

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| Route Corridor Details | |
|------------------------------|--|
| Route Corridor Option | Route Corridor 12 – A82 – Inveruglas – Butterbridge |
| Route Corridor Description | This route corridor is off-line and generally heads west from the A82 Trunk Road at Inveruglas following Inveruglas Water across the mountain range towards the A83 Trunk Road at Butterbridge. The overall length of the route corridor is approximately 8.2 kilometres. The route corridor passes through similar terrain to that of the Rest and Be Thankful. Road structures and ground engineering measures would likely be required to fit the new road in the topography of the valley. |
| Rationale for Route Corridor | The A82 – Inveruglas – Butterbridge 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. For traffic travelling to/from the south this would also involve travelling along the A82 Trunk Road between Tarbet and Inveruglas. |
| 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 32-35 miles from the city of Glasgow. The eastern extent of the route corridor is situated at Inveruglas on the A82 Trunk Road. The western extent of the route corridor is situated at Butterbridge which is located between Cairndow and the Rest and Be Thankful on the A83 Trunk Road. The route corridor is located within the western extremities of the Loch Lomond and The Trossachs National Park (LLTNP). The route corridor joins the two aforementioned trunk roads and crosses the West Highland Line railway at the east extents next to the A82 trunk road. |
| Social Context | <p>Given the geographically remote nature of large areas of Argyll & 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 & 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 times to a selection of basic services such as schools, health services and retail centres. Forty-eight (38%) of Argyll and</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | |
|------------------|---|
| | <p>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 & 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 & Bute and the central belt. The lack of a reliable strategic route linking Argyll & 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 & Bute region could contribute towards increasing inward 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.</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| 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 & Bute and Mid-Argyll, Kintyre and the Islands, and for local traffic travelling to / from and between key towns and communities within Argyll & 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 & 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 & Bute. While the A83 at the Rest and Be Thankful is operating under normal conditions, this route corridor would see reduced travel distances for those trips to/from the region and the A82 north, and during periods of closure the new route would provide a shorter diversion route for trips to the south.</p> <p>In addition, once the improvements to the A82 Tarbet to Inverarnan section currently under development are implemented, this would result in safety benefits on this section of the trunk road network, which is known to have an accident history.</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 as the majority of traffic movements to/from the region are south towards Glasgow, therefore a corridor to the north does not benefit the</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|------|---|--|
| | | majority of users. The route corridor does, however, offer 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 8.2km long. |
| | Existing Roads | The route corridor intersects the A82 Trunk Road at its east extents and the A83 Trunk Road at its west extents. The route corridor does not intersect any Local Authority operated / maintained 'A' / 'B' / 'C' roads. |
| | Existing Accesses | A class road: 0 B class road: 0 C class road: 0 Unclassified road/direct access: 4 |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|--------------------------------|--|
| | | <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> |
| | <p>Topography and Land Use</p> | <p>The route corridor is rural in nature and ground levels along the centre of the route corridor rise steeply from the existing A82 Trunk Road at Inveruglas, climbing from approximately 30m to 170m above ordnance datum. This continues to rise to a highest point along the centre of the route corridor at 750m above ordnance datum between Beinn Chorrnach and Beinn Ime. The route corridor reaches this elevation over approximately 6.2km from the connection to the A82 Trunk Road at Inveruglas. On the western side of this saddle the elevation descends steeply to 180m above ordnance datum over approximately 1.8km to the connection with the A83 Trunk Road at Butterbridge. There are two settlements within the route corridor near the east end of the route both at approximately 120m above ordnance datum.</p> <p>Land use within the route corridor includes commercial interests in the form of properties at Inveruglas and mixed/coniferous plantation woodland on the south side of Inveruglas Water at the eastern end of the corridor. There is also evidence, based on available aerial imagery, of agricultural operations within the route corridor with an agricultural building and fencing approximately 1.8km from the A82 Trunk Road at Coiregrogain.</p> <p>There are several features within the route corridor associated with utilities and infrastructure; Loch Sloy, which is bound by a dam at its south-east end and fed by an extensive network of overground and underground infrastructure at both the northern and southern ends, and the Inverarnan 275/132kV Substation at the north-eastern extent of the route corridor. A pair of high voltage electricity transmission lines also cross the corridor to the west of Loch Sloy and a further high voltage electricity transmission line also runs along the route corridor from Loch Sloy to the aforementioned substation at Inverarnan. The West Highland Line railway passes through the route corridor and is located in land to the west of the A82 Trunk Road.</p> |
