standards required for a urban single carriageway in accordance with DMRB CD 127 Cross-sections and headrooms.
- 2.10.13 The minimum headroom meets current standards required for overbridges as per DMRB CD 127 Cross-sections and headrooms. The minimum headroom is 5.355m compared to a requirement of 5.03m (not including the sag curve allowance). It does not however meet the minimum required maintained height for a high load route which is 6.18m (not including sag curve allowance).
- 2.10.14 The parapets are 1.0m high and comprise vertical metal posts and three horizontal rails with mesh infill. Records identify that the parapets provide N2 level containment. The stated height of containment meets minimum current standards required for road bridges as per DMRB CD 377 Requirements for road restraint systems.

River Don Crossing (Don Inverurie New (A96 150))

- 2.10.15 Don Inverurie New (A96 150), known as the River Don Crossing, is located southwest of Inverurie and carries the existing A96 over the River Don. It was constructed circa 1990 and consists of four continuous deck spans comprising steel plate girders acting compositely with a reinforced concrete slab.
- 2.10.16 The substructure consists of reinforced concrete piers and skeletal abutments. The structure crosses the river on a square alignment and has spans of 25m, 42.5m, 42.5m and 30m.
- 2.10.17 The most recent Principal Inspection report, issued in 2017 by BEAR Scotland, states that the structure is generally in good condition. Maintenance works items include blocked drainage outlets and tracking of the movement joints. These elements are identified for repair or replacement within the current maintenance programme.
- 2.10.18 The structure cross-section is compliant with current standards required for a rural single carriageway in accordance with DMRB CD 127 Cross-sections and headrooms. The width between kerbs is approximately 9.3m, which matches the requirement of 9.3m. The overall width of the bridge is 11.3m compared to a requirement of 10.5m.
- 2.10.19 The parapets are 1.0m high and comprise vertical metal posts and three horizontal rails with mesh infill. Records identify that the parapets provide N2 level containment. The stated height of containment meets minimum current standards required for road bridges as per DMRB CD 377 Requirements for road restraint systems.

Culverts

- 2.10.20 There are seven culverts located on this section of the existing A96. A summary of these culverts is provided in Appendix A2.1-A2.3 (Volume 4).
- 2.10.21 Inspection reports identify that minor maintenance items are required including provision of pedestrian fencing and masonry repointing.

Retaining Walls

- 2.10.22 There are three recorded retaining walls within the study area on this section of the existing A96. A summary of these retaining walls is provided in Appendix A2.1-A2.3 (Volume 4). A fourth retaining wall is located on the south side of the existing A96 opposite the entrance to Pitcaple Castle lodge, however this wall does not have any unique identifier or inspection record.
- 2.10.23 No maintenance priority items have been identified in Principal Inspection reports issued by Bear Scotland. No inspection reports are available for structures A96 60 W31 or A96 60 W15.

VMS Plinth

- 2.10.24 There is one VMS structure located on this section of the existing A96 to the west of Inverurie. This is a verge mounted sign founded on a 1m square concrete plinth, located behind a steel safety barrier. A summary of this structure is provided in Appendix A2.1-A2.3 (Volume 4).

2.11 Roadside Features

Lay-bys

- 2.11.1 There are a total of 25 lay-bys on the existing A96 between East of Huntly and Kintore (Gauchhill Junction). Of these, 14 are on the westbound side and 11 on the eastbound side. The location, category and carriageway direction of the lay-bys is detailed in Table 2.14 and illustrated in Volume 5, Figures 2.7 to 2.11.
- 2.11.2 The lay-by type, Type A or Type B, is as defined in DMRB CD 169 The design of lay-bys, maintenance hardstandings, rest areas, service areas and observation platforms.

Table 2.14 Lay-bys – Existing A96

Approximate Location (see note)	Lay-by Type	Direction
505m east of C81S	Type A	Westbound
865m west of C66S	Type A	Eastbound
400m west of C66S	Type A	Westbound
550m west of U70S	Type A	Westbound
1080m east of U70S	Type B	Westbound
390m west of C87S	Type A	Eastbound
720m west of A920 (Morgan McVeigh's)	Type A	Westbound
Opposite C68S at Colpy	Bus Lay-by	Eastbound
375m west of C59S	Type B Slow vehicle	Westbound
650m west of B9002	Type A	Westbound
470m east of B9002 Woods of Logie	Type A	Eastbound
1170m east of B9002	Type A	Westbound
1515m east of B9002	Type A	Eastbound
650m east of C120C (Drimmies Farm)	Type A	Westbound
740m east of C120C (Drimmies Farm)	Type A	Eastbound
620m east of Blackhall Roundabout	Type A	Westbound
720m east of Blackhall Roundabout	Type A	Eastbound
355m east of Inverurie Roundabout	Bus Lay-by	Eastbound
450m east of Inverurie Roundabout	Bus Lay-by	Westbound

Approximate Location (see note)	Lay-by Type	Direction
65m east of Thainstone Roundabout	Bus Lay-by	Eastbound
140m east of Thainstone Roundabout	Bus Lay-by	Westbound
290m west of Kintore Business Park	Bus Lay-by	Eastbound
170m west of Kintore Business Park	Bus Lay-by	Westbound
320m east of the Forest Road Overbridge, Kintore	Type A	Eastbound
670m east of the Forest Road Overbridge, Kintore	Type A	Westbound

Note: Distances are measured from centre of local road to entry point of lay-by

Rest Areas

- 2.11.3 DMRB CD 169 defines an all-purpose trunk road rest area as an off-carriageway stopping provision that includes parking and can include tourist information, toilets, public telephone, picnic area, disabled facilities and / or viewpoints.
- 2.11.4 Signed rest areas are provided at four locations along the existing A96 as detailed in Table 2.15 and Volume 5, Figures 2.7 to 2.11.

Table 2.15 Rest Areas – Existing A96

Location	Direction	Comments
865m west of C66S	Eastbound	Shared access with lay-by (Type A with merge taper). Picnic benches and hardstanding area
720m west of A920	Accessible from either direction	Located at Morgan McVeighs restaurant. Parking only, no other facilities
650m west of B9002 junction	Westbound	Picnic benches only
470m east of B9002 junction	Eastbound	Woods of Logie, information, picnic benches and emergency telephone

- 2.11.5 Additionally, the existing A96 bypasses several larger settlements such as Inverurie and Kintore where public welfare facilities and overnight car parking is present.
- 2.11.6 There are no formal parking facilities or rest areas for Heavy Goods Vehicles (HGVs) on this section of the existing A96. HGVs have however been observed parking overnight in industrial areas at Blackhall and Highclere Business Park in Inverurie as identified in the North East Scotland Lorry Parking Study⁷. The nearest formal lorry parks to this section of the existing A96 are at Ashgrove services four miles west of Huntly on the existing A96 and at Altens in Aberdeen.

⁷ North East Scotland Lorry Parking Study, North East Scotland Freight Forum, AECOM, March 2011

Lighting

- 2.11.7 Road lighting is provided in the verge of the existing A96 at various locations between East of Huntly and Kintore (Gauchhill Junction). Table 2.16 describes the locations of the existing lighting and these are illustrated in Volume 5, Figures 2.7 to 2.11.

Table 2.16 Lighting – Existing A96

Location	Start (approx.)	End (approx.)
Pitmachie	For a length of 400m through the village	
Pitcaple	For a length of 300m through the village	
Blackhall Roundabout	70m west of the roundabout	70m east of the roundabout
Through Inverurie and Thainstone Roundabouts	300m west of Inverurie roundabout	200m east of Thainstone roundabout

Vehicle Restraint System

- 2.11.8 A vehicle restraint system (VRS), or safety barrier, is provided at various locations along the existing A96 between East of Huntly and Kintore (Gauchhill Junction). As described in DMRB CD 377 Requirements for road restraint systems the objective of a safety barrier is to reduce the consequences of vehicles leaving the carriageway and entering areas where hazards exist. Table 2.17 lists the approximate locations of the VRS, its length and the hazard.

