

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services  
Route Corridor Preliminary Assessment  
Route Corridor 14 – Coilessan Glen

Route Corridor Details	
Route Corridor Option	Route Corridor 14 – Coilessan Glen
Route Corridor Description	This route corridor is a combination of new offline carriageway and online upgrading works. The route corridor starts at the A83 Trunk Road at Ardgartan to the east of the A83 at Rest and Be Thankful, where a new section of road will take the route south along the west side of Loch Long before turning west at Coilessan Glen to Lochgoilhead. The overall length of the route corridor is approximately 19 kilometres. The route then generally follows the existing road network, B839 and A815 from Lochgoilhead to the A83 Truck Road at Cairndow.
Rationale for Route Corridor	The Coilessan Glen route corridor was a suggestion submitted as part of the recent public consultation on A83 Access to Argyll and Bute project. This route corridor is considered to offer a potential alternative access route into Argyll and Bute bypassing the main landslide risk area on the A83 Trunk Road at the Rest and Be Thankful.
Geographic Context	The route corridor lies within the Argyll & Bute region, which comprises solely of the entirety of the Argyll & Bute local authority area. The route corridor end points are located a straight-line distance of approximately 30-37 miles from the city of Glasgow. The eastern extents of the route corridor is situated on the north shore of Loch Long and the A83 Trunk Road at Ardgartan. The route corridor then heads south along the west side of Loch Long before turning west along Coilessan Glen until it reaches Lochgoilhead. It then travels north-west following roughly the B839 on the east side of River Goil and then continues north-west following the B839 through Gleann Beag or Hell's Glen to the A815 and turns north-east. The north-west extents of the corridor is situated at the A83 Trunk Road at Cairndow. The route corridor is located partially within the Loch Lomond and The Trossachs National Park (LLTNP) and there are environmentally designated sites both within and in proximity of the route corridor.
Social Context	<p>Given the geographically remote nature of large areas of Argyll &amp; Bute, reducing the duration of journey times and improving journey time reliability for both strategic and local traffic has the potential to impact positively on deprivation levels, both geographic and economic.</p> <p>The Scottish Index of Multiple Deprivation (SIMD) identifies concentrations of deprived areas across Scotland. Argyll &amp; Bute consists of 125 data zones, with 10 data zones (8%) identified as being amongst the 15% most overall deprived data zones in Scotland. These are located in the region's 5 main towns - Helensburgh, Oban, Dunoon, Campbeltown and Rothesay. The Geographic Access to Services considers deprivation in terms of drive times and public transport</p>

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	<p>times to a selection of basic services such as schools, health services and retail centres. Forty-eight (38%) of Argyll and Bute's data zones are within the 15% most 'access deprived' data zones in Scotland – most of which are located outside the main towns.</p> <p>The region's population has been in decline for over a decade, against a backdrop of a population increase at the national level.</p> <p>Data from NHS Highland estimates that there are 26,000 referrals for Argyll &amp; Bute patients each year, of which 44% are to hospitals within the region and 56% are to hospitals in the NHS Greater Glasgow and Clyde area. Disruption on the transport network can lead to missed appointments and have an adverse impact on patients' health and wellbeing.</p> <p>The region has twenty-three inhabited islands, more than any other local authority in Scotland, with seventeen percent of the regions' population inhabiting the islands. The A83 Trunk Road provides accessibility to services on the mainland via Kennacraig port, where ferry services depart to Islay with onward connections to Jura and Colonsay.</p>
Economic Context	<p>The A83 Trunk Road is one of only two east-west strategic trunk road network connections between Argyll &amp; Bute and the central belt. The lack of a reliable strategic route linking Argyll &amp; Bute with the rest of the country is understood to be constraining economic growth in the region. When the road connection via the A83 Trunk Road is severed, the impact on residents, visitors and businesses is severe due to the lack of alternative transport options.</p> <p>The A83 Trunk Road is known to carry goods of significant value to both the regional and national economy (including whisky and seafood). The A83 Trunk Road is also a key route for tourism, and a proposal to transform the Crinan Canal into a major tourism attraction in Mid-Argyll, could benefit significantly from improved resilience and / or access to the region. Anecdotal evidence suggests closures and restrictions cost the local economy £50k-£60k per day in addition to longer-term impacts on business investment within the region and, subsequently, the region's job market.</p> <p>Due to a large proportion of the region's geographic remoteness from the major economic centres of the central belt, only a few large scale, high skill industries are located within the area. The region's economy tends to be heavily influenced by sectors with lower growth, such as agriculture and public services. Given the focus on economic recovery post-COVID-19, enhanced connectivity for the Argyll &amp; Bute region could contribute towards increasing inward</p>

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	investment and job opportunities for local communities. Improved and reliable access for Bute and Cowal and Mid-Argyll, Kintyre and Islay has the potential to have a transformational effect on local / regional economies.
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Transport Planning Objectives		
Objective	Performance against planning objective	
TPO1	Resilience – reduce the impact of disruption for travel to, from and between key towns within Argyll & Bute, and for communities accessed via the strategic road network.	<p>This route corridor offers enhanced resilience for both strategic A83 Trunk Road traffic accessing Cowal &amp; Bute and Mid-Argyll, Kintyre and the Islands, and for local traffic travelling to / from and between key towns and communities within Argyll &amp; Bute. The impact of landslide induced closures at the main landslide risk area on the A83 Trunk Road, at the Rest and be Thankful, is effectively bypassed by this route corridor. Communities located within close proximity to Glen Croe, including Arrochar, Inveraray and Lochgoilhead, which are subject to the longest diversion routes during closure of the A83 Trunk Road at the Rest and Be Thankful, are likely to benefit significantly from the enhanced resilience provided by this route corridor.</p> <p>In providing an additional route to the existing A83 Trunk Road (assuming it remains operational) enhanced resilience will be provided for large parts of Argyll &amp; Bute, offering a more reliable connection between the region, the central belt and beyond.</p>
TPO2	Safety – positively contribute towards the Scottish Government’s Vision Zero road safety target by reducing accidents on the road network and their severity.	<p>Minor reductions in transport related casualties could, potentially, be realised as a result of reductions in vehicle kilometres associated with fewer landslide induced road closures and the associated long diversion routes for strategic traffic travelling to and from Argyll &amp; Bute. During periods of closure the new route would provide a shorter diversion route for trips to the south.</p>
TPO3	Economy – reduce geographic and economic inequalities within Argyll & Bute through improved connectivity and resilience.	<p>This route corridor does not provide a significant change in connectivity when compared to the existing route, under normal operating conditions, due to the longer travel distance for both strategic and local traffic using the A83 trunk road. The route corridor does, however, offer</p>

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		potential enhancements in resilience, provided as a result of mitigating landslide induced closures, improving access to key domestic and international markets.
TPO4	Sustainable travel – encourage sustainable travel to, from and within Argyll & Bute through facilitating bus, active travel and sustainable travel choices.	It is considered unlikely that this route corridor would have any significant impact on public transport usage, active travel, reducing transport poverty or reducing reliance on private cars. This is primarily due to the nature of the route corridor and the areas within which it is located. Investment in a new route corridor within the region would however provide an opportunity to include enhanced active travel provision as part of the design.
TPO5	Environment – Protect the environment, including the benefits local communities and visitors obtain from the natural environment, by enhancing natural capital assets and ecosystem service provision through delivery of sustainable transport infrastructure.  An example of ecosystem service provision is improving water quality regulation.	The range and scale of potential environmental effects identified for this route corridor is such that it is likely that extensive environmental mitigation will be needed and there is the potential for a range of significant environmental impacts that could affect ecosystem service provision.