| | <p>Geology / Geomorphology</p> | <p>The route corridor passes west from the A82 Trunk Road at Inveruglas, along the valley of the Inveruglas Water. The southern slopes here are forested and relatively low height; they are relatively gentle except for those adjacent to the channel of the Inveruglas Water. The northern, unforested slopes are steeper, more irregular and rock is exposed in many places. The route corridor then enters the U-shaped valley between Ben Vane to the north and</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|--|---|
| | | <p>A'Chrois to the south; these peaks are steep sided with numerous rock exposures. Frequent channels are evident on the slopes of Ben Vane and A'Chrois, many of these are steeply incised and show evidence of material deposition on the lower slopes. This mountainous terrain continues into the upper valley to the masses of Beinn Ime and Beinn Chorrnach at its head. The route corridor passes over these peaks and joins the A83 Trunk Road just to the south of Butterbridge in Glen Kinglas.</p> <p>The superficial deposits mapping beneath the route corridor is of notably poor resolution. Glacial Till (diamicton) is recorded on the lower slopes of the valley to the west of Inveruglas while the upper slopes and mountain tops have no deposits recorded, indicative of thin or absent superficial deposits. Localised deposits of River Terrace Deposits are noted between Beinn Ime and Ben Vane, associated with the Inveruglas water near Coiregrogain and in the vicinity of Inveruglas. The western end of the route corridor displays more detailed mapping and deposits of Hummocky (Moundy) Glacial Deposits are recorded on the western slopes of Beinn Ime and the northern slopes of Beinn Luibhean in the vicinity of the A83 Trunk Road tie-in.</p> <p>No artificial ground is mapped within the route corridor; however, made ground is anticipated in association with the A82 Trunk Road, the A83 Trunk Road and existing minor roads within the valley.</p> <p>The proposed route corridor is underlain by Dalradian metamorphic rocks of the Southern Highland Group, comprising predominantly psammites, 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. An extensive igneous intrusion of diorite belonging to the South of Scotland Granitic Suite is recorded between Beinn Ime and A'Chrois. Smaller areas of granitoid rock and igneous Breccia are also recorded in association with this intrusion.</p> <p>Several igneous dykes are recorded in the north of the route corridor; orientations are variable but are mostly east to west or northeast to southwest.</p> <p>There are several faults recorded in the east of the route corridor, between Inveruglas and A'Chrois. These predominantly trend north to south. A further regional scale northeast to southwest fault is recorded along the Kinglas Water between Beinn Chorrnach and Stob Coire Creagach to the northwest. This fault is mapped approaching the western tie-in and a possible continuation is mapped further to the southwest. Strata in the vicinity of the western tie-in to the A83 Trunk Road may be faulted as a result.</p> |
|--|--|---|

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|-------------|-------------------------------|--|
| | | <p>Historical ground investigation (GI) is recorded along the A82 Trunk Road; however, the exploratory holes were shallow and did not record the depth of bedrock. No further GI is recorded along the route corridor.</p> <p>References:</p> <ul style="list-style-type: none"> • British Geological Survey, Geological Survey of Scotland, 1:63,360/1:50,000 geological map series. Accessed via BGS maps portal https://www.bgs.ac.uk/information-hub/bgs-maps-portal/, October to December 2020. • British Geological Survey, Onshore GeoIndex, https://mapapps2.bgs.ac.uk/geoindex/home.html, 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. • British Geological Survey, The BGS Lexicon of Named Rock Units, https://webapps.bgs.ac.uk/lexicon/home.cfm. Accessed October to December 2020. |
| | Hydrology and Drainage | This is covered under 'Water Environment' in the 'Environment' part of this table. |
| | Structures | There are no existing structures in the route corridor. |
| Environment | Biodiversity, Fauna and Flora | <p>The route corridor passes through Glen Etive and Glen Fyne Special Protection Area (SPA) and Ben Vorlich Site of Special Scientific Interest (SSSI). Beinn a Lochain SSSI is located approximately 0.07km west of the corridor study area at the closes point.</p> <p>There are 13 parcels of woodland listed on the Ancient Woodland Inventory (AWI) within the route corridor.</p> |
| | Population and Human Health | The route corridor is rural in nature, with residential receptors located within the settlement of Inveruglas, and a further two residential receptors located elsewhere in the route corridor. |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-------------------|--|