Table 2.17 Vehicle Restraint Systems – Existing A96

Barrier Location	Verge	Length (m)	Hazard
300m east of the C81S junction	Eastbound	200	Embankment
630m east of the U82S junction	Eastbound	200	Embankment
930m east of U82S junction	Eastbound	430	Embankment
1000m east of U82S junction	Westbound	320	Embankment
700m west of C82S junction	Eastbound	250	Embankment
40m west of C82S junction	Westbound	320	Buildings
1380m east of C82S junction	Eastbound	230	Embankment
2120m east of C82S junction	Westbound	730	Embankment
160m west of U70S junction	Eastbound	60	Bridge
460m east of U70S junction	Eastbound	540	Embankment
Skares	Eastbound	130	Culvert
100m east of Skares	Eastbound	460	Embankment
380m west of C87S junction	Eastbound	140	Embankment
220m west of C87S junction	Eastbound	220	Embankment
180m east of C87S junction	Eastbound	100	Embankment
900m east of C87S junction	Eastbound	260	Embankment

Barrier Location	Verge	Length (m)	Hazard
220m west of A920 junction	Eastbound	60	Road sign
450m east of A920 junction	Both	200	Embankment
560m west of B992 junction	Eastbound	280	Embankment
At the B992 junction	Eastbound	130	Embankment
At the B992 junction	Westbound	70	Access road
800m west of C59S junction	Eastbound	60	Buildings
Bridge over Shevock Burn	Both	100	Watercourse
50m west of B9002 junction	Eastbound	160	Embankment
Bridge over the Gadie Burn (temp barrier)	Westbound	120	Bridge over watercourse
580m east of B9002 junction	Eastbound	150	Embankment
1050m east of B9002 junction	Eastbound	420	Embankment
100m west of the C117C junction	Westbound	340	Railway line
710m East of C83C junction	Eastbound	740	Embankment
1000m west of U81C junction	Eastbound	90	Culvert
780m west of U81C junction	Westbound	260	Culvert and SuDS pond
West of Inveramsay Bridge	Eastbound	280	Embankment
West of Inveramsay Bridge	Westbound	65	Embankment and railway
Inveramsay Bridge	Westbound	130	Railway bridge
Inveramsay Bridge	Eastbound	100	Railway bridge
East of Inveramsay bridge	Eastbound	40	Embankment
East of Inveramsay bridge	Westbound	165	Embankment
West of U81C junction	Eastbound	30	Embankment
East of U81C junction	Eastbound	75	Embankment
470m west of C120C junction at Drimmies	Both	80	Embankment and underpass
310m west of C120C junction at Drimmies	Eastbound	410	Embankment
West of the C120C junction at Drimmies	Westbound	300	Embankment
East of the C120C junction at Drimmies	Eastbound	90	Embankment
1200m east of C120C junction at Drimmies	Both	70	Embankment and Underpass
1100m west of the Blackhall Roundabout	Westbound	60	VMS
800m west of the Blackhall Roundabout	Eastbound	50	Road sign

Barrier Location	Verge	Length (m)	Hazard
230m west of the Blackhall Roundabout	Eastbound	50	Road sign
Western approach to Blackhall Roundabout	Both	90	Pedestrian underpass
East of Blackhall Roundabout	Both	70	Underpass
110m east of Blackhall Roundabout	Westbound	40	Road sign
St. James' Place overbridge	Both	150	Bridge
River Don Crossing	Both	175	River Don
East of River Don Crossing	Eastbound	160	Embankment
East of River Don Crossing	Westbound	100	Embankment
Inverurie Roundabout to Thainstone Roundabout (Central Reserve)	Both	1100	Dual carriageway
200m east of Thainstone Roundabout	Westbound	70	Road sign
340m east of Thainstone Roundabout	Eastbound	200	Buildings
300m west of Kintore Business Park	Eastbound	50	Road sign
East from Thainstone Roundabout (Central Reserve)	Both	650	Dual carriageway
Opposite Kintore Business Park	Westbound	150	Buildings
Merge slip at Tavelty Junction	Westbound	100	Wall
Approach to Tavelty Junction	Eastbound	270	Interchange
Diverge slip at Tavelty Junction	Eastbound	90	Embankment
Diverge slip at Tavelty Junction	Eastbound	190	Embankment
Diverge slip at Tavelty Junction	Westbound	170	Embankment
Departure from Tavelty Junction	Eastbound	200	Interchange
Tavelty Junction overbridge	Both	40	Interchange
Merge slip at Tavelty Junction and Forest Road bridge	Eastbound	520	Embankment and Bridge
650m east of Thainstone Roundabout (Central Reserve) to Gauchhill Junction	Central reserve	3000	Dual carriageway
Forest Road overbridge	Both	80	Bridge
West of the B977 junction	Eastbound	50	Road sign
470m east of the Forest Road bridge	Westbound	100	Road sign
Castle Road underpass	Eastbound	250	Embankment
Castle Road underpass	Westbound	330	Embankment

Barrier Location	Verge	Length (m)	Hazard
Diverge slip at Gauchhill Junction	Eastbound	240	Embankment
Merge slip at Gauchhill Junction	Westbound	230	Embankment
Gauchhill Junction overbridge	Both	100	Dual carriageway

Signage

- 2.11.9 All signage along this section of the existing A96 is written in English only. There is one VMS located for westbound traffic immediately to the west of Inverurie.
- 2.11.10 Virtual snow gates have been erected east of Huntly and north of the A920 junction near Kirkton of Culsalmond. These are described in Paragraph 2.8.16.
- 2.11.11 A more detailed assessment of existing signage provision will be undertaken during DMRB Stage 3.

2.12 Non-Motorised User Provision

- 2.12.1 In the existing A96 corridor, the NMU route network comprises a mix of on and off-road routes. The NMU routes are a mix of terrain types from paved to grassy paths and cater for a wide variety of non-motorised users (NMUs) including pedestrians, cyclists, equestrians and vulnerable groups. Further baseline information in the study area is contained in Volume 2, Part 3, Chapter 12 People and Communities.
- 2.12.2 Strategic NMU routes include Core Paths, Aspirational Core Paths, Public Rights of Way, Scotland's Great Trails and the National Cycle Network. Existing Local Routes are routes which have no designation but have been identified through existing data obtained from the DMRB assessment work, site visits and consultation as being important NMU links. The following route 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 National Heritage.
 - Core Paths - under the Land Reform Act of 2003, every Council in Scotland is required to develop a plan for a network of Core Paths. The Aberdeenshire Core Paths Plan identifies a network of Core Paths for the purpose of giving the public reasonable access throughout the Aberdeenshire area. The plan was developed using information gathered from various sources about where people enjoy walking, cycling, horse riding and other outdoor activities. The research indicates where new routes and improvements might be needed, while the plan assists landowners and land managers with managing public access to their property. Core Paths can include PRoW, footways, cycleways, tracks, waterways and any other means a person may cross the land.
 - Aspirational Core Paths – NMU routes with no statutory designation, unlike Core Paths and PRoW but are recognised as being frequently used, facilitating active travel and sustainable transport.
 - National Forest Recreation Routes – routes or trails in 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.

Footpaths and Footways

2.12.3 The footpaths and footways which are in the vicinity of the existing A96 between Huntly and Kintore (Gauchhill Junction) are shown in Volume 5, Figures 2.17 to 2.19. Public Rights of Way, Core Paths and aspirational core paths (or sections of aspirational core paths) are described in Table 2.18.