Existing Route Corridor Conditions		
Engineering	Route Corridor Length	The route corridor is approximately 19km long.
	Existing Roads	The route corridor intersects the A83 Trunk Road at both its eastern and north-western extents.  The route corridor generally follows the Local Authority operated / maintained 'A' / 'B' / 'C' roads listed below: B839 and A815  The route corridor intersects the following Local Authority operated / maintained 'A' / 'B' / 'C' roads.  B839, B828 and A815

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	Existing Accesses	<p>A class road: 1  B class road: 2  C class road: 0  Unclassified road/direct access: 5</p> <p>Relative to the other route corridors, the low number of accesses noted above is attributed to the undeveloped, rural setting of the route corridor.</p> <p>All local accesses from the A83 in the area around Glen Croe would be retained should this route corridor be taken forward; however, the additional work to retain these accesses has not been included in the Preliminary Assessment of this route corridor.</p>
	Topography and Land Use	<p>Ground levels at the start of the route corridor rise from the A83 Trunk Road at Ardgartan, at a height of approximately 10m above ordnance datum, to approximately 100m over 2.2km at the bottom of Coilessan Glen on the west bank of Loch Long. The levels then steeply raise through Coilessan Glen to a peak of approximately 500m above ordnance datum over 3km at the top of the glen before descending steeply over 3.1km to 20m above ordnance datum at the B839 at Lochgoilhead. Thereafter the corridor follows the generally level valley floor following the River Goil for approximately 2.6km to the junction with the B828 at the bottom of Gleann Beag or Hell's Glen. The corridor then raises steeply over the glen over 3.2km to a peak of approximately 230m above ordnance datum before descending over 1.7km to 120m at the junction to the A815. The route corridor then heads generally north-east, following the A815, on the eastern bank of Loch Eck for approximately 2.9 kilometres. Ground levels along the A815 section of the route corridor fall gently from the junction with the B839 to approximately 60m above ordnance datum at the A83 Trunk road at Cairndow.</p> <p>Land use within the route corridor is primarily coniferous plantation woodland, which covers most of the offline section of the corridor and the lower slopes of the sections following the existing road networks. There are residential and commercial properties long the corridor with the majority of these within or near Lochgoilhead and at Ardgartan where there are a number of holiday homes.</p>
	Geology / Geomorphology	<p>The geomorphology in this route corridor is characterised by U-shaped valleys and often relatively smooth slopes. These are generally forested on the lower sections, with some more rocky terrain evident in the more elevated sections of the route corridor, for example Cnoc Connich, Ben Donich and Cruach nam Mult. The route corridor</p>

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		<p>The proposed route corridor is predominantly underlain by Dalradian metamorphic rocks of the Southern Highland Group. In the eastern part of the route corridor these comprise predominantly psammities, pelites, semipelites, schists and metawackes of the Beinn Bheula Schist Formation. The strata display some variation in the orientation of the foliation, indicative of the folding and deformation to which they have been subject. To the west, the route corridor passes through a sequence of further metamorphic strata including the Ben Lui Schist Formation, the Argyll Group and the Ardrishaig Phyllite Formation. These strata generally dip between 20 and 30 degrees to the north-west.</p> <p>The area has been intruded by several swarms of igneous dykes. The orientation of these is variable; however, the most persistent are oriented east to west, and the most numerous are oriented north-east to south-west.</p> <p>The area has also been subject to considerable faulting activity. The predominant orientation for these is north-east to south-west; there are 5 major faults of this orientation between Lochgoilhead and Loch Fyne. Frequent shorter, east to west oriented faults, are also recorded. It is noted that the geological mapping in Coileissan Glen and further to the east is less detailed than the remainder of the route corridor. The absence of recorded faults in this area does not preclude their presence.</p> <p>One borehole is recorded at Ardgartan however no details of strata depths or descriptions are recorded. No further historical ground investigation (GI) is recorded within the route corridor.</p> <p>References:</p> <ul style="list-style-type: none"><li>• British Geological Survey, Geological Survey of Scotland, 1:63,360/1:50,000 geological map series. Accessed via BGS maps portal <a href="https://www.bgs.ac.uk/information-hub/bgs-maps-portal/">https://www.bgs.ac.uk/information-hub/bgs-maps-portal/</a>, October to December 2020.</li><li>• British Geological Survey, Onshore GeoIndex, <a href="https://mapapps2.bgs.ac.uk/geoindex/home.html">https://mapapps2.bgs.ac.uk/geoindex/home.html</a>, accessed October to December 2020. Datasets used include National Landslide Database (NLD), Mass Movement Deposits (1:50,000 scale), Superficial Deposits (1:50,000 scale), Bedrock Geology (1:50,000 scale), Linear Features (1:50,000 scale), Borehole Records.</li></ul>
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		<ul style="list-style-type: none"> <li>British Geological Survey, The BGS Lexicon of Named Rock Units, <a href="https://webapps.bgs.ac.uk/lexicon/home.cfm">https://webapps.bgs.ac.uk/lexicon/home.cfm</a>. Accessed October to December 2020.</li> </ul>
	Hydrology and Drainage	This is covered under 'Water Environment' in the 'Environment' part of this table.
	Structures	There are no existing structures that would be retained in the route corridor.
Environment	Biodiversity, Fauna and Flora	<p>The route corridor intersects Glen Etive and Glen Fyne Special Protection Area (SPA), Beinn an Lochain Site of Special Scientific Interest (SSSI), Hells Glen SSSI, and Upper Loch Fyne and Loch Goil Marine Protected Area (MPA).</p> <p>There are 47 parcels of woodland listed on the Ancient Woodland Inventory (AWI) within the route corridor.</p>
	Population and Human Health	<p>The route corridor is predominantly rural in nature, with the settlements of Ardgartan, Coileissan and Lochgoilhead located within the route corridor containing numerous residential receptors. There are also several residential properties located within the northern extent of the corridor at Ardno and Cairndow.</p> <p>Loch Lomond and Cowal Way (a long distance walking path) intersects the route corridor to the west of Lochgoilhead, where it proceeds to travel east through the centre of the corridor towards Loch Long. The path then travels north along the western shore of Loch Long past Ardgartan where it exits the route corridor.</p> <p>Tom a Chluig Walk (Blue) and Glen Donich Walk (Red), forest walking routes, pass through the route corridor at Lochgoilhead, with both travelling north-east around Donich Water before looping back to Lochgoilhead.</p> <p>Ardgartan Peninsula Circuit and Coileissan Glen &amp; Shore Circuit (both forest cycling routes) also pass through the corridor. Ardgartan Peninsula Circuit intersects the route corridor to the south-west of Lochgoilhead, travelling north through the corridor to the east of the B839 road until it exits the route corridor. The cycling circuit then re-enters the eastern extent of the route corridor at Ardgartan where it travels south along the western shore of Loch Long until it exits the route corridor once more. Coileissan Glen &amp; Shore Circuit intersects the eastern extent of the corridor at Ardgartan, travelling south along the western shore of Loch Long. The circuit then loops around outside the corridor before re-entering the eastern extent of the route corridor and travelling north until it reaches Coileissan Glen where it then travels east until it joins the first section of the circuit which travels south alongside Loch Long.</p>



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		<p>There are also several Corbetts, mountains and hills popular with hill-walkers within the route corridor, including Cruach nam Mult, Stob an Eas, Stob Liath, Ben Donich, Cnoc Coinnich, The Brack and Cruach Fhianach.</p>
	<p>Water Environment</p>	<p>The route corridor crosses or is in the vicinity of seven water bodies classified under the Water Framework Directive, including:</p> <ul style="list-style-type: none"> <li>• Four river water bodies: Croe Water, Donich Water/ Allt Coire Odhair, River Goil/ Allt Clinne Mhoir and Kinglas Water; and</li> <li>• Three coastal water bodies: Loch Long (North), Loch Goil, Loch Fyne (Upper Basin)</li> </ul> <p>The route corridor also contains approximately 50-60 minor watercourses.</p> <p>SEPA Flood Maps (SEPA, 2020) indicates that the route corridor may be at existing coastal flood risk from Loch Long, Loch Goil and Loch Fyne during a medium likelihood event (0.5% Annual Exceedance Probability (200-year) event). The route corridor may be at existing fluvial flood risk from River Croe, Coileissan Burn, Donich Water/Allt Coire Odhair, River Goil/ Allt Clinne Mhoir, Allt Glinne Bhig and Kinglas Water during a medium likelihood event (0.5% Annual Exceedance Probability (200-year) event).</p> <p>There are no designated sites protected for water environment interests within the route corridor. The Loch Long and Loch Fyne Shellfish Water Protected Areas are within the vicinity of the route corridor. There are Active Aquaculture Sites, CAR licenced fish farms and Classified Shellfish Harvesting Areas within the vicinity of the route corridor.</p> <p>The route corridor passes through two surface water Drinking Water Protected Areas. No bathing waters are in the vicinity of the route corridor.</p>
	<p>Soil</p>	<p>Soil type within the route corridor is mixed with peaty podzols, peaty gleys, montane soils, brown soils and mineral podzols all present. Peaty podzols are predominant within the route corridor with montane soils located on the higher slopes and brown soils, mineral podzols and peaty gleys present in smaller groups throughout the route corridor.</p> <p>The route corridor, where peat is present, predominantly transects peat identified as Class 5 (no peatland habitat recorded, soils are carbon rich and deep peat) and Class 3 (not priority peatland habitat with carbon rich soils and</p>