| | | <p>Two long distance walking paths (Three Lochs Way and Loch Lomond and Cowal Way) follow the same route through the eastern extents of the route corridor, travelling north-west through Ardgartan Forest to Coiregrogain, before travelling east towards Inveruglas.</p> <p>Glen Loin Loop, a forest walking route, also passes through the route corridor, following the perimeter of A' Chrois in a north-westerly direction towards Gleann Leacann Sheileach where it crosses the stream before travelling east along the foot of Ben Vane. The route then joins the long-distance walking paths of Three Lochs Way and Loch Lomond and Cowal Way at Coiregrogain, where it travels south through Ardgartan Forest and exits the route corridor.</p> <p>There are also several Munros, Corbetts and mountains popular with hill-walkers within the route corridor, including Ben Vane, Beinn Chorrnach, Beinn Ime, A' Chrois, Creag Tharsuinn and Beinn Luibhean.</p> |
| | Water Environment | <p>The route corridor crosses or is in the vicinity of four river water bodies classified under the Water Framework Directive, including Loin Water, Allt Coiregrogain, Inveruglas Water and Kinglas Water. The corridor also contains approximately 30-40 minor watercourses.</p> <p>SEPA Flood Maps (SEPA, 2020) indicates that the route corridor may be at existing fluvial flood risk from Inveruglas Water, Allt Coiregrogain 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. There are no Shellfish Water Protected Areas, Active Aquaculture Sites, CAR licenced fish farms and Classified Shellfish Harvesting Areas within the vicinity of the route corridor. The route corridor passes through one surface water Drinking Water Protected Area. No bathing waters are in the vicinity of the route corridor.</p> |
| | Soil | <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 prominent in the eastern section of the corridor around Inveruglas.</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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-------------|--|
| | | <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) on the western slopes of Ben Vane and in the valley between Beinn Chorrnach and Beinn Ime. 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 the valley between Beinn Ime and Beinn Luibhean and adjacent to either side of Kinglas Water to the west of the route corridor. 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.</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 F6 (Land with very limited flexibility for the growth and management of tree crops) and Class F7 (Land unsuitable for producing tree crops) with some areas of Class F5 (Land with limited flexibility for the growth and management of tree crops) located towards the eastern and western boundaries of the route corridor. There are existing strands of commercial forestry located to the east of the route corridor.</p> <p>The study area includes land identified in the LLTNP Authority Trees and Woodland 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 to the east of the corridor on the lower slopes of Ben Vain and to the north of Inveruglas water. Other areas are identified as 'potential' (where native woodland creation would contribute to the wider strategy's objectives) throughout the route corridor.</p> |
| | Air Quality | <p>The route corridor is rural in nature; receptors sensitive to changes in air quality are present within the settlement of Inveruglas located partially within the eastern extent of the corridor, and at the two other buildings identified within the route corridor.</p> <p>There are no Air Quality Management Areas (AQMAs) in the route corridor or in the Argyll and Bute council area and current and past annual assessments suggest that it will be very unlikely to be necessary to declare any AQMAs in the future based on current air quality objectives (Argyll & Bute Air Quality Annual Progress Report, 2020).</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-------------------------|--|
| | | <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> |
| | <p>Climatic Factors</p> | <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. The topography of the corridor study area rises steeply from the centreline, climbing from approximately 30m to 170m. This steep slope continues to reach the highest point at 750m above the valley floor between Beinn Chorranch and Beinn Ime.</p> <p>The route corridor is within a location that may be at existing fluvial flood risk from Inveruglas Water, Allt Coiregrogain and Kinglas Water during a medium likelihood event, as stated in the 'Water Environment' section.</p> <p>There are areas of forested land in the corridor study area, particularly in the eastern section of the corridor. As described in the 'Soils' section, peaty podzols are the predominant soil type within the route corridor. These areas of forestry and peat soils have a high carbon sequestration and sink value.</p> |
| | <p>Material Assets</p> | <p>The corridor is located in a rural environment where the trunk road network plays an essential role in enabling mobility in the Argyll and Bute region. The route corridor is offline, west from the A82 Trunk Road, and follows the Inveruglas Water.</p> <p>There are natural material assets visible in the route corridor, including mixed/coniferous plantation woodland to the south of Inveruglas Water at the eastern extent of the corridor. There is evidence of agriculture from aerial imagery within the route corridor study area, approximately 1.8km from the A83 Trunk Road.</p> <p>There are several built material assets in the corridor associated with utilities, including a high voltage electricity transmission line to the west of Loch Sloy and a second line that runs along the corridor from Loch Sloy to a substation at Inverarnan. At the eastern extent of the corridor, the Sloy power station is located adjacent to the A82 Trunk Road at Inveruglas. The West Highland Line railway also passes through the route corridor and is located in land to the west of the A82 Trunk Road.</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-------------------------------------|---|