Table 2.18 Public Rights of Way, Core Paths and Aspirational Core Paths- Existing A96

Path Ref.	Location	Description
607.01	Huntly	Battlehill
607.02	Huntly	Aberdeen Road to Kinnoir Wood
607.03	Huntly	Portsoy Road Footway / Meadows Paths riverside
607.04	Huntly	Cleanbrae Bin Forest Link
607.05	Huntly	Portsoy Road Link (Castle Road-Gibston Bridge)
407.01	Insch	The Drumrossie Path is located on the eastern edge of the village and provides a link to Drumrossie House.
407.02	Insch	Hill of Christ's Kirk Circular / Beatrice Woodland Path
407.04 / L10R	Insch	Dunnydeer Farm Circular / Insch Cemetery Footway, which lies to the northwest of Insch. Part of the route is on road.
407.05	Insch	Insch – Kirkton
416.01	Oyne	Oyne Woodlands Path, which is located to the north of the B9002 and southwest of the existing A96 and follows a route near to the Gadie Burn.
416.02 / L4R / L5R	Oyne	Oyne Circular, which lies to the southwest of Oyne and starts and ends at the B9002. Includes on road sections L4R and L5R.
416.03 / 7LD.04	Oyne / Bennachie	Old A'Deen Turnpike Back O' Bennachie – Essons / Gordon Way (West – Suie Section) & (East – Bennachie Section)
415.01	Old Rayne	Burnside Path which lies on the west side of Old Rayne. It commences at Lawrence Road and follows a route near to the Bonnyton Burn.
L3R	Old Rayne	Old Rayne Village link to Jenny's Trees via Urie Riverside path (ref 415.02) is on road.
415.02	East of Old Rayne	Jenny's Trees via Urie Riverside path is located to the east of Old Rayne and provides a link between path L3R and 404.02.

Path Ref.	Location	Description
404.01	Logie Durno	The Logie Woods to Durno path commences at its intersection with the Whiteford to Old Rayne path (404.2) and is located to the southwest of Durno. Includes aspirational link to Durno village.
404.02 / L6R	Logie Durno	This is a route linking the village of Old Rayne (Logie Road) to Whiteford and follows a route approximately parallel to the existing A96 on the north side.
GG52	Pitcaple	Public Right of Way leading south from Mill of Pitcaple to the existing A96, east of Pitcaple Castle.
412.01	Meikle Wartle	Warhill House Circular, this path is located to the north of Meikle Wartle. Includes aspirational section for circular route.
L7R / L11R	Meikle Wartle	Warhill to Meikle Wartle Road Link
304.01	Daviot	This path runs from Daviot Village west to the House of Daviot.
304.02 / L9R	Daviot	Daviot Village to Loanhead Stone Circle. Most of the route is on road.
GG53	Daviot	Public Right of Way west of Hillhead Lethenty to the B9001.
309.02	Oldmeldrum	Oldmeldrum: Village to Barra Hill and Kirkton of Bourtie
309.03	Oldmeldrum	Blankets Track
309.04	Oldmeldrum	Oldmeldrum: Village link to Lochter – aspirational link
309.05	Oldmeldrum	Oldmeldrum: Roadside Cycle Path
406.01	Hatton of Fintray	Hill of Hatton circular
408.01	Port Elphinstone	Port Elphinstone Riverside path, which comprises the footway on Riverside Park (Davidson Field) and in part lies alongside the River Don.
408.02	Port Elphinstone	Bass Riverside, which is a route adjacent to the B993 and the River Don through Port Elphinstone
GG55	Port Elphinstone	Public Right of Way leading west from Old Kemnay Road, running parallel to the River Don towards Woodend Burn.
Unreferenced	Port Elphinstone	Public Right of Way unrecorded path passing from the B993 to Kemnay Road, Inverurie.
408.03	Keith Hall	Keith Hall Network, which is located to the east of Inverurie and runs north from the B993.
408.04 / 408.04R	Inverurie	Inverurie to East Aquhorthies – provides a link to the Stone Circle located to the west of the town. Includes section on road.

Path Ref.	Location	Description
408.05 / 408.05P	South of Inverurie	Old Kemnay Road (Kemnay – Inverurie), includes aspirational section via Haughton
408.06	Inverurie / Kintore	Inverurie to Kintore shared use path which follows the route of the existing A96 over most of its length.
408.07	Inverurie	This path follows a route through the residential area to Dillyhill which is located to the northwest of the Blackhall Roundabout.
408.08	Port Elphinstone	Druidsfield Circular (South Heritage Walk), which is located to the southeast of Port Elphinstone, part of the path lies adjacent to the Old Canal. The path starts at Railway Terrace in the north and ends at Mill Road in the south.
408.09	Inverurie	Souterford Road to The Bass, which lies on the east side of Inverurie and follows the alignment of Old Port Road, Souterford Road and the B9170 (Oldmeldrum Road).
408.10	Inverurie	Uryside Circular – Proposed Link
408.11	Inverurie	Howford Bridge Link Meldrum Meg Way – Proposed Link
408.12	Inverurie	Davah Hill Loop, which is located to the west of the existing A96 and north of Inverurie Golf Course. The route commences in the east at Blackhall Roundabout.
409.04	South of Inverurie	Cairnton Wood Link
410.01	Inverurie Roundabout to Gauchhill Junction	Castle Farm to Gauchhill Plantation is a route that links the B987 in the east with the B994 in the west. The path crosses the existing A96 via an underpass.
410.02	Kintore	This path is located on the east side of Kintore and provides a link to Tuach Hill.
410.03	Kintore	Lammies Crook / Dalwarie / Deystone Circular, which is located east of Kintore following a route alongside the River Don. Includes section of aspirational path.
410.04	Kintore	Gauchhill Woodland Circular, which starts and ends at the B977 Gauchhill Road on the north side of the existing A96. Includes section of aspirational path.
410.05	Kintore	Gauchhill Circular, which is an on-road path which follows the route of the B977. It commences in the north at the roundabout with Hallforest Avenue and ends at the roundabout with the B994 in the south. Includes section of aspirational path.
402.02	Kinellar	Carmmhor Circular / Carmmhor Circular Road Link

Path Ref.	Location	Description
402.03	Kintore	The Skair: Blackburn to Kintore

- 2.12.4 Footway provision alongside the existing A96 exists through the settlements of Pitmachie (east side only) and Pitcaple (both sides).
- 2.12.5 There is a shared use pedestrian and cycle path, designated as Core Path 408.06, that commences to the south of Inverurie Roundabout on the eastbound side of the existing A96. The path then continues to Thainstone Roundabout and to Kintore Business Park then onto Tavelty Junction where it follows an alignment alongside the eastbound diverge slip road towards Kintore.
- 2.12.6 There are also some short localised sections of footway on the existing A96 provided as a hardstanding and / or to access the bus stops for residents who live either side of the trunk road.

Cycle Paths

- 2.12.7 The relevant Aberdeenshire Council cycle routes are described in Table 2.19. These routes are mainly located on B, C and unclassified roads in the vicinity of the existing A96. The only section of cycle path that follows the existing A96 has been described in Paragraph 2.12.5.

Table 2.19 Cycle Routes - Existing A96

Cycle Route Name	Description
Insch to Oyne– Route GA1	This 19-mile circular route links the villages of Insch and Oyne.
Great Inverurie Bike Ride - Route GA2	Starting in Inverurie, this 25-mile route crosses the existing A96 on an overbridge (St James's Place) to the south of Inverurie. The route then loops around Burnhervie, Kemnay, Pitfichie, Chapel of Garioch and back to Inverurie.
Oldmeldrum to Old Rayne – Route GA3	This is an on-road 26-mile circular route linking the two villages of Old Rayne and Oldmeldrum.
Inverurie to Kintore	This is a shared use path adjacent to the existing A96 and is designated as Core Path 408.06.