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		<p>some areas of deep peat) in the Carbon and Peatland 2016 Map. However, the route corridor also transects small pockets of peat identified as Class 2 (nationally important carbon-rich soils, deep peat and priority peatland habitat, areas of potentially high conservation value and restoration potential) located near the route corridor boundary at Ben Donich, Tom nan Gamhna and Cruach nan Capull. Peat identified as Class 1 (nationally important carbon rich soils, deep peat and priority peatland habitat, areas likely to be of high conservation value) is present in one location in the valley between The Brack and Cnoc Coinnich.</p> <p>Given the combination of soils, climatic conditions and topography the Land Capability for Agriculture (LCA) Class within the route corridor is predominantly Class 6 (Class 6.1, 6.2 and 6.3) which is non-prime land capable of use as rough grazing only. However, there are areas of Class 5 (Class 5.1 and 5.2) at Ardgartan, either side of the B839 between Lochgoilhead and the B828, and either side of the A815, which is non-prime land capable for use as improved grassland.</p> <p>There are no Geological Conservation Review (GCR) sites in the route corridor.</p> <p>Given the combination of soils, topography and climate the Land Capability for Forestry (LCF) class is predominantly Class F5 (Land with limited flexibility for the growth and management of tree crops), Class F6 (Land with very limited flexibility for the growth and management of tree crops) and Class F7 (Land unsuitable for producing tree crops). However, there are small pockets of Class F2 (Land with very good flexibility for the growth and management of tree crops) located around Ardgartan, Lochgoilhead and near the banks of Loch Fyne, and a larger area of F4 (Land with moderate flexibility for the growth and management of tree crops) adjacent to the A815. There are large areas of commercial forestry located throughout the route corridor.</p> <p>The north-western section of the route corridor around Binnein an Fhidleir includes land identified in the Argyll &amp; Bute Council Woodland and Forestry Strategy as 'existing planted woodland' and 'sensitive' (areas where the nature or combination of sensitivities restricts the scope to accommodate further woodland expansion or removal). The remainder of the route corridor is located within the LLTNP Authority Trees and Woodland Strategy area. Land within the study area is identified in the strategy as 'Preferred' (where native woodland creation would have the greatest impact in improving woodland connectivity, providing a more suitable climate for tree growth) predominantly on the western slopes of Cnoc Coinnich above Lochgoilhead and the south-western slopes of Ben Donich. Other areas are identified as 'Potential' (where native woodland creation would contribute to the wider strategy's objectives) throughout the route corridor and 'Sensitive' (where there is limited capacity for woodland creation due to higher value nature conservation or landscape objectives) in the land around Lochgoilhead.</p>
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	Air Quality	<p>The route corridor is rural in nature; receptors sensitive to changes in air quality are present within the settlements of Ardgartan and Coilessan, and at Lochgoilhead to the west before the corridor heads northward. There are also several properties within the northern extent of the route corridor, including at Ardno, as well as the settlement of Cairndow.</p> <p>There are no AQMAs within the route corridor or in the Argyll and Bute Council area. Air quality in Argyll and Bute is considered to be generally very good and complies with all the air quality objectives for Scotland (Argyll and Bute Air Quality Annual Progress Report, 2020).</p> <p>Air quality in Argyll and Bute is considered to be generally very good and complies with all the air quality objectives for Scotland (Argyll and Bute Air Quality Annual Progress Report, 2020). Modelling results for sources of nitrogen dioxide and fine particulates in the Argyll and Bute Air Quality Annual Progress Report (APR) illustrate that background concentrations are very low, with the traffic considered as the main potential source of pollution in the absence of industry hotspots in the region. The Argyll and Bute APR did not identify any areas where air quality objectives may be under threat and where specific actions would be required to improve air quality.</p>
	Climatic Factors	<p>The baseline for climatic factors is not considered to differ greatly between the route corridor options. However, due to the northern location of the route corridor it is considered to be more vulnerable to the impacts of climate change, such as landslides or flooding, due to the steep topography in the area.</p> <p>The route corridor study area is to the west of Loch Long from the A83 Trunk Road and heads west at Coilessan Glen to Lochgoilhead, before joining the existing B839. The route corridor rises from 10m to 100m over 2.2km on the west bank of Loch Long before rising steeply through Coilessan Glen to a peak of 500m before descending again steeply.</p> <p>As stated in the 'Water Environment' section, the route corridor is within a location that may be at risk of coastal flooding from Loch Long, Loch Goil and Loch Fyne and at fluvial flood risk from River Croe, Coilessan Burn, Donich Water/Ailt Coire Odhair, River Goil/ Ailt Clinne Mhoir, Ailt Glinne Bhig and Kinglas Water during a medium likelihood event.</p> <p>There are significant areas of forestry in the corridor study area, including Coilessan Glen and Ardgail Forest. As described in the 'Soils' section, there are large areas of peat soils in the corridor study area. Forestry area and peat lands have high carbon sink value.</p>

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	Material Assets	<p>Natural material assets within the route corridor include coniferous plantation woodland, which covers most of the offline section of the corridor and the lower slopes of the sections following the existing road networks. As indicated in the Soils section, there is presence of peat soils in the route corridor. Forestry areas and peat soils have high carbon sequestration and sink value.</p> <p>Due to the rural nature of the route corridor location, there are few built material assets. The route corridor intersects Local Authority 'A' 'B' and 'C' roads.</p> <p>The closest commercial waste disposal facility to the route corridor is located in Helensburgh to the south.</p>
	Cultural Heritage	<p>There are 16 designated cultural heritage resources within this route corridor. Twelve of these are Listed Buildings. These include clusters of Listed Buildings on the B828 at Pole Farm and at Lochgoilhead. There are three Scheduled Monuments within the route corridor: two are near the junction between the A83 Trunk Road with the B839 and the other is at Gleann Beag / Hell's Glen. The Ardkinglas and Strone GDL occupies a large extent of the route corridor at its northern end.</p> <p>There are no other designated cultural heritage resources within the route corridor, but there is potential for undesignated or undiscovered cultural heritage resources (e.g. archaeological remains) to be located here.</p>
	Landscape and Visual Amenity	<p>The route corridor is approximately 19km long. Starting at Cairndow coastal hamlet on the north-eastern shores of Loch Fyne the route corridor follows the existing A815 parallel to the loch for a short distance before turning south-east along the B839 and Hell's Glen then south along the river Goil until the village of Lochgoilhead. It then runs along Coilessan Glen and Loch Long to the hamlet of Ardgartan where it joins the A83 Trunk Road.</p> <p>Approximately 13 km of the south-eastern part of the route corridor is located within the LLTNP. The majority of this section of the route corridor is also located within Argyll Forest Park. The remaining north-western part of the route corridor is located within the North Argyll Area of Panoramic Quality (APO). The route corridor also passes through Ardkinglas and Strone Garden and Designed Landscape (GDL). There are no National Scenic Areas or Wild Land Areas within this route corridor, although there are small areas characterised by a degree of wildness on the slopes of The Brack (787m above ordnance datum).</p> <p>This route corridor is located within the Rugged Mountains Landscape Character Type (LCT), Steep Ridges and Mountains LCT, Steep Ridges and Hills LCT, Upland Glens - Loch Lomond &amp; the Trossachs LCT, Straths and Glens LCT,</p>