| | | <p>The closest commercial waste disposal facility to the route corridor is located in Helensburgh to the south.</p> |
| | <p>Cultural Heritage</p> | <p>There is only one designated cultural heritage resource within this route corridor, a Category A Listed Building north of Inveruglas. However, there are a cluster of other Listed Buildings (Categories A and C) immediately east of the route corridor, and Inveruglas Castle Scheduled Monument is in Loch Lomond, east of Inveruglas.</p> <p>There are no other designated cultural heritage resources within route corridor, but there is potential for undesignated or undiscovered cultural heritage resources (e.g. archaeological remains) to be located here.</p> |
| | <p>Landscape and Visual Amenity</p> | <p>The route corridor is approximately 8.2km long and is situated between the hamlet of Inveruglas on the western shores of Loch Lomond and Butterbridge in Glen Kinglas and lies entirely within the LLTNP. Approximately 1km of the eastern end of the route corridor is located within the Loch Lomond National Scenic Area (NSA). There are no Wild Land Areas within the route corridor, however, the western and northern parts of the route corridor are characterised by steep landform and a considerable degree of wildness, remoteness and tranquillity. This route corridor is located mainly within the Highland Summits Landscape Character Type (LCT) with small sections also located within Straths and Glens with Lochs and Upland Glens - Loch Lomond & the Trossachs LCTs.</p> <p>There are several existing tracks in the eastern and central part of the route corridor, providing access to the commercial forestry plantation and the Loch Sloy dam. There are no existing roads or tracks or other large-scale man-made elements in the western part of the route corridor (which passes between the Arrochar massif summits of Ben Vane, Beinn Narain and Beinn Ime) until the existing A83 Trunk Road and Glen Kinglas access track at the route corridor's western end.</p> <p>Land cover within the route corridor consists mainly of open grassland, moorland, rocky outcrops and numerous watercourses with small pockets of native broadleaved woodland in the east, including Ancient Woodland sites, a large block of young native pinewood to the west and a large area of commercial coniferous forestry along the Allt Coiregrogain in the east. This forestry plantation as well as the western edge of the route corridor are located within the Argyll Forest Park. In addition, the LLTNP Trees and Woodlands Strategy (2019) identifies large areas around the Highland summits as preferred or potential native woodland creation opportunities.</p> <p>Two of Scotland's Great Trails, Three Loch Way and Cowal Way, and a core path mainly along the same route are also located at the eastern end of the route corridor. Several hill walking trails are also located within this route corridor. Butterbridge, an old stone single arched bridge over Kinglas Water and a popular viewpoint, is located just outside the study area at the western end of the route corridor and the A83 Trunk Road in this location is part of the</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|---------|--|--|
| | | scenic Argyll Coastal Route. In the eastern section of the route corridor, LLTNP identifies another viewpoint on the path to Ben Vorlich via Loch Sloy, near a sub-station. |
| 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>Annual average daily traffic flow levels on the A82 Trunk Road to the north of Tarbet were 4,000 vpd (vehicles per day) in 2018, with the HGV percentage between 4% and 7%.</p> <p>Travel routes to/from, and within, Argyll & 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 vehicles, travel times via the A83 Trunk Road between the key main towns/cities can be long relative to the distances involved and unreliable.</p> |

| Implementability | | |
|------------------|---|--|
| Engineering | Topography and Alignment Considerations | Due to the topography within the full length of the route corridor being particularly challenging, it is not technically feasible to achieve desirable minimum alignment geometry at or near existing ground level. The use of numerous switchbacks, likely non-standard with respect to road design standards, in combination with deep cuttings and high embankments would be necessary to provide an open road alignment. The provision of a tunnel would allow for desirable minimum alignment geometry to be achieved. At the eastern extents of the route corridor, any potential route would also have to cross the West Highland Line railway. |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|---|--|