2.13 Drainage

- 2.13.1 Road drainage systems for collecting surface water run-off vary along different sections of the existing A96. The section from East of Huntly to Kintore (Gauchhill Junction) can loosely be split into two distinct sub-sections: East of Huntly to Inveramsay, where the drainage is largely allowed to run 'over the edge' to adjacent land and Inveramsay to Kintore (Gauchhill Junction), where the run-off is generally collected by road side filter drains. There are however exceptions to these conditions within both sub-sections.
- 2.13.2 Throughout the area, junctions are generally kerbed with run-off collected by gullies. Likewise, lay-bys and bus stops are also generally served by kerbs and gullies.
- 2.13.3 Areas served by a positive drainage system generally connect to a local carrier drain network and discharge to the nearest watercourse. The drainage associated

with the newer section of the existing A96 around Inveramsay is attenuated through two Sustainable Drainage Systems (SuDS) basins, installed as part of the upgrade works in 2016.

- 2.13.4 There are no other SuDS locations within the wider scheme extents and surface water is likely discharged to the water environment without secondary treatment or attenuation.

2.14 Public Utilities

- 2.14.1 Public utilities have been identified and key utilities are shown in Volume 5, Figures 2.20 to 2.24.

Telecommunications

- 2.14.2 Underground BT Openreach cables run adjacent to the existing A96 between East of Huntly and Pitcaple. Between Pitcaple and Inverurie BT underground cables follow the previous A96 alignment at Inveramsay (now the U83C) before joining the Drimmies – Mill of Inveramsay Road and continuing along the C120C from Drimmies to Inverurie. BT Openreach cables also run adjacent to the existing A96 dual carriageway to the south of Inverurie.
- 2.14.3 Many of the local roads within the study area have underground and overhead cables running adjacent to the carriageway with connections back to the network in the existing A96 corridor.
- 2.14.4 A number of communications masts providing network coverage for mobile telephone operators are positioned within the study area. These are not within the immediate vicinity of the existing A96.

Gas

- 2.14.5 National Grid have several nationally strategic large diameter high pressure gas pipelines within the study area. Scottish Gas Networks (SGN) also have strategic high-pressure infrastructure within the study area.
- 2.14.6 A 1050mm diameter National Grid high pressure pipeline runs from north-east to south-west through the study area to the north of Inverurie. This passes to the west of Oldmeldrum and crosses the existing A96 to the south of Drimmies. An Above Ground Installation (AGI) is located on this pipeline at Balhalgardy to the north of Inverurie.
- 2.14.7 South and east of Inverurie, 900mm diameter and 1200mm diameter National Grid high pressure pipelines run in parallel from north-east to south-west and cross the existing A96 to the north of the existing Tavelty Junction at Kintore. There is an AGI positioned on the 900mm diameter pipeline near Hogholm Farm Stables.
- 2.14.8 SGN high pressure gas pipelines run near to the existing A96 from East of Huntly to the junction with the B9002 at Oyne Fork. Between Huntly and Hill of Skares, a 273mm diameter high pressure pipeline runs broadly parallel with the existing A96 and crosses it twice at West Adamson and Wedderburn. The pipeline passes between the Hill of Skares and Hill of Foudland at which point it splits into two pipelines (273mm diameter and 300mm diameter) which run to the westbound side of the existing A96 until Oyne Fork. There is an Above Ground Installation (AGI) positioned to the south of Pitmachie which is connected to both pipelines.
- 2.14.9 A section of 219mm diameter SGN high pressure gas pipeline and a further AGI is located to the south of Inverurie. This pipeline crosses the existing A96 to the south

of Thainstone Roundabout with the AGI located to the eastbound side of the existing A96.

- 2.14.10 SGN have medium pressure infrastructure within the study area which runs from the south of Inverurie to Oldmeldrum and parallel with the existing dualled section of the existing A96 between Thainstone and Kintore. SGN low pressure infrastructure is also present within the settlements of Oldmeldrum, Inverurie, Kemnay and Kintore.

Electricity

- 2.14.11 SSE have 275kV, 132kV, 33kV, 11kV and LV overhead and underground infrastructure within the study area.
- 2.14.12 There are two nationally strategic 275kV overhead transmission lines which cross the study area.
- 2.14.13 One 275kV transmission line runs to the south of Huntly and the existing A96, and between the Hill of Skares and Hill of Foudland. It crosses the existing A96 to the north of Colpy and again to the west of Pitcaple before heading south to Kintore substation.
- 2.14.14 The other 275kV transmission line enters the study area from the north before crossing the existing A96 to the west of Pitcaple and heading south to Kintore substation.

Water Supply and Sewerage

- 2.14.15 Scottish Water have several water distribution mains within the study area. A water main runs parallel with the existing A96 between East of Huntly and Leys of Dummuies.
- A water distribution main from Inch runs parallel with the existing A96 between Colpy and the junction with the B992. It also branches off to the east at this junction. There are further crossings of the existing A96 at Old Rayne and Pitcaple before the size and frequency of water distribution mains increase in the area adjacent to Inverurie. A network of 300mm diameter and 250mm diameter water mains runs alongside the existing A96 through Inverurie from the north-west of Blackhall Roundabout to the Thainstone Roundabout. There are also larger diameter water distribution mains in place to the east and north-east of Inverurie.
- 2.14.16 Waste Water Treatment Works (WWTW) are located near the settlements of Inch, Old Rayne, Daviot and Meikle Wartle with larger facilities in place to serve Inverurie and Kintore. Gravity pipes provide connectivity to WWTWs within these settlements. Scottish Water also have several underground reservoirs within the study area.
- 2.14.17 Numerous private water supplies have been identified between East of Huntly and Kintore (Gauchill Junction). These are discussed in Volume 2, Part 3, Chapter 19 Geology, Soils, Contaminated Land and Ground Water.

Wind Turbines

- 2.14.18 Three windfarms are located within the study area. Dummuies windfarm has seven turbines and is located to the south of the existing A96, Glens of Foudland windfarm with 20 turbines is located to the north of the existing A96 and Kirkton Windfarm has three turbines and is located to the north of the existing A96 on the Hill of Tillymorgan. There are also several individual turbines located throughout the study area.

2.15 Public Transport

Bus Services

- 2.15.1 There are 26 scheduled bus services identified operating in the existing A96 corridor with most of the services being provided by Stagecoach. Several services operate from Aberdeen stopping at various towns and villages either side of the existing A96. The residents of Inverurie also benefit from a service that loops around the town.
- 2.15.2 Bus frequencies are typically up to two journeys in each of the AM and PM peaks. The bus services are summarised in Table 2.20.