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		<p>Settled Coastal Fringe LCT and Highland Summits LCT. There are also three Seascape Character Areas (SCAs) within the route corridor: Loch Fyne - Inveraray to St Catherines SCA, Loch Goil - Head of Loch Goil SCA and Loch Long - Shepherd's Point to Coileissan SCA.</p> <p>Land cover within the corridor for this route option comprises sea and freshwater lochs and coastland, open grassland and moorland, native woodland, coniferous forestry and numerous watercourses. There are multiple large areas of coniferous forest plantation, small pockets of native woodland and several areas of Ancient Woodland in the eastern, central and western sections of the route corridor. In addition, the LLTNP Trees and Woodlands Strategy (2019) identifies several areas in the central and eastern parts of the route corridor as preferred or potential native woodland creation opportunities, while the Argyll &amp; Bute Council Woodland and Forestry Strategy (2011) identifies additional potential (but not preferred) areas for woodland/forestry creation on the eastern shores of Loch Fyne. With the exception of the small town of Lochgoilhead, settlement is sparsely scattered.</p> <p>One of Scotland's Great Trails, the Loch Lomond and Cowal Way, numerous core paths and several hill walking trails are located within this route corridor. Parts of the corridor would also be visible from sections of Loch Long, Loch Goil and Loch Fyne coastline as well as nearby hill walking summits and residential receptor locations.</p>
Traffic		<p>Annual average daily traffic (AADT) flow levels on the A83 Trunk Road in 2019 were 2,300 vpd (vehicles per day) on the stretch between Campbeltown and Tarbert and 4,400 vpd west of Tarbet, with the HGV percentage between 5% and 9%. At the Rest and Be Thankful, A83 Trunk Road traffic volumes were in the order of 4,500 vpd in 2019, with the HGV percentage around 9%, suggesting that, on average, around 400 HGVs pass through Glen Croe, on a daily basis. Additionally, around 17% of average daily traffic in 2019, on the A83 Trunk Road within Glen Croe (approximately 800 vehicles) was a light goods vehicle. Approximately 100 buses and coaches per day passed through Glen Croe via the A83 Trunk Road, in 2019.</p> <p>AADT flow levels on the A815 south of Cairndow were 2,000 vpd in 2019, with the HGV percentage in the order of 8%.</p> <p>Travel routes to/from, and within, Argyll &amp; Bute are highly seasonal, with greater volumes of people movements within the region during the summer months (predominantly as a result of increased visitor levels). Due to the geography and topography of the region, seasonal fluctuations in traffic volumes and the presence of slow-moving</p>

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	vehicles, travel times via the A83 Trunk Road between the key main towns/cities can be long relative to the distances involved and unreliable.
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Implementability		
Engineering	Topography and Alignment Considerations	<p>The topography from the north-eastern extents along Loch Long and into Coilessan Glen should allow for desirable minimum alignment geometry to be achieved; however, as the side slopes are steep this will require sections of cutting/ embankments to accommodate the carriageway.</p> <p>Through Coilessan Glen, the topography is challenging making it very difficult to achieve desirable minimum alignment geometry at or near existing ground level. The use of numerous switchbacks, likely sub-standard, in combination with deep cuttings and high embankments would be needed to provide an open road alignment. The provision of a tunnel would allow for desirable minimum geometry to be achieved.</p> <p>From Lochgoilhead going north, generally compliant alignment geometry can be achieved; however, a sharp change in vertical elevation over a short distance into Hell's Glen will require switchbacks likely resulting in a sub-standard alignment. A viaduct structure could help overcome this issue by utilising the existing topography further south.</p> <p>Heading west though Hell's Glen, compliant alignment geometry should be achievable through the use of cutting and embankments; however, further to the west the topography rises quickly into a saddle. Again, without the use of switchbacks or extensive earthworks, it is unlikely that a compliant vertical alignment can be achieved. A tunnel could be used to pass through the saddle emerging at Loch Fyne where the route ties into A815.</p> <p>For the A815, both the vertical and horizontal alignment geometry is generally expected to be compliant; however, the existing bend in advance of the junction with the A83 Trunk Road is estimated to be sub-standard with challenging topography adjacent limiting the potential for improvement. A viaduct structure bridging the gully at Cairndow would resolve this issue.</p>
	Geology / Geomorphology Considerations	The National Landslide Database records landslides to have occurred within the route corridor. It should be noted that additional landslides may have occurred which are not recorded within the database. Potential landslide hazards may require measures to protect any route alignment and this should be considered as part of detailed

		<p>assessment should this route corridor be retained. The database records landslides to have occurred at the following locations:</p> <ul style="list-style-type: none"><li>• One landslide on the western side of the saddle at the head of Coileissan Glen. The British Geological Survey (BGS) records mass movement deposits in association with this record.</li><li>• One landslide on the western slopes of The Steeple to the south-east of Lochgoilhead. The BGS records mass movement deposits in association with this record which extend into the route corridor, although any future landslide at the same location is considered unlikely to affect any road alignment within the route corridor due to the slope aspect and topography.</li><li>• Two landslides on Stob Liath. The BGS records mass movement deposits in association with these records which indicate the displaced material from one event moved towards the B839 in Hell's Glen, and the material from the other moved to the south-west, into the next glen.</li><li>• One landslide on Cruach nam Mult. No mass movement deposits are mapped in association with this record.</li><li>• One landslide on the north-facing slopes at the western end of Glen Kinglas close to the A815/A83 junction. The BGS records mass movement deposits in association with this record.</li><li>• One landslide on the south-facing slopes at the western end of Glen Kinglas. No mass movement deposits are mapped in association with this record.</li></ul> <p>Additionally, the local authority provided anecdotal evidence of localised, recurring landslide events on the A815, close to the junction with the A83 Trunk Road.</p> <p>Several landslides are recorded outside the boundaries of the route corridor but on the surrounding peaks. Those which are recorded on slopes facing towards the route corridor include landslide events on Cruach Fhiarach, The Brack and Cnoc Connich.</p> <p>Several landslides, some with associated mapped mass movement deposits are also recorded outside the route corridor boundaries on the south-facing slopes at the western end of Glen Kinglas, and on the west-facing slopes above Cairndow. A review of aerial photography reveals slope features indicative of further unrecorded landslide / debris flow scars along these slopes.</p> <p>An assessment of other potential issues including potentially difficult ground conditions is summarised below:</p>
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		<ul style="list-style-type: none"> <li>• The relatively low resolution of geological mapping in the eastern part of the route corridor in particular means that potentially hazardous deposits such as peat, alluvium and mass movement deposits may not be recorded.</li> <li>• Potential presence of soft or loose deposits (Alluvium, River Terrace Deposits).</li> <li>• Shallow rockhead and variability in rock strength due to the presence of igneous intrusions of high strength which may cause difficulties for shallow excavations and any tunnelled sections.</li> <li>• Faulting can create zones of weak and/or highly fractured rock which is a significant hazard when tunnelling or excavating cuttings. Conversely, faulting can also create zones of extremely strong 'welded' fault rock, which again would create difficulties for tunnelling or areas of cutting in relation to excavatability.</li> <li>• The presence of faults may provide a preferential pathway for groundwater flow, and groundwater may pose significant issues for excavation in cuttings and for tunnelling if the groundwater table is high.</li> </ul>
	Hydrology and Drainage Considerations	This is covered under 'Water Environment' in the 'Environment' part of this table.
	Structures Considerations	<p><u>Tunnels</u></p> <ul style="list-style-type: none"> <li>• Tunnels are considered to be required to satisfy a practical road alignment through the route corridor. The proposed East tunnel would be approximately 5.6km in length with a constant gradient of about 2.8% descending in a straight alignment from the west side of Loch Long in the east to a point north-west of Lochgoilhead in the west where the tunnel curves to the right to run into Glen Goil. The proposed West Tunnel would be approximately 2km in length with a constant gradient of 2.5% descending in a straight alignment from the south-east portal to the north-west portal, joining the A815 above Loch Fyne.</li> <li>• It is initially considered that the tunnels would be constructed as single bore providing a single carriageway with bi-directional traffic through the tunnels; however, there are important fire life safety, and associated ventilation and escape provisions, backed up by European and National highways standards that will govern the tunnel configuration.</li> <li>• For a single carriageway, bi-directional tunnel, these provisions are quite complex. The ventilation system must be in permanent operation and in the event of a fire, smoke and heat have to be removed from the tunnel using semi-transverse ventilation, which draws the smoke and heat into an overhead duct. In a long tunnel such as this, exhausts are likely to be required through intermediate shafts. Escape from the fire is also more problematic in that an escape duct has to be provided within the tunnel section. People trapped in</li> </ul>



the tunnel cannot be expected to be able to walk far through such a narrow duct, and so intermediate shafts or a parallel escape bore must be provided to facilitate escape to free air. Given the depth of intermediate shafts of 100m deep or more, lifts and a recovery suite at the shaft head would have to be provided. Alternatively, a parallel rescue bore could be constructed parallel to the main bore with enough space for rescue vehicles.

