

A83 Medium Term Solution
Options Assessment
OMR Interventions

Option Details	
Option	OMR (Old Military Road) Interventions
Option Description	<p>The OMR generally follows the route of the existing A83 Trunk Road, approximately 200m to the southwest of the A83 Trunk Road. It commences at the existing gated direct access, off the A83 Trunk Road, approximately 2.5km northwest of the Ardgartan Visitor Centre and re-joins the A83 Trunk Road at the Rest and Be Thankful carpark. The OMR consists of a relatively straight, flat section of road for approximately 2km before increasing gradients are introduced alongside winding hairpin geometry on the approach to the Rest and Be Thankful carpark.</p> <p>Following a review of the current operation and prevailing hazards, a number of discrete interventions are proposed to improve the operation and resilience of the OMR when used as a diversion route. The proposed interventions include an increased length of two-way working; providing edge protection where there is increased risk that a vehicle leaves the carriageway and would otherwise encounter a hazardous feature and edge markings for delineation of the road; curve widening to reduce risk of incidents on the tight bends; improved resilience of existing structures, including bridge upgrades to improve the operation of the road and potential strengthening works; improved resilience of culverts; potential realignment of the southern A83 Trunk Road /OMR junction to reduce flooding impacts; and geohazard mitigation measures for debris flows and boulder falls in the form of bunds and catch fences.</p> <p>The option has been developed as a package of discrete measures and could therefore be delivered as a whole or, alternatively, as a series of individual targeted interventions.</p>
Rationale for Option	<p>The OMR was identified as a viable diversion route for the A83 Trunk Road in the '<i>Study into Potential Emergency Diversion Routes at the Rest and Be Thankful</i>' report, published in 2012, and was brought into use shortly thereafter.</p> <p>The route currently provides a diversion route during closure of the A83 Trunk Road, where it is operated under a one-way convoy arrangement. Nevertheless, there have been a number of occasions where the OMR has also been closed or where operational issues have caused delays. The OMR Interventions have therefore been developed to improve the resilience and operation of the OMR when used as a diversion in the event the A83 Trunk Road is closed.</p> <p>As well as operating as the primary diversion route, it could also be developed to work in conjunction with the single lane forestry track option.</p>

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Project Objectives		
Objective		Performance against objective
1	Increase resilience of a temporary diversion route through Glen Croe by reducing the likelihood of it being closed during landslide, flooding and other incidents.	<p>The OMR Interventions option has been developed to provide targeted improvements to the OMR itself. The improvements have been derived based on an assessment of existing and potential problems with the existing OMR and address a range of issues. The interventions include alignment improvements to assist vehicle movements, structural assessment to ensure durability, and mitigation measures based on a geotechnical and flooding hazard assessment.</p> <p>Taken together, the interventions will increase the resilience of the temporary diversion route by helping prevent vehicle obstructions and accidents, avoiding structural failures and by providing targeted mitigation measures that will reduce the likelihood of flooding, debris flow or boulder fall closing the route.</p> <p>Whilst it cannot be guaranteed that the interventions will prevent closures in extreme events, they will reduce the likelihood and will help to minimise the impact of any such events by providing additional protective measures.</p>
2	Maximise operational benefits of a temporary diversion through Glen Croe route for all vehicles by providing a route that achieves a proportionate balance of time to implement, cost and impact.	<p>The OMR Interventions option could improve on the current diversion times by reducing the length of the route required to be operated under convoy. It will also improve some of the current pinch points which often cause incidents when vehicles fail to safely negotiate the route. The traffic management of the OMR to maximise the operational benefits will require agreement with the operating company.</p> <p>The hazard mitigation measures will also maximise the operational benefits by assisting in keeping the route open in events that may currently cause it to be closed.</p> <p>This option maximises the use of the existing assets of the OMR whilst improving reliability and journey times at a more modest construction cost and faster timescales compared to the Offline MTS options.</p>