Table 2.20 Bus Services - Existing A96

Operator	Service	Route
Stagecoach Bluebird	37	Aberdeen - Blackburn - Dyce - Kintore - Inverurie
Stagecoach Bluebird	10	Aberdeen - Direct to Inverurie - Pitcaple - Oyne Fork - Colpy - Glens of Foudland - Huntly - Keith - Elgin - Inverness
Stagecoach Bluebird	X20 and 420	Aberdeen - Blackburn - Kintore - Kemnay - Monymusk - Alford
Stagecoach Bluebird	X37	Aberdeen - Direct to Inverurie
Stagecoach Bluebird / Kineil Coaches	222 and 22	Inverurie Town Circular
Stagecoach Bluebird	421	Inverurie - Kemnay - Monymusk - Alford
Stagecoach Bluebird	41	Inverurie - Pitcaple - Oyne Fork - Oyne - Inch (Loop)
Stagecoach Bluebird	422	Insch - Auchleven - Alford
Kineil Coaches	49	Ellon Park & Ride - Pitmedden - Oldmeldrum - Inverurie
Stagecoach Bluebird	231	Alford - Rhynie - Gartly - Huntly
Bain's Coaches	308	Inverurie - Daviot - Rothienorman - Turriff
Stagecoach Bluebird	747	Ellon To Dyce
Bain's Coaches	305	Oldmeldrum - Newmachar - Dyce - Aberdeen
Stagecoach Bluebird	221	Inverurie - Kintore - Kemnay
Stagecoach Bluebird / Bain's Coaches	240	Oldmeldrum - Inverurie
Stagecoach Bluebird	452	Inverurie - Oldmeldrum - Tarves - Methlick - Strichen - Fraserburgh

Operator	Service	Route
Bain's Coaches	777	Oldmeldrum - Inverurie - Kemnay - Kintore - Blackburn - Westhill - Airport - Dyce Kirkhill Ind Estate
Stagecoach Bluebird	41A	Inverurie - Pitcaple - Oyne Fork - Oyne - Inch - Kennethmont - Gartly - Huntly
Stagecoach Bluebird	248	Inverurie - Oldmeldrum - New Byth
J&M Burns	402	Inverurie - Kintore - Blackburn - Hatton of Fintry - Newmachar - Kingseat
J&M Burns	403	Inverurie - Newmachar - Kingseat
Stagecoach Bluebird	416	Inverurie - Chapel of Garioch - Oyne Fork - Oyne - Inch - Rhynie
Bain's Coaches	417	Inch - Auchleven - Leslie - Rhynie - Lumsden
Stagecoach Bluebird	230	Inch - Kennethmont - Rhynie - Strathdon

Train Services

2.15.3 The study area is currently served by three railway stations at Inch, Inverurie and Kintore. These stations all operate on the Aberdeen to Inverness rail line and have good connections with the existing A96 via the existing local road network. Train service journey times between main destinations are shown in Table 2.21.

Table 2.21 Train Service Journey Times

Station	Inverness	Inverurie	Aberdeen
Inch	1hr 42mins	12mins	39mins
Inverurie	1hr 55mins	-	26mins
Kintore	2hr 01 mins	7mins	20mins

Integrated Transport Links and Parking

2.15.4 There is one 'Park and Ride' facility near the existing A96 at Craibstone just west of Aberdeen. This enables parking and taking a bus into Aberdeen city centre.

2.15.5 There are other car parking facilities at railway stations in the study area:

- Inch Station has 42 car parking spaces and two disabled spaces which are free of charge and the car park is operated by Aberdeenshire Council.
- Inverurie Station is adjacent to Burn Lane Car Park which has 160 free of charge spaces and the car park is operated by Aberdeenshire Council.

- Kintore Station has 168 free of charge parking spaces operated by Network Rail.

2.15.6 Each of these parking facilities also includes cycle spaces and there are electric charging points at Burn Lane and Kintore Station car parks.

3 Development of Route Options

3.1 Overview of Methodology

- 3.1.1 AmeyArup were commissioned to develop the Improvement Strategies B, C and D, identified at Design Manual for Roads and Bridges (DMRB) Stage 1 (refer to Section 1.3 Previous Studies), into dualling options for assessment through DMRB Stage 2.
- 3.1.2 The methodology adopted for the identification and assessment of route options was undertaken in accordance with the DMRB. A progressive option development and appraisal process was used, leading to confirmation of route options which are described and assessed in this report.
- 3.1.3 The process and timeline, showing key steps in the route option development and assessment methodology, is set out diagrammatically on the flowchart in Figure 3.1.

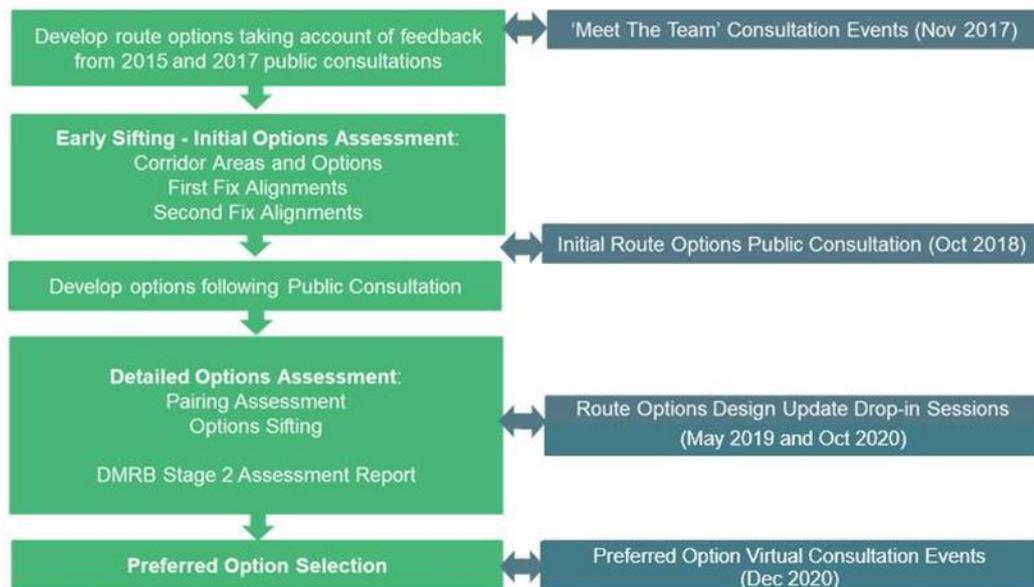


Figure 3.1 Process and Timeline for Development of Route Options

- 3.1.4 Table 3.1 outlines the phases of development that were adopted by AmeyArup to complete the DMRB Stage 2 assessment.

Table 3.1 Development Phases

Development Phase	Description
Corridor Areas	The Improvement Strategies progressed from DMRB Stage 1 assessment were used to generate wide areas within which potential corridors were established. Refer to Section 3.2 for further detail.

Development Phase	Description
Corridor Options	Each Corridor Area was reviewed and refined using available data and subdivided into smaller Corridor Options for initial appraisal with poorly performing Corridor Options sifted out. Refer to Section 3.3 for further detail.
First Fix Alignments	Development of alignments within all Corridor Options was progressed from previous phase. First Fix Alignment Options were then subject to appraisal and the sifting out of poorer performing options within each corridor. Refer to Section 3.4 for further detail.
Second Fix Alignments	End-to-end options were generated from the better performing First Fix Alignments. An appraisal and sifting led to the identification of initial route options for presentation at Public Consultation in October 2018. Refer to Sections 3.5 and 3.6 for further detail.
Third Fix Design / Better Performing Remaining Options Assessment	Processing of public feedback, the development of Third Fix Designs and pairing assessments were undertaken. The better performing remaining route options were presented to the public at Design Update Public Drop-in Sessions in May 2019 and an online design update in October 2020. The designs were assessed in line with design guidance document TD37/93. Refer to Sections 3.7 to 3.10 for further detail.

3.2 Constraints and Corridor Identification

- 3.2.1 Following feedback from 2015 public exhibitions and Meet the Team events in November 2017, corridor areas were developed to define the extents of the study area where potential options associated with each of the DMRB Stage 1 Improvement Strategy Options B, C and D could be considered. The corridor areas originating from the improvement strategies are shown in Volume 5, Figure 3.2.
- 3.2.2 These corridor areas were appraised against Scheme Objectives (refer to 1.6 Programme and Scheme Objectives). The appraisal concluded that all corridor areas had the potential to satisfy these objectives.
- 3.2.3 Engineering and environmental constraints were then identified within the corridors. A review of the constraints within the Strategic Environmental Assessment (SEA) boundary identified that there are no internationally designated environmental sites that would constrain route selection in this area e.g. Special Areas of Conservation (SAC). However, several locations could be considered as

areas containing major constraints and / or cumulative significant constraints where a new dual carriageway could potentially have a 'High Impact'.