- Accordingly, twin bore, dual carriageway tunnels may be more appropriate. In such tunnels, in the event of a severe vehicle fire, longitudinal jet fan ventilation is ramped up to full strength to blow the smoke and heat in the direction of flow of traffic, away from vehicles queued behind the incident, while those ahead of the incident escape by continuing as normal. For those trapped in the tunnel, they can escape into the other non-incident bore through cross-passages, at say 100-150m intervals, and can be evacuated by rescue vehicles. Intermediate shafts would not typically be required other than to vent pollution.

#### Bridges

- 1 new 565m multi-span viaduct
- 1 new
- 5 new 20m single span composite concrete watercourse underbridges.
- 1 new 30m single span composite concrete deck watercourse underbridge on reinforced concrete abutments.
- 2 new 15m single span composite concrete deck accommodation road underbridges on reinforced concrete abutments.
- Approximately 16 new culverts.

The single span underbridges would comprise integral concrete precast Y beams with insitu deck slabs on reinforced concrete abutments or bankseats as required. Foundations would be spread footings or piled.

The multi-span viaduct would comprise a continuous composite steel box girder or composite concrete spine box deck on intermediate leaf piers and end bankseats. Foundations would be spread footing and/or piled.

Constructability, operation and maintenance in relation to structures are discussed elsewhere within the document.

	<p>Constructability Considerations</p>	<p><u>Major Structures Constructability Considerations - Tunnels</u></p> <ul style="list-style-type: none"> <li>• The tunnels could be advanced by drill and blast techniques or by using a large Tunnel Boring Machine (TBM).</li> <li>• Whichever technique is used, short sections of cut and cover tunnel would be required at each portal location to form a vertical portal face in reasonably competent rock from which the tunnel can be advanced. At each drill-and-blast advance the flat-bottomed “horseshoe”-shaped excavation of newly cut rock would be evaluated by a geologist, classified and strengthened using a pre-set combination of supporting elements (rockbolts and sprayed concrete, etc.), to form a stable primary lining before the next advance is drilled and charged with explosive. Although this may seem a slow and laborious process it can be an economic method to construct tunnels in rock. The tunnel can be completed more quickly if the drill-and-blast sequence can be repeated at the opposite portal, or even from intermediate shafts. Once the tunnel is completed an in-situ cast secondary lining can be installed to form a durable final structure.</li> <li>• Alternatively, the tunnels can be bored using a large Tunnel Boring Machine (TBM), starting at one end and boring the tunnel consecutively. Although this involves a large capital investment in a TBM and large site set-up at the portal locations, when compared with drill-and-blast, the final circular structural lining of pre-cast segments can be formed as the tunnel advances.</li> <li>• Where vertical ventilation or escape shafts are required, depending on the form of tunnel selected, there are locations along the Eastern tunnel alignment having significant shaft depths.</li> <li>• The western portal of the East Tunnel is sited in sloping forested terrain, so access could be difficult. At the western portal the hillside is steeply sloping but there appears to be some more level land in the vicinity, and access from Loch Goil is considered to be easier, particularly for a TBM.</li> <li>• The West tunnel has both portals on sloping ground, but it would probably be easier to establish a drive site adjacent to Loch Fyne due to the poor road connectivity and isolated location of the eastern portal.</li> <li>• The East tunnel is at significant depth below the mountain and construction of vertical shafts would be complicated by difficult access up steep slopes, particularly towards the eastern end where there are also limited existing access tracks.</li> </ul> <p><u>Other Constructability Considerations – Roads, Logistics and Small Structures</u></p> <ul style="list-style-type: none"> <li>• The single span underbridges would be constructed by conventional insitu construction of the abutments (piles where necessary) followed by installation of the precast Y beams and insitu deck topping. Access to the bridge sites would initially be by temporary haul road and/or would avail of the partially constructed</li> </ul>
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		<p>carriageway. Y beams would be delivered by road and lifted by small mobile cranes. Concrete delivery would be from site batching plant or ready-mix supplier.</p> <p>Western section (Cairndow to Lochgoilhead)</p> <ul style="list-style-type: none"><li>• The new road also crosses the existing B839 at several locations with sections of notable cut and fill for the new road. This would add to disruption on the B839 requiring diversions and possible closures to achieve construction, which could severely impact access to Lochgoilhead and other areas further south. Where possible it would be recommended to make improvement at grade or construct new road further offline to minimise the disruption caused and avoid needing to impose extensive diversions on existing roads or construct temporary roads around the works areas.</li><li>• Due to the minor nature of the available roads, an extended haul route will be required to transport materials and fill, this would also be needed to supply the viaduct construction at Monevechadan and the construction of the eastern portal of the tunnel.</li><li>• There may be an alternative option to close the B839 between Monevechadan and the A815 and divert traffic via the A83 and B828, as there do not appear to be any properties along this stretch of the B839 for which to maintain access.</li><li>• A marine facility at Loch Fyne would be an option to support construction of the tunnel from the western tunnel portal, as well as the new viaduct construction at Cairndow.</li><li>• Online improvements to the A815 from Cairndow to the western tunnel portal would require single lane closures with two-way traffic light control for the traffic management.</li></ul> <p>Eastern section (Lochgoilhead to Ardgartan)</p> <ul style="list-style-type: none"><li>• Densely forested and steep hillsides for the new road between Ardgartan and Coilessan will require extensive clearance to construct the new road and temporary haul routes. Earthworks road construction will need to proceed linearly whilst providing haul road access.</li><li>• Access for eastern tunnel portal works could make use of improved existing access roads at Coilessan which are very narrow currently, with the portal location being relatively inaccessible from existing roads.</li><li>• The western tunnel portal is located on the existing B839 so partial construction of the new B839 would be required to divert traffic away before commencing construction. The B839 is single lane bi-directional road with intermittent passing places which would be insufficient to manage earthworks and materials associated with tunnelling works from the western portal whilst still in use, so would require a separate haul route.</li></ul>
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		<ul style="list-style-type: none"> <li>Construction of the tunnel would likely require use of a marine logistics facility on Loch Goil or Loch Long to keep site traffic from using substandard single lane B roads. This would be connected by a dedicated haul road to the work fronts and may preclude construction from both portals concurrently. If tunnelling from one end, use of Loch Long may be favoured to separate the tunnel works from the improvements to the B839 and reduce potential impacts to the road network, although this will depend on feasibility of establishing the marine support facility and ability to provide suitable access to the work fronts whilst minimising disruption at Lochgoilhead if work is to commence from the western portal.</li> </ul>
<p>Environment Considerations</p>	<p>Biodiversity, Fauna and Flora</p>	<p>15.01ha of Glen Etive and Glen Fyne SPA falls within the corridor study area. There could be temporary and permanent habitat loss within the SPA. Disturbance to breeding golden eagle could occur during construction and operation, which would be a major negative environmental effect.</p> <p>198.40ha of Beinn an Lochain SSSI falls within the corridor study area. There could be temporary and permanent habitat loss within the SSSI, including the loss of designated features, tall herb ledge and upland assemblage, which would be a major negative environmental effect. Moderate negative environmental effects could also occur as a result of nitrogen deposition.</p> <p>All of Hells Glen SSSI (37.40ha) falls within the corridor study area. There could be temporary and permanent habitat loss within the SSSI, including the loss of designated features, bryophyte assemblage, lichen assemblage and upland oak woodland, which would be a major negative environmental effect. Moderate negative environmental effects could also occur as a result of nitrogen deposition.</p> <p>Upper Loch Fyne and Loch Goil MPA falls within the corridor study area in two locations, with 89.08ha within Loch Fyne and 5.60ha within Loch Goil. There could be temporary and permanent habitat loss within the MPA, including the loss of designated features burrowed mud and flame shell beds, which would be a major negative environmental effect. Moderate negative environmental effects could also occur as a result of run-off and release of sediment from construction works including chemical and hydrocarbon loads from accidental spillage.</p> <p>There are 47 parcels of woodland listed on the AWI within the corridor study area. This could result in the loss of nationally important and irreplaceable habitat, which would be a major negative environmental effect and could require compensation. Moderate negative environmental effects could also occur as a result of nitrogen deposition.</p> <p>There is potential for effects on terrestrial and aquatic species from construction activities, as follows:</p>