| | <p>Geology / Geomorphology Considerations</p> | <p>As noted above, it is likely that a fully tunnelled alignment would be required to achieve the desirable minimum alignment geometry within this route corridor. The following information on landslide records is provided for completeness; however, the provision of a tunnel would allow the assessment of, and potential mitigation against, landsliding to be limited to the vicinity of the portals and any open road sections. The summary of potentially difficult ground conditions includes considerations applicable to tunnelling.</p> <p>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 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"> • One landslide low on the slopes to the north-west of Inveruglas, this event was recorded as impacting the West Highland Line railway. • One landslide at the summit of A'Chrois on the southern margin of the route corridor. • Two landslides on the north-west slopes of Beinn Ime. <p>A review of aerial photography shows evidence of unrecorded landslide / debris flow scars along the north-west-facing slopes of A'Chrois.</p> <p>No mass movement deposits are mapped within this route corridor.</p> <p>An assessment of other potential issues including potentially difficult ground conditions is summarised below:</p> <ul style="list-style-type: none"> • The relatively low resolution of geological mapping means that potentially hazardous deposits such as peat, alluvium and mass movement deposits may not be recorded. • Potential presence of soft or loose deposits (River Terrace Deposits). • 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. • 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. |
|--|---|--|

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|---------------------------------------|--|
| | | <ul style="list-style-type: none"> 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. |
| | Hydrology and Drainage Considerations | This is covered under 'Water Environment' in the 'Environment' part of this table. |
| | Structures Considerations | <p><u>Tunnel</u></p> <ul style="list-style-type: none"> A tunnel is considered to be required to satisfy a practical road alignment through the route corridor. The proposed tunnel would be approximately 8.1km in length with a constant gradient of about 2.1% ascending in a fairly straight alignment from Inveruglas in the east to Butterbridge in the west. It is initially considered that the tunnel would be constructed by a single bore providing a single carriageway with bi-directional traffic through the tunnel; 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. 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 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 300m 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, a twin bore, dual carriageway tunnel 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 100-300m intervals, and can be evacuated by rescue vehicles. Intermediate shafts would not typically be required other than to vent pollution. |

| | | |
|--|---------------------------------|---|
| | | Constructability, operation and maintenance in relation to structures are discussed elsewhere within the document. |
| | Constructability Considerations | <p><u>Major Structures Constructability Considerations – Tunnel</u></p> <ul style="list-style-type: none"> • The tunnel could be advanced by drill and blast techniques or by using a large Tunnel Boring Machine (TBM). • 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. • Alternatively, the tunnel can be bored using a large Tunnel Boring Machine (TBM), starting at one end and boring the 8.1km of 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. • Where vertical ventilation or escape shafts are required, depending on the form of tunnel selected, there are locations along the tunnel alignment having significant shaft depths, particularly under Ben lme peak. At the eastern end the ground is more accessible so construction of vertical shafts could be achieved using the existing access roads, with necessary improvements, from the A82 Trunk Road at the eastern end of the tunnel. However, construction of shafts to the west end will be challenging due to severe access restrictions and steep slopes. • The construction of a portal at the eastern end of the tunnel adjacent to Inveruglas is likely to be problematic due to the proximity of existing properties and the West Highland railway line which crosses the tunnel portal area in a north-south direction. Tunnel construction works in this area would therefore involve significant interfaces with Network Rail with associated permissions, approvals and possessions. Alternatively, the portal might be able to be relocated to the north where there is more space. • Supporting construction from the A82 Trunk Road would not be desirable due to space restrictions on the road, with Loch Lomond providing limited opportunity for support due to being landlocked. Also, consideration of the possibility of upgrade works on the A82 Trunk Road needs to be made which could |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|----------------------------|-------------------------------|--|