3.2.4 The High Impact Constraints identified included:

- Topographical features;
- Scheduled Monuments;
- Sites of Special Scientific Interest (SSSI – geological and biological);
- Gardens and Designed Landscapes (GDL);
- Historic Battlefields;
- Grade A Listed Buildings;
- Local Development Plan (LDP) 2017 proposed Settlements; and
- Existing Settlements.

3.2.5 The High Impact Constraints were defined in two categories as follows:

- **Significant** - Constraints of national importance environmentally or physical barriers such as extreme topography requiring disproportionate engineering solutions; and
- **Serious** - Constraints of slightly lesser significance but which should be avoided if possible.

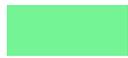
3.2.6 For the purposes of guiding the development of Corridor Options, Significant Constraints and groups of Serious Constraints were combined into 'High Impact Areas' (HIAs) as indicated in Volume 5, Figure 3.2. Further details of the environmental constraints that were used to form part of the HIAs are available in Volume 2, Part 3 Environmental Assessment.

3.3 Corridor Options and Assessment

3.3.1 Corridor Options were then created which sub-divided corridor areas into approximately 2km widths as indicated in Volume 5, Figure 3.2 and described in Table 3.2. The HIAs were used to identify areas to be avoided, where possible.

Table 3.2 Corridor Options

Corridor Identifier (Figure 3.2)	Corridor Option	Description / Location of Corridor Option
	OLN, OLC, OLI	Online North - East of Huntly to Colpy Online Central - Colpy to Pitcaple Online through Inverurie (All based on DMRB Stage 1 Improvement Strategy Option B)
	BN01	Bypass north of Inverurie to west of Kintore (Based on DMRB Stage 1 Improvement Strategy Option B)

Corridor Identifier (Figure 3.2)	Corridor Option	Description / Location of Corridor Option
	BS01	Bypass south of Inverurie (Based on DMRB Stage 1 Improvement Strategy Option B)
	CN01, CN02, CN03 CS01, CS02	Offline - Huntly to north-west of Bennachie Offline – South-east of Bennachie to Kintore (All 'C' corridors are located south of existing A96 and based on DMRB Stage 1 Improvement Strategy Option C)
	D01, D02, D03	Offline - Glens of Foudland to Inverurie (All 'D' corridors are located north of existing A96 and based on DMRB Stage 1 Improvement Strategy Option D)
	D+01, D+02	Offline - East of Huntly to Glens of Foudland (All D+ Corridors are located north of existing A96). Additional Corridor Options included as a result of public feedback from the Meet the Team events in November 2017.
	BN+01	Bypass north of Inverurie to east of Kintore. An additional Corridor Option included to provide an alternative option between a northern bypass of Inverurie and the existing dual carriageway.

- 3.3.2 The Corridor Options were qualitatively assessed against the Scheme Objectives and Scottish Transport Appraisal Guidance (STAG) criteria (refer to Section 1.6 Programme and Scheme Objectives), using a five-point scale.
- 3.3.3 Based on the outcomes of the assessment, only Corridor Option CS01 was sifted out due to it not providing additional benefits over Corridor Option CS02.
- 3.3.4 All other Corridor Options were considered feasible to be taken forward to the First Fix Alignment Phase.
- 3.3.5 The Corridor Options Workshop Report (AmeyArup, August 2019) describes the Corridor Options sifting process in more detail and is available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website:

<https://www.transport.gov.scot/publication/dmrb-stage-2-early-sifting-reports-east-of-huntly-to-aberdeen-a96-dualling/>

Improvement Strategy Option Q

- 3.3.6 Following feedback received since the public consultation held as part of DMRB Stage 1 in 2015 and from the Meet the Team events held in November 2017 for this scheme, AmeyArup undertook a review of the DMRB Stage 1 Improvement Strategy Option Q. The Improvement Strategy Option Q suggested a broadly defined option for the new A96 dual carriageway from the existing A96 at Colpy to the Aberdeen Western Peripheral Route (AWPR) at Goval, Dyce. The Improvement Strategy broadly follows the existing A920 road corridor between Colpy and Oldmeldrum and the A947 corridor between Oldmeldrum and Dyce, joining the AWPR at Goval Junction. The DMRB Stage 1 Assessment, which sifted out Option Q, concluded that the option did not sufficiently fulfil or support all of the Programme Objectives.
- 3.3.7 AmeyArup reconsidered Improvement Strategy Option Q using new information available, such as updated and new traffic models. The appraisal concluded that options following the A947 (i.e. the eastern end of Improvement Strategy Option Q) did not sufficiently address the Scheme Objectives (refer to Section 1.6 Programme and Scheme Objectives) to warrant continued appraisal as a potential route for dualling of the A96. However, the western end of Improvement Strategy Option Q, along the A920 corridor, continued to be developed and assessed as part of the route option development as this coincided with the D03 Corridor Option.

3.4 First Fix Alignments and Assessment

- 3.4.1 First Fix Alignments were developed within the Corridor Options taken forward from the Corridor Options Assessment. The First Fix Alignments did not represent complete end-to-end alignments from East of Huntly to Aberdeen. The First Fix Alignments were intended to assess the feasibility of alternative alignments spread across each Corridor Option.
- 3.4.2 In total, 80 First Fix Alignments were developed across the 16 remaining Corridor Options. The First Fix Alignments are shown within the Corridor Options in Volume 5, Figure 3.3.
- 3.4.3 The First Fix Alignments were developed to:
- Avoid HIAs and other constraints, where possible;
 - Represent a geographical spread across each Corridor Option;
 - Avoid onerous and costly engineering elements, where possible; and
 - Avoid unnecessary social and environmental impacts, where possible.
- 3.4.4 The First Fix Alignments were appraised against the Scheme Objectives and STAG criteria (refer to Section 1.6 Programme and Scheme Objectives). At this phase in the assessment, a seven-point scale ranging from major beneficial to major adverse was used across engineering, environmental and traffic and transportation appraisals. The seven-point scale allows greater differentiation and more granularity between the adverse and beneficial impacts along the alignments.
- 3.4.5 Following the appraisal, the First Fix Alignments within individual Corridor Options were compared against each other to identify the better performing alignments or better performing sections of an alignment, based on a combined engineering, environmental and traffic and transportation appraisal. If there were better performing sections of alignments, these were linked to other better performing sections of alignments within the Corridor Option to form hybrid alignments. This

process allowed the identification of the best performing First Fix Alignment option within each Corridor Option.

3.4.6 The assessment concluded that no First Fix Alignments from Corridor Options CN01, BN+01, CS02, OLI or D+02 should be progressed to Second Fix due to their poorer performance against the Scheme Objectives or STAG criteria.

3.4.7 The better performing alignments identified through the appraisal and assessment process were progressed to Second Fix Alignment development.

3.4.8 The First Fix Alignment Workshop Report (AmeyArup, August 2019) describes the assessment and sifting of First Fix Alignments in more detail and is available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website:

<https://www.transport.gov.scot/publication/dmrb-stage-2-early-sifting-reports-east-of-huntly-to-aberdeen-a96-dualling/>

3.5 Second Fix Alignments and Assessment

3.5.1 Following the First Fix Alignment appraisal, further design work was undertaken on the better performing alignments with a view to developing end-to-end Second Fix Alignments. This included:

- Developing links to connect the better performing First Fix Alignments to create a series of end-to-end alignments as shown in Volume 5, Figure 3.4; and
- Alignments that served similar functions across discrete sections were subject to an assessment in line with the “Pairing” methodology described in DMRB TA 30/82. The poorer performing sections were then sifted out.

3.5.2 Further to the above design development work, the alignments sections remaining were combined to make a longlist of end-to-end alignments progressed to the Second Fix Alignment development.