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3	Reduce the likelihood of accidents on a temporary diversion route through Glen Croe.	The proposed alignment improvements have been developed based on an understanding of the risk areas during the current operation of the OMR as a diversion, targeting locations where there is sub-standard geometry and tight vehicle manoeuvres. The implementation of these geometric interventions will assist in reducing the likelihood of accidents at these same pressure points. The improved geotechnical and flood mitigation measures will also reduce the likelihood of vehicles being impacted by a weather-induced event.
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Implementability		
Engineering	Topography and Alignment Considerations	<p>The length of the OMR Interventions between the at-grade access with the A83 Trunk Road and the Rest and Be Thankful carpark is approximately 3.8km. This comprises approximately:</p> <ul style="list-style-type: none"> • 120m of junction realignment from A83 Trunk Road; • 798m of existing OMR one-way alignment; • 1,285m of widening to 2-lane on existing OMR alignment; • 1,400m of existing OMR one-way alignment. <p>Between the start of the option and the Rest and Be Thankful car park the centreline follows the existing OMR horizontally and vertically, with sub-standard horizontal curvature at steep gradients, highlighted by the hairpin bend at the northern section plus the tight bend at the bridge, and gradients up to 15%. Any improvement to the existing horizontal and vertical alignment to DMRB Standard on the northern section would require considerable engineering input.</p> <p>Along the valley floor, compliance with DMRB Standards is achievable. However, the rapid ascent at the northern end proves to be challenging without a significant engineered solution. The current proposal is to utilise the flatter, straighter alignment on the valley floor and increase the length of two-way working from 900m in length to 2,200m. Due to the prevailing straighter, flatter alignment this increase in road width has minimal effect on the overall footprint and would not require significant engineered solutions. The two-way working would taper back to existing road width before the northern steeper section begins, again minimising overall impact on the OMR.</p> <p>On the approach to the Rest and Be Thankful car park, the topography is particularly steep, and the horizontal curvature is particularly tight. Therefore, the proposal here is to introduce localised curve widening to improve turning angles for vehicles, particularly HGVs. This would require discrete sections of steep cuttings/retaining walls compared to a solution with full two-way working.</p>

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	Geotechnical / Earthworks Considerations	<p>From a geotechnical perspective, proposed improvements to the existing route, which include extending the two-way section, culvert and drainage improvements and widening localised sections of carriageway, are anticipated to be relatively straightforward. The proposed widening of Bridge B (approx. Ch. 2990m) to facilitate an improved swept path would require the existing soil nailed slope located immediately to the east to be reprofiled and extended, and the associated drainage channels realigned. It is anticipated that new earthworks to facilitate improvements would be relatively localised along the OMR and of a relatively small scale. Where new cuttings are proposed, geotechnical measures such as soil nails could be utilised to steepen soil cuttings to limit the lateral extent and height of the cutting slopes. Cuttings within rock may also be steepened subject to favourable conditions being present.</p> <p>Due to the relatively localised nature of the proposed improvement works, delivery of a detailed ground investigation to inform the design is anticipated to be relatively straightforward offering programme benefits in comparison to the alternative MTS options.</p>
	Geohazards	<p>In relation to geohazards, the location of the OMR on the lower slopes of Beinn Luibhean results in it being subject to a considerable geohazard threat, most notably debris flows, and landslide associated with the spreading failure located above the A83 Trunk Road, but also boulder fall. These slopes have already been subject to detailed assessment, and the anticipated nature and behaviour of such events has been modelled. From the results of the modelling, it is considered that provision of further geohazard mitigation measures would reduce the residual risk of disruption to the OMR over the project timescales. Additional geohazard mitigation measures, to augment the existing measures, are proposed above the A83 Trunk Road as part of the work currently being undertaken by BEAR. These mitigation measures would have the benefit of increasing both the resilience of the A83 Trunk Road and also the OMR below. Secondary protection measures are also likely to be required on the slope between the OMR and A83 Trunk Road. Mitigation measures may comprise debris flow barriers, rockfall attenuation barriers, rockfall catch fences, additional catch pits above the A83 Trunk Road and a strengthened and extended bund along the OMR in the vicinity of the spreading failure (approx. Ch. 1900 to 2300m).</p> <p>It is worth noting that there is scope for many of these mitigation measures, such as debris flow barriers, to be easily removed when they are no longer required if this is desired upon completion of the selected LTS route option. Similarly, bunds could be removed, and the footprint reinstated if they are no longer required. However, it should be noted that the residual threat to the OMR and lower slopes would increase as a consequence.</p>