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		<ul style="list-style-type: none"> <li>• Disturbance from noise and vibration and light pollution.</li> <li>• Injury or mortality from vegetation removal, vehicle movements, or becoming trapped in uncovered holes and pipes during construction.</li> <li>• Fragmentation and loss of habitat suitable for shelter, foraging and commuting.</li> <li>• Changes in water flow conditions from runoff, or alterations to watercourses and groundwater.</li> </ul>
	<p>Population and Human Health</p>	<p>There is potential for localised minor noise and vibration effects on receptors within the route corridor during the construction phase. For example, noise nuisance and vibration caused by traffic and activities associated with construction works could result in general annoyance and/ or sleep disturbance for local residents within the settlements of Ardgartan, Ardno, Cairndow, Coileissan and Lochgoilhead. During the operation phase, there is potential for receptors within the route corridor to experience minor noise and vibration effects from increased vehicle traffic. It is uncertain at this stage whether noise and vibration impacts on those receptors would be major during construction and operation.</p> <p>There is potential for other minor effects on population receptors resulting from construction traffic. Increased traffic volumes and construction activities could result in diversions and affect journey lengths for both vehicle travellers and non-motorised users (NMUs).</p> <p>The route corridor would provide a new link between the A83 Trunk Road at Ardgartan and the A83 Trunk Road at Cairndow and potentially reduce the severity and/or incidence of severance issues. <b>The route corridor is expected to improve accessibility and connectivity with the central belt for those living, working, and travelling in the Argyll and Bute region, through increasing the reliability of the trunk road network.</b> It is also expected that the route corridor would provide greater accessibility to walking routes in the surrounding area, including Loch Lomond and Cowal Way, Ardgartan Peninsula Circuit and Coileissan Glen &amp; Shore Circuit, and hill-walking routes such as Cruach nam Mult, Stob an Eas, Stob Liath, Ben Donich, Cnoc Coinnich, The Brack and Cruach Fhianach. There is also potential for paths to be severed as a result of the route corridor, but the extent and significance of such impacts are uncertain at this stage.</p> <p>There may be land-take from properties required to facilitate the operation of the route corridor.</p> <p>There is also potential for air quality effects during operation which could affect human health; these are discussed further under Air Quality.</p>

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	Water Environment	<p>Construction within the route corridor and operational structures and discharges may impact the hydromorphology and surface water quality of approximately four Water Framework Directive classified river water bodies, three coastal water bodies and approximately 50-60 minor watercourses.</p> <p>SEPA Flood Maps (SEPA, 2020) indicates that the route corridor may be at coastal flood risk from Loch Long, Loch Goil and Loch Fyne and at fluvial flood risk from River Croe, Coilessan Burn, Donich Water/ Allt Coire Odhair, River Goil/ Allt Clinne Mhoir, Allt Glinne Bhig, and Kinglas Water during a medium likelihood event (0.5% Annual Exceedance Probability (200-year) event).</p> <p>Loch Fyne Shellfish Water Protected Area is within the study area and may be impacted by the route. There are Active Aquaculture Sites, CAR licenced fish farms and Classified Shellfish Harvesting Areas within the vicinity of the route corridor, which may be impacted.</p> <p>The route corridor passes in the vicinity of two surface water Drinking Water Protected Areas, which may be impacted.</p> <p>The potential impacts of construction and operation within the route corridor could result in significant negative effects on the water environment, subject to appropriate mitigation.</p>
	Soil	<p>The route corridor is assessed as having a minor negative or uncertain effect. This recognises the route corridor has the potential to avoid effects on Class 1 (nationally important and of high conservation value) peat but would unavoidably affect non-priority peatland and carbon-rich soils. Loss of existing commercial forestry, Land Capability for Forestry (LCF) Class F2 and F4, and land identified as 'preferred' within the LLTNP Authority Trees and Woodland Strategy is likely to be unavoidable within the route corridor.</p> <p>Mitigation is likely to be achievable to reduce the potential for major negative environmental effects.</p>
	Air Quality	<p>There is potential for localised air quality impacts on receptors within the route corridor during the construction phase: for example, dust generated from site activities and emissions from vehicular movements, which could result in annoyance for residents within settlements including Ardgartan, Coilessan, Lochgoilhead, Ardno and Cairndow.</p> <p>Part of the route corridor does not follow an existing route and would therefore introduce traffic-related emissions to the area (e.g. carbon monoxide, sulphur dioxide, particulate matter) during operation.</p>

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		<p>Although the existing air quality in the region is good, there are a number of settlements within the route corridor which could potentially experience negative air quality effects; however it is expected that these would be reduced through mitigation measures.</p> <p>Potential air quality impacts on ecological receptors are assessed under Biodiversity, flora and fauna.</p>
	Climatic Factors	<p>The route corridor is a combination of online upgrades and new offline carriageway. It starts at the A83 Trunk Road at Ardgartan where a new section of road will take the route south along the west of Loch Long to Lochgoilhead. The route then joins the B839 and generally follows the existing road network. During periods of extended rainfall, the route corridor could be at risk of landslides from slope instability. Climate change is expected to increase the frequency and intensity of extreme weather events which could impact the route.</p> <p>As indicated in the 'Water Environment' section, areas of corridor may be at existing coastal flood risk from Loch Long, Loch Goil and Loch Fyne during a medium likelihood event. The route corridor may be at existing fluvial flood risk from River Croe, Coileissan Burn, Donich Water/Allt Coire Odhair, River Goil/ Allt Clinne Mhoir, Allt Glinne Bhig and Kinglas Water during a medium likelihood event.</p> <p>As indicated in the Soils section, there are areas of peat soils that would be affected by the corridor, leading to its degradation and release of carbon and this is assessed as having a major negative effect. There are areas of forestry within the route corridor and any felling would release sequestered carbon and reduce the carbon sink value of forests within the corridor. As indicated in the Biodiversity section, this loss is expected to have a major negative environmental effect. Woodland and Forestry Strategy areas, including existing planted woodland, potential, preferred and sensitive sites, need to be considered in the route corridor selection process.</p> <p>As stated in the 'Material Assets' section, engineering solutions would be required to accommodate aspects of the various options being considered for the route corridor construction. The construction of two tunnels and bridges would have a significant amount of embodied carbon in material usage and emissions from construction activities. Release of carbon emissions to construct the scheme and for vehicles using during operation would have a cumulative impact on increasing atmospheric carbon concentrations, contributing to climate change.</p>
	Material Assets	<p>Due to the topography of the route corridor, significant engineering solutions would be required to achieve compliance, requiring large-scale works and material requirements. The route corridor is approximately 19km in length with a combination of offline and online upgrade works. Construction would require significant raw material</p>

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		<p>inputs and earthwork activities to construct the route corridor and this is assessed as having a major environmental effect from use of materials:</p> <ul style="list-style-type: none"> <li>• 1 new 565m multi-span viaduct</li> <li>• 5 new 20m single span composite concrete watercourse underbridges.</li> <li>• 1 new 30m single span composite concrete deck watercourse underbridge on reinforced concrete abutments.</li> <li>• 2 new 15m single span composite concrete deck accommodation road underbridges on reinforced concrete abutments.</li> <li>• Tunnel 1 length: approximately 5.6km</li> <li>• Tunnel 2 length: approximately 2km</li> </ul> <p>With regard to natural material assets, there are forestry areas within the route corridor. Any required felling for the corridor option would result in loss of biodiversity and carbon sequestration potential. As stated in the 'Biodiversity Fauna and Flora' section, this loss is expected to have a major negative environmental effect on woodland. As indicated in the Soils section, there are sections of peat soils that would be affected by the corridor, leading to its degradation and release of carbon and this is assessed as having a major negative environmental effect.</p>
	Cultural Heritage	<p>Due to the clusters of cultural heritage resources within the route corridor and the large area of GDL at the northern end of the route corridor, significant negative impacts on cultural heritage are predicted. Any alignment within the corridor would need to avoid impacts on the GDL and the clusters of Listed Buildings and Scheduled Monuments. There is also potential for construction works and tunnelling to damage unknown archaeological resources.</p>
	Landscape and Visual Amenity	<p>There is potential for significant adverse effects on the special qualities of the LLTNP, the North Argyll APQ, one GDL and the local landscape and seascape character and landscape elements including native and ancient woodland and forestry plantations due to the construction and operation of the carriageway, introduction of traffic and supporting infrastructure associated with the proposed East and West Tunnels, such as the tunnel vertical ventilation shafts, escape shafts and tunnel portals.</p> <p>There is also potential for significant adverse visual effects on local residential receptors including those in Cairndow, Lochgoilhead and Ardgartan, vehicle travellers using the existing roads and people on core paths, hill walking trails and the Loch Lomond and Cowal Way Scotland's Great Trail, as well as views from the Highland summits around the study area.</p>