3.5.3 Sub-criteria based on the Scheme Objectives and STAG Criteria (refer to Section 1.6 Programme and Scheme Objectives) were used to assess each end-to-end option. Traffic and transportation, environmental and engineering criteria were used for these assessments. This assessment was based on a seven-point scale, as used in the First Fix Alignment appraisal.

3.5.4 The method by which the options were identified and the result of the assessment, was presented to a multi-disciplinary sifting workshop with Transport Scotland in July 2018. Details of the workshop are described in the Route Options Sifting Workshop Report (AmeyArup, August 2019) and is available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website:

<https://www.transport.gov.scot/publication/dmrb-stage-2-early-sifting-reports-east-of-huntly-to-aberdeen-a96-dualling/>

3.5.5 The assessment was ratified at the workshop and concluded that the “better performing” route options from the longlist considered, should be used to obtain public feedback.

3.5.6 Volume 5, Figure 3.4 shows all initial route options considered, i.e. those sifted out at First Fix, those sifted out at Second Fix, and those deemed to be better performing.

- 3.5.7 Consequently, the workshop endorsed the following recommendations:
- Remaining route options within Improvement Strategy Option C were determined to be less favourable than better performing route options within Improvement Strategies Options B and D;
 - The better performing initial route options were proposed for presentation at public consultations to obtain public feedback in October 2018; and
 - Further design development and assessment would be undertaken to reduce the number of better performing initial route options prior to completing the DMRB Stage 2 Assessment on the remaining options.

3.6 Initial Route Options for Consultation – October 2018

- 3.6.1 The initial route options were presented to the public and stakeholders as a series of individually named and coloured route options. The naming convention related to the colour of the route combined with a unique numbered reference:
- Lime L1;
 - Cyan C1 and C2;
 - Blue B1 to B3;
 - Pink P1 to P3;
 - Brown Br1 to Br3;
 - Green G1 to G3;
 - Violet V1 to V3; and
 - Orange O1 to O4.
- 3.6.2 The route options presented at the October 2018 public exhibitions are shown in Volume 5, Figure 3.5. Indicative junction locations were also included in the exhibition plans.
- 3.6.3 The exhibitions were held between 12 noon and 7pm at the following locations on the dates shown below and were attended by over 2100 people:
- Inverurie Town Hall 08 October 2018;
 - Inverurie Town Hall 09 October 2018;
 - Huntly, Stewarts Hall 10 October 2018; and
 - Blackburn, Kinellar Community Hall 11 October 2018.
- 3.6.4 The exhibitions were staffed by representatives of Transport Scotland and AmeyArup who were available to answer questions raised by attendees.
- 3.6.5 Schools and MSP / Local Councillor events were also held alongside these exhibitions to inform and educate the local community about the scheme.

3.6.6 All of the information presented at the initial route options consultation is available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website: <https://www.transport.gov.scot/publication/exhibition-materials-public-exhibitions-october-2018-east-of-huntly-to-aberdeen-a96-dualling/>.

3.6.7 Comment and feedback were welcomed from attendees and over 1400 responses were received. This was used to inform the ongoing development and assessment of the initial route options. Responses were issued by Transport Scotland to all correspondence received.

3.7 Third Fix Design and Pairing Assessments

3.7.1 Following the October 2018 consultation, AmeyArup developed the Third Fix design of the route options further incorporating the following:

- Indicative junction layouts in accordance with the A96 Programme Junction Strategy (Jacobs, May 2015 Rev 5), where applicable;
- Application of central reserve and verge widening for visibility purposes;
- Feedback from Statutory Bodies i.e. Scottish Environment Protection Agency, (SEPA), Historic Environment Scotland (HES) and Scottish Natural Heritage (SNH);
- Addressing, where possible, impacts identified during the Second Fix Alignments assessment; and
- Receipt of updated information regarding planning applications and approvals.

3.7.2 This resulted in some alterations to the route options that were presented to the public in October 2018 as shown in Volume 5, Figure 3.6. The key alterations were located as follows:

- Location A - Removal of a grade separated junction at the western tie-in near Huntly. This was replaced by a standard dual to single carriageway taper which enables flexibility for connection to the future A96 Dualling Programme Central Section (Refer to Figure 1.1);
- Location B - Minor amendment to avoid direct impact on property access at Saddle Hill;
- Location C - Alignment development to include a proposed grade separated junction at Colpy, which avoids direct impact on properties and a Scheduled Monument (Colpy Cottage);
- Location D - Amendment to avoid a new property under construction. Junction at Lawrence Road amended to provide east facing slip roads only based on traffic demand;
- Location E - Removal of a grade separated junction at Whiteford / Durno as predicted traffic flows did not justify its inclusion. Access between Whiteford and Durno will be maintained via an underbridge to accommodate existing local roads;
- Location F - Amendment to avoid direct impact to the site of a planning application for a new residential property; and

- Location G - Amendment to follow contour of hillside to reduce the scale of earthworks and associated landscape impact at Hill of Selbie.

3.7.3 The next step focussed on reducing the number of options being considered. This led to multi-disciplinary comparative “Pairing” assessments being undertaken. These were based on the principles set out in DMRB TA 30/82 of comparing two options at a time, where they perform the same function. Selecting the better performing option of the pair allowed the design development and subsequent assessment to progress with a lower number of options.

3.7.4 Four key pairing assessments were undertaken, and in each case, the better performing option was identified, with the poorer performing option being sifted out. The deselected options are shown in Volume 5, Figure 3.7 in dashed lines with the remaining options shown in solid lines.

The pairing assessments are available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website:

<https://www.transport.gov.scot/publication/dmrb-stage-2-pairing-assessments-east-of-huntly-to-aberdeen-a96-dualling/>

and are outlined below:

- **Pairing Assessment Cyan / Lime:** Cyan route option C1 is better performing (Refer to Cyan / Lime Pairing Assessment, AmeyArup, August 2019);
- **Pairing Assessment Cyan / Red to Pink:** Pink route option P2 is better performing (Refer to Cyan / Red to Pink Pairing Assessments, AmeyArup, August 2019)
- **Pairing Assessment Blue / Pink:** Pink route options P2 and P3 are better performing (Refer to Blue / Pink Pairing Assessment, AmeyArup, August 2019); and
- **Pairing Assessment Violet / Green:** Violet route options V1, V2 and V3 are better performing (Refer to Green / Violet Pairing Assessment, AmeyArup, August 2019).

3.7.5 The following route options from the initial options presented in October 2018 were therefore deselected and removed from further consideration following the assessments undertaken:

- Lime route option L1;
- Cyan route option C2;
- Pink route option P1;
- Blue route option B1, B2 and B3; and
- Green route option G1, G2 and G3.

3.7.6 The better performing end-to-end options made up of the remaining six coloured route options were proposed for presentation to the public at the Route Options Design Update Drop-in Sessions in May 2019, namely:

- Cyan route option;
- Red route option;

- Pink route option;
- Brown route option;
- Violet route option; and
- Orange route option.

3.8 Route Options Design Update – May 2019

3.8.1 Design Update Public Drop-In Sessions were held in May 2019 to:

- Provide a design update on development of the route options since the October 2018 Public Consultation. This included more detailed plans of all the options showing earthworks and indicative junction layouts; and
- Present the results of the multi-disciplinary “Pairing” comparative assessment that was carried out, which reduced the number of remaining route options.

3.8.2 The route options presented to the public at the May 2019 Drop-In sessions are shown in Volume 5, Figure 3.8.

3.8.3 The drop-in sessions were staffed by representatives of Transport Scotland and AmeyArup who were available to answer questions raised by attendees.

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

- Inverurie, Wyness Hall 28 May 2019;
- Inverurie, Wyness Hall 29 May 2019;
- Blackburn, Kinellar Community Hall 30 May 2019; and
- Huntly, Gordon Arms Hotel 31 May 2019.