| | | <p>stretch capacity of the road further. This would make it challenging to manage earthworks from the tunnelling operation, as well as delivery of plant and materials such as TBMs or precast tunnel segments, from the east end of the tunnel.</p> <ul style="list-style-type: none"> • The rail line may present a possible opportunity for establishing a rail supply siding, but this would require further investigation if the route option is selected. • Access may be preferred from the west end of the tunnel, via Loch Fyne and the existing A83 Trunk Road through Glen Kinglas. There seems to be a reasonable piece of flat ground in this location, where a tunnel site could be established. • At the western end the tunnel portal is located close to the existing A83 Trunk Road. To process and remove the earthworks material from the tunnel it will be necessary to utilise the A83 Trunk Road carrying road going tipper lorries, possibly to a marine facility at north end of Loch Fyne in Cairndow around 7km away, depending on the final location for the spoil. Alternatively, all spoil would need to be removed along the existing A83/A82 Trunk Roads which would increase traffic flows along the route and potentially leave the unsuitable material away operations vulnerable to landslip events. It may be possible to locate a temporary storage area on the west side of the A83 Trunk Road opposite the tunnel portal, which could be fed by conveyor and would allow the spoil removal operation to be managed to accommodate peak traffic or closure periods. This would have a further impact on the landscape in the temporary case. |
| Environment Considerations | Biodiversity, Fauna and Flora | <p>32.15ha of Glen Etive and Glen Fyne SPA falls within the corridor study area. There could be temporary and permanent habitat loss within the SPA, which would be a major negative environmental effect. Disturbance to the designated feature breeding golden eagle could occur during construction and operation, which would be a major negative environmental effect.</p> <p>15.14ha of Ben Vorlich SSSI falls within the corridor study area. There could be temporary and permanent habitat loss within the SSSI, including the loss of designated features alpine flush, subalpine wet heath and tall herb ledge, which would be a major negative environmental effect. Alterations to alpine flush, subalpine wet heath designated features could occur as a result of water flow changes, which would be a major negative environmental effect. Moderate negative environmental effects could also occur as a result of nitrogen deposition.</p> <p>Beinn an Lochain SSSI is located approximately 0.07km west of the corridor study area at the closes point. Moderate negative environmental effects could occur to tall herb ledge and upland assemblage, designated features of the SSSI, as a result of nitrogen deposition.</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|------------------------------------|---|
| | | <p>There are 13 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> <ul style="list-style-type: none"> • Disturbance from noise and vibration and light pollution. • Injury or mortality from vegetation removal, vehicle movements, or becoming trapped in uncovered holes and pipes during construction. • Fragmentation and loss of habitat suitable for shelter, foraging and commuting. • Changes in water flow conditions from runoff, or alterations to watercourses and groundwater. <p>During operation, there is potential for habitat loss and fragmentation for protected species as a result of tree and vegetation clearance and loss of irreplaceable AWI.</p> |
| | <p>Population and Human Health</p> | <p>There is potential for localised noise and vibration effects on receptors close to 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. During the operation phase, there is potential for receptors close to the route to experience noise and vibration impacts from 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 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 and A82 Trunk Roads and potentially reduce the severity and/or incidence of severance issues. 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. It is also expected that the route corridor would provide greater accessibility to walking routes in the surrounding area, including Glen Loin Loop, Three Lochs Way and Loch Lomond and Cowal Way, and hill-walking routes such as Ben Vane, Beinn Chorrnach, Beinn Ime, A' Chrois, Creag Tharsuinn and Beinn Luibhean. There is also potential for paths to be severed as a result of the corridor, but the extent and significance of such impacts are uncertain at this stage.</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-------------------|---|
| | | <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 which could affect human health; these are discussed further under Air Quality.</p> |
| | 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 and approximately 30-40 minor watercourses.</p> <p>SEPA Flood Maps (SEPA, 2020) indicates that the route corridor may be at fluvial flood risk from Inveruglas Water, Allt Coiregrogain and Kinglas Water during a medium likelihood event (0.5% Annual Exceedance Probability (200-year) event).</p> <p>The route corridor passes in the vicinity of one surface water Drinking Water Protected Area, 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 environmental effect. This recognises the route corridor has the potential to avoid effects on Class 1 (nationally important and of high conservation value) and Class 2 peat (nationally important and of potentially high conservation value and restoration potential) but would unavoidably affect non-priority peatland and carbon-rich soils. Loss of existing commercial forestry and land identified as 'preferred' in 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 of Inveruglas.</p> <p>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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|--|-----------------|---|
| | | <p>The existing air quality in the region is good, and with mitigation measures in place it is expected that any negative effects which do arise are likely to be minor.</p> <p>Potential air quality impacts on ecological receptors are assessed under biodiversity, flora and fauna.</p> |