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Traffic	Traffic Flows	Given the relatively minor connectivity changes provided by implementing this route corridor, changes in traffic levels are likely to be low, in terms of traffic reduction on the existing A83 Trunk Road through the Rest and Be Thankful. This route corridor is proposed to be constructed through a glen which currently has no route, therefore will introduce traffic to the area.
	Accidents	Minor reductions in transport related casualties could, potentially, be realised as a result of reductions in vehicle kilometres associated with fewer landslide induced road closures and the associated long diversion routes for strategic traffic travelling to and from Argyll & Bute. During periods of closure the new route would provide a shorter diversion route for trips to the south.
Operational Considerations		<p>From a Trunk Road operation perspective, the main operational considerations within the route corridor are the risk of flooding and/or landslides, based on the steep topography. The centreline of the route corridor has a maximum elevation of 500m above ordnance datum, with significant peaks to the north and south providing shelter. This means it is likely that snow accumulates within the route corridor during the winter months, with potential winter resilience operational issues.</p> <p>Tunnel Operations</p> <ul style="list-style-type: none"> <li>• There is a need for regular inspection and maintenance of such tunnels. A tunnel manager, tunnel safety officer and a tunnel design &amp; safety consultative group (TDSCG) must be set up early in the design process and continue through operation. The location and type of tunnel operations centre would need to be reviewed and investigated further, depending on the final location and length of tunnel provided.</li> <li>• A sufficient power supply will be required to allow operation of the tunnel ventilation system and any other systems, particularly those required in the event of an emergency incident.</li> <li>• The use of the tunnel by vehicles carrying potentially hazardous materials or dangerous goods (such as fuel tankers) is largely dependent on fire safety and ventilation and may require a tunnel ventilation system that allows for a larger design fire size. Dependent on the evaluation of risks, dangerous goods vehicles may need to be escorted through the tunnel in a convoy. It should be noted that a twin bore dual carriageway tunnel configuration is considered likely to result in fewer road traffic accidents (due to no bi-directional traffic flow), theoretically attracting a lower risk of emergency incidents.</li> <li>• For a twin bore dual carriageway configuration, vehicle crossovers may need to be provided at intervals if practicable, as per recommendation from the European Directive EUD 2004/54 EC. In addition, lay-bys should be provided at intervals.</li> </ul>

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	<ul style="list-style-type: none"> <li>The development of any tunnel design should be informed by consultation with emergency services and other relevant stakeholders and guided by European and National Standards to ensure that appropriately robust measures in the event of an emergency incident are put in place.</li> </ul>
Financial Considerations	The estimated cost range of a scheme within this route corridor is approximately £1.53Bn - £2.01Bn
Estimated Time to Completion	It is estimated it would take approximately 11 – 12 years to achieve a fully operational road in this route corridor assuming constructed as a single contract. If construction was phased with contracts in sequence, the time for completion would be greater.
Public Acceptability	The Coileissan Glen corridor was suggested in the responses received to the public consultation on the A83 Access to Argyll and Bute project. There is therefore no public opinion on this route corridor that can be included in this assessment.

STAG Criteria		
Criteria		Assessment Summary
Environment		Refer to Implementability Assessment – Environment
Safety		Refer to Implementability Assessment – Accidents
Economy	Transport Economic Efficiency	<p>This route corridor does not provide a significant change in connectivity for areas of Argyll &amp; Bute, when compared to the existing route, under normal operating conditions, and is unlikely to provide any significant benefits associated with journey time savings.</p> <p>A high-level cost-benefit analysis undertaken for the different route corridor options proposed suggests that, assuming normal operation of the existing A83 Trunk Road, the benefit to cost ratio for the proposed route corridor is expected to be very low. Quantification of the economic benefits of the scheme will require further analysis of the cost of closures to the economy.</p>
	Wider Economic Impacts	As a result of the enhanced resilience provided through mitigating landslide induced closures and, subsequently, increased business confidence and associated inward investment, this intervention is has the potential to provide a positive contribution towards wider economic impacts within the wider Argyll & Bute region.

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STAG Criteria		
Criteria		Assessment Summary
		<p>While this route corridor address issues with resilience, poor reliability and long journey times come about, not only because of issues with resilience at the Rest and Be Thankful. Even under normal operating conditions i.e. when the A83 Trunk Road is fully open to traffic, journey times for both strategic and local traffic using the A83 Trunk Road can be variable, due to slow moving vehicles and tourist/visitor traffic.</p> <p>The current road network and lack of suitable alternative routes inevitably mean that many areas would remain remote even if resilience issues at the Rest and be Thankful were overcome. This suggests that wider economic impacts, simply from removing the risks of landslides or A83 Trunk Road route closures, at the Rest and Be Thankful, may potentially be modest.</p> <p>It is also worth noting that, while rural depopulation (a significant issue within Argyll &amp; Bute) is linked to wider economic outcomes, indications are that headline economic conditions are not the main driver of this. Transport interventions could likely play a part in arresting population decline, but only if considered alongside an integrated package of economic, cultural and social regeneration measures. A package of measures of this type, coupled with upgraded access to Kintyre, Bute and Cowal, has the potential to arrest population decline and reinvigorate local communities within Argyll &amp; Bute.</p>
Integration	Transport Integration	<p>An integrated transport system aids accessibility by connecting people to opportunities and goods to markets. This route corridor may provide multi-modal opportunities to enhance transport integration.</p> <p>The intervention provides the opportunity to enhance linkages to walking and cycling routes and core paths. As part of the design process, it will be ensured that NMU facilities provided as part of the intervention address the needs of recreational walkers, cyclists and equestrians, as well as, to a more limited extent in this route corridor, commuters.</p> <p>The intervention will provide enhanced resilience and potential journey time reliability benefits for buses and coaches travelling via the A83 Trunk Road. In the context of providing reliable journey times, the length of improvement in the A83 corridor, compared to the overall corridor length, is small. Therefore, although corridor improvements at the Rest and be Thankful will make the route available more often, it will not necessarily provide a step change in overall journey time reliability. The resilience provided may</p>

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STAG Criteria	
Criteria	Assessment Summary
	<p>provide bus and coach operators with an opportunity to review timetables, translating to more efficient operations and, potentially, a change in service frequency and the number of communities served.</p> <p>Landslide induced incidents on the A83 Trunk Road at the Rest &amp; Be Thankful can lead to road closures and diversions. Should the Old Military Road also be closed, the diversionary route for A83 traffic between Tarbet and Inveraray is approximately 25 miles longer in length than if using the A83. Depending on journey origin and destination, the longest diversion length experienced by travellers would be over 60 miles. The improved resilience may contribute towards a reduction in the variability of bus journey times and the likelihood of full closures, leading to service cancellations. This may also provide a health and welfare benefit to bus drivers, due to the reduction in instances where bus services are forced to travel via longer diversion routes.</p> <p>This route corridor is not expected to have any material impact on the perception of a seamless public transport journey, as interchange and ticketing will not be affected to any great extent. However, interchange with bus services travelling on the A83, due to the reduction in cancelled or delayed services discussed above, may be more reliable.</p> <p>The intervention, through the enhanced resilience provided, will enable more efficient opportunities for freight transport, facilitating more efficient and effective transportation of goods of significant value to the regional and national economies, including high value aquaculture produce and whisky.</p>
Transport and Land Use Integration	<p>The main aspect of appraisal within the transport and land-use integration criteria is identifying and mitigating any conflicts between the intervention and land-use planning policy and environmental designations.</p> <p>If selected as the preferred route corridor, a strategic assessment of the impact of the route corridor on the environment would be carried out in the Strategic Environmental Assessment (SEA). More detailed Environmental Impact Assessment would be carried out as part of the DMRB Assessment Process.</p>