3.8.5 Schools and MSP / councillor events were also held alongside these exhibitions to inform and educate the local community about the scheme.

3.8.6 All of the information presented at the Drop-In Sessions is available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website: <https://www.transport.gov.scot/publication/exhibition-materials-may-2019-east-of-huntly-to-aberdeen-a96-dualling/>.

3.8.7 Comment and feedback were welcomed from attendees and over 800 responses were received. This was used to inform the ongoing assessment of route options. Responses were issued by Transport Scotland to all correspondence received.

3.9 Further Design Development

3.9.1 The remaining options were examined and developed further using feedback from ongoing consultation, additional information obtained from site surveys and further site visits. Further traffic modelling and a review of junction locations on all route options was also undertaken.

3.9.2 This resulted in changes at four locations as shown in Volume 5, Figure 3.9. These locations were:

- Red / Cyan Route Option – Colpy Junction relocated north of Colpy Village and removal of east facing slips due to predicted traffic demand and proximity of Kellockbank Junction on Pink and Brown route options;

- Pink Route Option – Lawrence Road Junction relocated closer to the existing A96 and renamed as Kellockbank (Pink);
- Brown Route Option – removal of west facing slips at Kellockbank Junction due to predicted traffic demand and proximity of Colpy Junction on Cyan and Red route options; and
- Orange Route Option - Addition of a junction at Pitscurry to reduce traffic travelling to / from the north of Inverurie through the town centre to access the Orange route option.

3.9.3 These were presented to the public in an online design update in October 2020, details of which are available on the Transport Scotland A96 Dualling East of Huntly to Aberdeen website:

<https://www.transport.gov.scot/projects/a96-dualling-inverness-to-aberdeen/a96-east-of-huntly-to-aberdeen/project-details/#56809>

3.10 Remaining Better Performing Route Options

3.10.1 Following the conclusion of the Third Fix design development, “Pairing” assessment and the feedback from the Route Option Design Update Public Drop-in Sessions (Sections 3.7 to 3.9), the remaining better performing route options are shown diagrammatically on Figure 3.10.

3.10.2 As a result, the choice of preferred end-to-end option for the full length of the scheme can be determined from the combination of better performing route options split geographically as follows:

- East of Huntly to Colpy – Cyan or Red route option;
- Colpy to Pitcaple – Pink or Brown route option; and
- Pitcaple to Kintore – Violet or Orange route option.

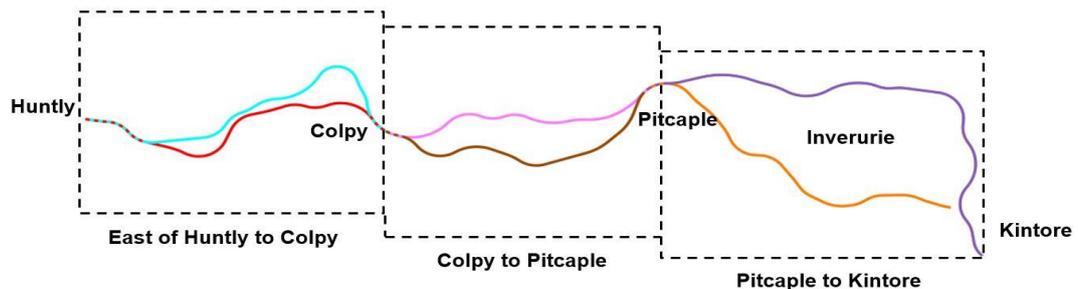


Figure 3.10 Remaining Better Performing Route Options

Therefore, the six remaining better performing route options which combine to form eight end-to-end options are assessed and reported in the remaining sections of this report.

3.11 Cost Estimates for End-to-End Options

3.11.1 Scheme cost estimates have been prepared for each of the remaining end-to-end options. The costs for each option have been split into three categories Works Costs, Preparation Costs and Risk and Optimism Bias.

Works Costs

3.11.2 The quantifiable items of the works for each route option have been measured and a unit rate has been applied to determine the costs. Route option costs were then combined to provide end-to-end option cost estimates. Rates have been derived from previous projects and Spon's Civil Engineering and Highway Works Price Book 2019. Works items which have been quantified are listed below:

- Site Clearance;
- Fencing;
- Road Restraint Systems;
- Drainage;
- Earthworks;
- Pavements;
- Footways and Paved Areas; and
- Structures.

3.11.3 Other works costs which could not be readily quantified at this stage have been assessed as a percentage of the total works costs based on comparable Transport Scotland schemes. Details of the percentage allowances made at this stage are included in Table 3.3.

Table 3.3 Percentage Allowances

Works Item	Percentage of Works Costs
Preliminaries	15%
Other Roadworks Items including Kerbs, Signs and Road Markings, Lighting Columns and VMS Signs	3% (of the total works cost, excluding Earthworks and Structures Costs)
Landscaping and Ecology	2%
Accommodation Works	3%

Preparation Costs

Utility Diversions and Statutory Undertakers

3.11.4 Utility conflicts have been identified for each route option and a cost estimate for the diversion / protection of the utility has been applied.

Land and Property Costs

3.11.5 The District Valuer has provided indicative rates for the various land classifications to provide an initial estimate of land acquisition for each route option.

Detrunking Costs

3.11.6 Following construction and opening of the dual carriageway, the existing A96 will be detrunked. The length of detrunked route has been quantified as the length of

existing A96 replaced by dual carriageway. A 'per km' rate has been applied to all route options for the length of existing A96 to be detrunked. This rate covers costs for signage, any necessary changes in road layout and costs associated with adoption by the local authority.

Preparation and Administration Costs

- 3.11.7 Preparation and administration costs have been included as a percentage allowance of the combined works, land and property, utility diversion and detrunking costs. The percentage that has been applied (DMRB Stage 2) is 9% as detailed in the DMRB Volume 15, Section 1, Part 6 The NESMA Manual.
- 3.11.8 On-site supervision and testing costs have been included as a percentage allowance of the combined works, land and property, utility diversion and detrunking costs. The percentage that has been applied is 5% as detailed in the DMRB Volume 15, Section 1, Part 6 The NESMA Manual.

Risk and Optimism Bias

- 3.11.9 The risks to the project were identified and recorded in a series of risk registers (one for each route option). 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 Monte Carlo simulation (using Crystal Ball software) was carried out for each end-to-end option to generate a quantified risk allowance which has been included within the cost estimates.
- 3.11.10 The Optimism Bias for the scheme has been applied to the sum of the works costs, preparation costs and quantified risk register cost allowance. Optimism Bias of 25% has been used for this stage of the assessment

Assumptions and Exclusions

- 3.11.11 The cost estimate is based on the following assumptions:
- Adequate labour and plant are available throughout the construction period;
 - A source for imported acceptable fill material can be found within a reasonable distance of the scheme; and
 - Access to the site is available on or before the contract start date and continues to be available throughout the contract period.
- 3.11.12 The cost estimate does not include for the following:
- Future inflation;
 - Value Added Tax;
 - Legal fees;
 - Financing or other charges; and
 - Contractual Risks based on procurement strategy or contract mechanism.

Cost Estimate Summary

3.11.13 The cost estimate for each end-to-end option at Quarter 2, 2018 prices is provided in Table 3.4.

Table 3.4 Route Option Cost Estimate Summary

End-to-end option	Cost Estimate Q2 2018
Cyan-Pink-Violet	£890m
Cyan-Pink-Orange	£899m
Cyan-Brown-Violet	£943m
Cyan-Brown-Orange	£933m
Red-Pink-Violet	£960m
Red-Pink-Orange	£970m
Red-Brown-Violet	£993m
Red-Brown-Orange	£1,003m



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