| | Climate | <p>The route corridor is offline and has steep topography on either side of the centreline. 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, there are areas of the route corridor which may be at risk of fluvial flooding from Inveruglas Water, Allt Coregrogain and Kinglas Water. As the route corridor option is primarily a tunnel, negative effects from landslides and flooding at ground level would be avoided.</p> <p>As indicated in the 'Soils' section, there are areas peatland that could be affected by the corridor, leading to its degradation and release of carbon, although this is assessed as being a minor negative or uncertain environmental effect. There is also forestry on the route corridor. Any felling required would reduce the carbon sink value of forests within the corridor. Woodland and Forestry Strategy areas, including existing planted woodland, potential, preferred and sensitive sites, need to be considered in the corridor selection process. As the option includes a tunnel for almost the entirety of the route, loss of forestry and surface peat would be avoided, however deeper areas of peat may be encountered during tunnelling operations.</p> <p>As stated in the 'Material Assets' section, engineering solutions would be required to construct the tunnel, including significant material and earthwork requirements. Embodied carbon within materials and emissions released from construction activities would add to the cumulative atmospheric concentration of carbon, increasing climate change, likely resulting in minor environmental effects.</p> |
| | Material Assets | <p>The route corridor is offline west from the A82 Trunk Road and follows the Inveruglas Water. Due to the topography of the corridor, significant engineering solutions would be required to achieve compliance, requiring large-scale works and material requirements. The route corridor is approximately 8.2km in length and would require significant raw material inputs and earthwork activities to construct including:</p> <ul style="list-style-type: none"> • Total route corridor length: approximately 8.2km • Tunnel length: approximately 8.1km |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|---------|------------------------------|---|
| | | <p>As the option includes a tunnel for almost the entirety of the route, negative environmental effects on ground-based material assets would be avoided.</p> <p>The total length of the route corridor is approximately 8.2km, of which approximately 8.1km is a tunnel. Construction of this tunnel would have significant requirements for materials and earthwork treatment.</p> |
| | Cultural Heritage | <p>As there is only one designated cultural heritage resource within the route corridor (a Listed Building north of Inveruglas), no significant impacts on cultural heritage are predicted. However, any construction works or temporary access routes would need to avoid impacts on the Butter Bridge Listed Building immediately west of the route corridor. There is also potential for construction works and tunnelling to damage unknown archaeological resources.</p> |
| | Landscape and Visual Amenity | <p>This route corridor has the potential to result in significant adverse effects on the special qualities of the LLTNP and the Loch Lomond NSA, such as the high relative wildness, as well as the local landscape character and landscape elements including the rugged topography, watercourses, native and coniferous plantation woodland and Ancient Woodland sites due to the construction and operation of the carriageway and supporting infrastructure such as the tunnel vertical ventilation and escape shafts and tunnel portals.</p> <p>There is also potential for significant adverse effects on sensitive visual receptors on the nearby walking routes including the Three Lochs Way and Cowal Way (Scotland's Great Trails), LLTNP core path, the Arrochar Alps hill walking routes and the summit viewpoints on Ben Vane (the smallest but popular Munro in Scotland), Beinn Narain and Beinn Ime. There is also potential for adverse effects on the landscape setting and views of and from the old bridge at Butterbridge, on the LLTNP viewpoint on the path to Ben Vorlich via Loch Sloy and on views experienced by travellers on the Argyll Coastal Route.</p> <p>As the majority of the route corridor would need to be in a tunnel, the significance of the landscape and visual effects during operation would partially depend on the type of construction technique used, however it is considered unlikely that major significant adverse effects could be avoided.</p> |
| Traffic | Traffic Flows | <p>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. The majority of trips to/from the region are to the south towards Glasgow, rather</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | | |
|----------------------------|-----------|---|
| | | <p>than to the north on the A82 Trunk Road therefore this route corridor is not an attractive option for the majority of users.</p> <p>Should the A83 Trunk Road at the Rest and Be Thankful be closed to traffic, this route corridor would result in increases in the level of traffic using the A82 Trunk Road, north of Tarbet.</p> |