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	Hydrology and Drainage Considerations	This is covered under 'Water Environment' in the 'Environment' part of this table.
	Structures Considerations	<p>There are a number of existing structures along the OMR. These include frequent culverts and a number of small structures across minor watercourses. These watercourses typically flow into the Croe Water or its tributaries. The three notable bridges on the OMR are: Bridge A (a recently constructed multicell culvert <10 years), Bridge B and Bridge C (both historic masonry arches). These are labelled going in the westbound direction with Bridge A being the most southern bridge present on the OMR. There are also a number of other structures associated with the ongoing construction of landslide mitigation measures which include debris flow fences, a large HESCO bund and small lengths of retaining structures to support earthworks adjacent to the OMR.</p> <p>It is not proposed that any of the small culvert structures be replaced or enhanced for structural reasons. However, some may need replaced for hydrological reasons and this is covered elsewhere.</p> <p>Bridge A currently has sufficient clearance between parapets to allow for a single lane of traffic. The proposed interventions are for this portion of road to be a carriageway with two-way flow of traffic. A number of relatively straightforward structural solutions are available including either the widening of the existing bridge or providing a temporary bridge to accommodate a separate south lane of traffic.</p> <p>Bridge B has sufficient width for a single lane of traffic. Whilst the current planned interventions are for a single lane of traffic at this location, the curve at the east of the structure requires widening after carrying out a swept path analysis. As a result, the structure requires widening to accommodate the swept path. The proposed widening is to the north side of the structure using a reinforced concrete portal structure, or similar, founded on rock. Geotechnical interventions will be required on the outside of the curve where the adjacent slope would be steepened. Refer to the geology section for further details.</p> <p>Bridge C does not require structural modification for the proposed interventions as there are no works proposed to widen the carriageway or alter road levels across Bridge C.</p> <p>All three bridges should have a structural assessment to confirm they are appropriate to carry normal traffic, 40 tonnes assessment live loading. Strengthening will be considered if the assessment determines that any structure is substandard in this regard.</p>

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	NMUs / WCHs	<p>The OMR interventions will not impact on The Loch Lomond and The Trossachs National Park (LLTNP) Core Path network as it is not classified as a core path.</p> <p>The proposed cross section has not included any NMU provision and would be unsuitable for NMU use when the OMR is being used as an emergency diversion route, as per the current situation.</p>
Constructability Considerations	Construction Sequencing & Methodology	<p>The construction sequence and methodology are likely to be much less complex compared to the other options based on the reduced scope. Works to widen the existing OMR and upgrade/widen structures/culverts is considered to be relatively straightforward and some of the works could be planned to be undertaken in the months when the risk of landslides events are less. It is not expected that these works would need to be carried out over a winter season. It is anticipated that the OMR would be handed over to the contractor to use and would become essentially an 'offline' construction. If there is a requirement to maintain use of the OMR for an emergency diversionary route during construction this will result in a slightly longer construction programme but could be possible. It may be that during construction only a single lane passage would be available on parts of the OMR, should it be needed as a diversion route. This will need to be risk assessed and managed by the contractor.</p>
	Control of surface water and protection of surrounding environment	<p>Control of surface water runoff will be easier than the other options simply because existing drainage infrastructure exists to deal with this. There will still be a need to implement water treatment solutions for polluted water created by the construction process to protect receiving watercourses, but these will be less in complexity and size than the other options due to less volume of water requiring processing. If needed the contractor could create a series of settlement ponds depending on the volume of surface water that is expected to enter the site if space permits.</p> <p>Depending on what option is taken forward for Bridge A, diverting or fluming the watercourse may be needed to facilitate the widening of this bridge. This is considered a standard method of construction and should not present any significant construction issues.</p> <p>Out of bank flow and flooding issues are considered, in more detail, in the Water Environment section of this table.</p>
	Site location	<p>The site location presents challenges for procurement of materials and resources. The remote location will result in an uplift in rates and attract a premium in general from the supply chain. The haulage routes and distance to nearest quarries will result in higher unit rates for import/export/haulage of material. Site accommodation for labour/staff may need to be considered due to the remote location and limited local available accommodation which could add further costs to the scheme.</p>