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STAG Criteria	
Criteria	Assessment Summary
	<p>The route corridor is expected to support enhanced accessibility to and from developments in the wider region, and may support investment decisions in Argyll &amp; Bute, more generally.</p>
Policy Integration	<p>The route corridor contributes to strategic policy objectives set by the Scottish Government and Transport Scotland. A wide range of national and regional level policies from various plans, programmes and strategies have been reviewed, including Argyll and Bute's Local Development Plan, its' Strategic Environmental Assessment and the LLTNP Local Development Plan. The various relevant policies contained within these documents have been taken into account in the TPOs, the existing corridor conditions and the implementability assessment. No over-riding conflicts have been identified and, in specific instances, the route corridor may contribute towards the delivery of specific policies.</p> <p>The A83 Trunk Road was identified in Transport Scotland's STPR as a route requiring network optimisation through route management and targeted investment. Transport Scotland's emerging STPR2 continues to appraise the need for investment in improved access to Argyll &amp; Bute.</p> <p>It is likely that this route corridor will contribute positively to the NTS2 vision and several of the underpinning priorities and outcomes, including 'takes climate action' and 'helps deliver inclusive economic growth'. Achieving positive outcomes against several of the priorities and outcomes, however, will be dependent on the quality and nature of the infrastructure provided, particularly related with the facilitation and promotion of travel via active modes.</p> <p>This route corridor is likely to contribute positively towards the NPF3 vision, in terms of delivering 'a successful, sustainable place', 'a low carbon place' 'a natural resilient place' and 'a connected place'. NPF3 recognises that Scotland's varied coast and islands have an exceptional, internationally recognised environment and notes the opportunity to secure growth from renewable energy generation as well as other key economic sectors including tourism and food and drink (of key importance to the regional economy). It is recognised that infrastructure investment, including improved transport links are required to bring employment, reverse population decline and stimulate demand for development and services in rural areas.</p> <p>This route corridor is likely to contribute positively towards key objectives as set out within Argyll &amp; Bute's</p>

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STAG Criteria	
Criteria	Assessment Summary
	<p>Local Development Plan. An intervention within this route corridor will likely assist in the improvement of:</p> <ul style="list-style-type: none"> <li>- Argyll and Bute’s connectivity, transport infrastructure, integration between land use, transportation and associated networks.</li> <li>- Argyll and Bute’s main towns and key settlements, as increasingly attractive places where people want to live, work and invest</li> <li>- the economic and social regeneration of smaller rural communities</li> <li>- the continued diversification and sustainable growth of Argyll and Bute’s economy, with a particular focus on sustainable assets in terms of renewables, tourism, forestry, food and drink, including agriculture, fishing, aquaculture and whisky production</li> <li>- addressing climate change impacts and reducing the region’s carbon footprint</li> </ul> <p>This route corridor is likely to contribute positively towards the strategic principles set out within the LLTNP Local Development Plan. An intervention within this route corridor will contribute to the National Park by aiding the delivery of ‘a successful, sustainable place’, ‘a low carbon place’, ‘a natural, resilient place’ and ‘a more connected place’.</p> <p>While the route corridor is likely to largely fit with policies related with transport based emissions, the nature of the construction and engineering activities required to deliver this route corridor are likely to result in significant emissions, on the basis of existing technologies. It is anticipated, however, that efficiencies in construction practices and the materials used, could be identified e.g. sustainably sourced materials, with a lower embodied carbon content. This would aid in ensuring that any emissions associated with construction activities are minimised, as far as practicably possible, making best use of advances in emerging decarbonisation technology.</p> <p>It is expected that the route corridor would be delivered in-line with measures, as set out within the Scottish Government’s ‘Update to the Climate Change Plan’ (2018 – 2032), and associated documents, including the emerging findings from the ‘Deep Decarbonisation Pathways for Scottish Industries: Research Report’ relating with the decarbonisation of industry, including the construction sector.</p>

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STAG Criteria		
Criteria	Assessment Summary	
		A further assessment of carbon, and opportunities for carbon reduction in design, would be considered in later stages of the project assessment process.
Accessibility and Social Inclusion	Community Accessibility	<p>It is considered unlikely that this route corridor would have any significant impact on public transport usage, reducing transport poverty or reducing reliance on private cars. This is primarily due to the nature of the route corridor and the areas within which it is located.</p> <p>There exists an opportunity, through the infrastructure provided, to positively impact on the level of active travel undertaken within the route corridor. While there is the potential for local trips to be made via active modes, and for additional trips to be generated resulting from increased use of the infrastructure provided by visitors and tourists, it is unlikely, however, that the future level of active travel trips within the corridor would be significant.</p> <p>This route corridor provides a potential opportunity for the provision of enhanced parking facilities, improving access to the scenic area within which the route corridor sits. This could provide enhanced access to the natural environment for those wishing to park and proceed via active modes.</p> <p>Potential enhancements in resilience provided as a result of mitigating landslide induced closures could aid community accessibility, through better, more reliable access to services, both locally and further afield</p>
	Comparative Accessibility	<p>Due to the rural nature of the Argyll &amp; Bute region, the distances between key towns and a lack of suitable public transport services (in some areas) car ownership levels are greater than the national average. Due to the current high dependency for travel by car, the scale of accessibility benefits that would be delivered to this main user group through delivery of an intervention within this route corridor include more reliable journeys to employment opportunities, recreation, education and health services located both within and outwith the region.</p> <p>Visitors and leisure users would also likely benefit from NMU infrastructure provided, linking to core paths, existing cycle networks, outdoor activities and viewpoints. The design of such infrastructure should ensure that local communities benefit fully from such facilities and are not adversely impacted by them.</p>

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STAG Criteria	
Criteria	Assessment Summary
	<p>Freight users may see health and wellbeing benefits from the enhanced resilience provided by this route corridor, with fewer closures resulting in the need for lengthy diversion routes, which can add a significant duration to journeys, contributing towards driver fatigue and stress. Given the rural nature of the region, journeys made using the A83, may already be several hours in length.</p> <p>Positive impacts can be expected, in terms of mitigating impacts on socially excluded groups - Argyll &amp; Bute has a higher proportion of older residents than the national average. Enhanced resilience may provide more reliable access to key services, including healthcare.</p> <p>This route corridor could contribute to reducing economic and geographic deprivation for currently socially disadvantaged groups (Argyll &amp; Bute has several areas within the 10% most deprived communities in Scotland) through the improvement of accessibility and the enhancement of business confidence driving an associated increase in inward investment and jobs.</p>



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Assessment Summary

Transport Planning Objectives		Assessment						
Objective		Major Negative	Moderate Negative	Minor Negative	Neutral	Minor Positive	Moderate Positive	Major Positive
TPO1	Resilience – reduce the impact of disruption for travel to, from and between key towns within Argyll & Bute, and for communities accessed via the strategic road network.						✓	
TPO2	Safety – positively contribute towards the Scottish Government’s Vision Zero road safety target by reducing accidents on the road network and their severity.					✓		
TPO3	Economy – reduce geographic and economic inequalities within Argyll & Bute through improved connectivity and resilience.					✓		
TPO4	Sustainable travel – encourage sustainable travel to, from and within Argyll & Bute through facilitating bus, active travel and sustainable travel choices.				✓			
TPO5	Environment – Protect the environment, including the benefits local communities and visitors obtain from the natural environment, by enhancing natural capital assets and ecosystem service provision through delivery of sustainable transport infrastructure.	✓						

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Implementability		RAG Rating		
		RED	AMBER	GREEN
Engineering	Topography and Alignment Considerations			
	Geology / Geomorphology Considerations			
	Structures Considerations			
	Constructability Considerations			
Environment	Biodiversity, Fauna and Flora			
	Population and Human Health			
	Water			
	Soil			
	Air Quality			
	Climate			
	Material Assets			
	Cultural Heritage			
	Landscape and Visual Amenity			
	Traffic	Traffic Flows		
Accidents				
Operational Considerations				
Financial Considerations				

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STAG Criteria		Assessment						
Criteria		Major Negative	Moderate Negative	Minor Negative	Neutral	Minor Positive	Moderate Positive	Major Positive
Environment		Refer to Implementability Assessment – Environment						
Safety		Refer to Implementability Assessment – Accidents						
Economy	Transport Economic Efficiency	✓						
	Wider Economic Impacts					✓		
Integration	Transport Integration				✓			
	Transport and Land Use Integration				✓			
	Policy Integration				✓			
Accessibility and Social Inclusion	Community Accessibility					✓		
	Comparative Accessibility					✓		