| | Accidents | <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 & Bute. While the A83 Trunk Road at Rest and Be Thankful is operating under normal conditions, this route corridor would see reduced travel distances for those trips to/from the region and the A82 Trunk Road north, and during periods of closure the new route would provide a shorter diversion route for trips to the south. In addition, this option includes improvements to the A82 Trunk Road Tarbet to Inverarnan section, which would result in safety benefits on this section of the trunk road network, which is known to have an accident history.</p> |
| 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 750m 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"> • There is a need for regular inspection and maintenance of such tunnels. A tunnel manager, tunnel safety officer and a tunnel design & 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. • 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. • 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 |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| | |
|------------------------------|---|
| | <p>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.</p> <ul style="list-style-type: none"> • 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. • 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. |
| Financial Considerations | The estimated cost range of a scheme within this route corridor is approximately £1.51Bn -£1.99Bn |
| Estimated Time to Completion | It is estimated it would take approximately 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 A82 – Inveruglas – Butterbridge route 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 | | Assessment Summary |
|---------------|-------------------------------|--|
| 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 & 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 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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | | |
|---------------|------------------------|--|
| Criteria | | Assessment Summary |
| | Wider Economic Impacts | <p>As a result of the enhanced resilience provided through mitigating landslide induced closures and, subsequently, increased business confidence and associated inward investment, this intervention has the potential to provide a positive contribution towards wider economic impacts within the wider Argyll & Bute region.</p> <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 & 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 & 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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | |
|------------------------------------|--|
| Criteria | Assessment Summary |
| | <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 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 & 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 cancelations. 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 | 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. |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | |
|--------------------|--|
| Criteria | Assessment Summary |
| | <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> <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 & 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 & 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</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | |
|---------------|---|
| Criteria | Assessment Summary |
| | <p>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 & Bute's Local Development Plan. An intervention within this route corridor will likely assist in the improvement of:</p> <ul style="list-style-type: none"> - Argyll and Bute's connectivity, transport infrastructure, integration between land use, transportation and associated networks. - Argyll and Bute's main towns and key settlements, as increasingly attractive places where people want to live, work and invest - the economic and social regeneration of smaller rural communities - 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 - addressing climate change impacts and reducing the region's carbon footprint <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</p> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | | |
|------------------------------------|---------------------------|---|
| Criteria | Assessment Summary | |
| | | <p>the emerging findings from the 'Deep Decarbonisation Pathways for Scottish Industries: Research Report' relating with the decarbonisation of industry, including the construction sector.</p> <p>A further assessment of carbon, and opportunities for carbon reduction in design, would be considered in later stages of the project assessment process.</p> |
| 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 & 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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
 Route Corridor Preliminary Assessment
 Route Corridor 12 – A82 – Inveruglas – Butterbridge

| STAG Criteria | |
|---------------|---|
| Criteria | Assessment Summary |
| | <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> <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 & 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 & 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> |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

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. | ✓ | | | | | | |

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

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

Access to Argyll & Bute (A83) Strategic Environmental Assessment & Preliminary Engineering Services
Route Corridor Preliminary Assessment
Route Corridor 12 – A82 – Inveruglas – Butterbridge

| 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 | | | | | ✓ | | |