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	Logistics, access and working room	Access to the site contains substandard width roads and narrow structures but it is not expected that any abnormal loads would be needed to transport material to site. Working room throughout the construction phase will be limited if there is a requirement to maintain the OMR as an emergency diversionary route during construction. It is considered that appropriate working room would be made available for site compound setup, laydown areas and construction equipment to operate and manoeuvre safely.
	Earthworks Construction	The earthworks requirements are considered to be relatively straight forward for this option. The proximity to the A83 Trunk Road makes for easy access to the works for material import/export. The geotechnical solutions being proposed are not complex in nature and should present no significant issues for a contractor.
	Temporary Works	There is not considered to be any complex temporary works needed on this option. There may be a need to support excavations, temporary accesses for upslope works, standard formwork, creation of working platforms, temporary water diversions and surface water management however these are expected to be standard solutions.
	Health & Safety Risks (Construction)	<p>Due to the elevation of the site, weather risk is significant. Heavy, prolonged rainfall and snowfall present a risk to the contractor that will need managed and could add time to the construction phase. As the scope of works is relatively small, the bulk of the works could be undertaken in the better weather months (March – November) with a reduction of concurrent works in the winter months if needed.</p> <p>Other construction H&S residual risks include, working on steep ground in an active landslide risk zone, people/plant interface, access/egress, emergency access routes and control of temporary works. Standard temporary protection measures against flooding and landslide debris flows may be needed during construction to protect the workforce, works and equipment.</p>
Environment Considerations	Biodiversity, Fauna and Flora	<p>The floor of the Glen, adjacent to the Croe Water, includes grazed fields as well as wetland areas closer to the river. The wetland areas include floodplain vegetation generally dominated by sharp-flowered rush and/or purple moor-grass <i>Molinia caerulea</i>, in both acid and neutral forms. To the nearby west of the northern end of the online option, just south of the B828 Glen Mohr local road, there is a basin mire containing wet bog and fen vegetation. With the habitats along the OMR being largely grazed fields, the biodiversity is not considered to be high. There are some sporadic trees along the OMR which may be affected however the general habitat is not of high quality.</p> <p>The Croe Water itself is highly natural with (in the valley) a substrate of pebble/gravel and sometimes sand, riffles, pools, natural meanders and bank substrates/vegetation, and is highly likely to support salmonid fish species. Its tributaries in the immediate study area are small and mostly steep. The Croe Water is in 'Good' condition according to</p>

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		<p>the SEPA interactive water environment map. Given that the OMR crosses tributaries of the Croe Water, it would be important that these were adequately protected and not polluted.</p> <p>Otter <i>Lutra lutra</i> is highly likely to occur in the vicinity of the OMR, particularly along the Croe Water. The Preliminary Ecological Appraisal (PEA) survey confirmed presence of otter from spraints (droppings) in a number of locations along the Croe Water. Badger <i>Meles meles</i> is likely to be present at a lower density in this upland environment. The PEA surveys confirmed presence of badger from observation of a footprint by the Croe Water. The fields and other vegetation in the valley beside the Croe Water may support breeding waders. Given the location and nature of the habitat, other breeding birds in the vicinity of the OMR are likely to comprise common and widespread species. The OMR is likely to be sufficiently distant from the Croe Water not to cause any direct impact on the otter or badger population. Breeding bird habitat may be affected however general mitigation is likely feasible.</p> <p>In general terms, the route of the OMR is not in a sensitive ecological location and any improvement works are unlikely to have significant effects subject to relevant controls, particularly to reduce any water quality impacts.</p>
	<p>Population (land use and accessibility) and Human Health</p>	<p>There are a number of buildings along the route of the OMR with the majority of these being associated with agriculture (agricultural outbuildings). There are two residential properties along the route although they are not directly adjacent. The population base within the OMR area is very low. With this, impacts on human health is highly unlikely.</p> <p>The land to the west of the OMR and east of the Croe Water is currently largely agricultural, and indeed is a constrained corridor for agriculture. Any works to widen the OMR would reduce the extent available for agriculture. The land is classed as 6.2 within the Land Capability classification meaning it is not prime agricultural land and the evidence is that it is used for grazing.</p> <p>The OMR has historically been used for motorsport as a timed hill climb section. Remnants of the red brick start and finish locations are still evident on-site along the OMR.</p> <p>The OMR is known to be used by cyclists and walkers although it has no formal designation for either and is largely a private road. It is understood that many users travel in a loop around the OMR and the forest track after parking at the 'Rest and Be Thankful' car park. With there being no pedestrian/ cycling links proposed as part of the works, this function would be lost. As it is not a formal designation, this does not appear significant.</p> <p>The community assets largely relate to the use of the rural environment including hillwalks, the 'Rest and Be</p>

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		<p>Thankful' viewpoint, and a core path which runs through the forest on the western slope. These are unlikely to be significantly affected, although the visual impact from the viewpoint is considered in the Landscape and Visual Amenity section.</p> <p>The A83 Trunk Road is an important route for access in Argyll and Bute and its closure has a detrimental effect on local communities and businesses. The provision of an alternative route, over a short length, and without significant delay, would have a positive environmental effect for this alignment option.</p>
	Water Environment	<p>The OMR crosses the Croe Water and numerous minor watercourses as it traverses the valley. There are well defined lateral drains on the upslope side of the road which intercept run-off and then discharge to culverts carrying watercourses from the hillside above the OMR.</p> <p><i>Flood risk</i></p> <p>The Croe Water channel is close to the OMR between Chainage 0 and 700m. There is an area of flood risk identified in this area with the potential for regular flooding and disruption in as little as the 50%AEP (2-year) event. Detailed assessment of this area is underway to determine accurate flood extents and levels for a range of storm events. Potential solutions include bypassing this area with a new alignment of the A83 Trunk Road junction to avoid the area of regular flooding. Other options are raising the road vertical alignment or including a flood bund to prevent inundation, but these options have the potential to reduce floodplain storage and cause an increase in downstream flood risk.</p> <p>The standard of protection for the OMR is proposed at the 3.33%AEP (30-year) event based on the proposed operational timeframe of this medium-term solution. This provides a balance between avoiding flooding impacts and a proportionate level of upgrade to the assets such as culverts and bridges.</p> <p>There are a total of 36 watercourse crossings, including three bridge structures. Existing culvert diameters range between 450-900mm and some culverts are twin barrel structures, potentially due to the lack of cover to the road preventing upsizing of a single culvert to a larger diameter. The three main crossing structures are discussed above in detail and capacity and flood risk is covered in the following points:</p> <ul style="list-style-type: none"> • Bridge A crosses the Croe Water and is within an active alluvial fan zone with obvious paleochannels evident upstream and downstream of the road. Based on preliminary modelling the structure is currently estimated to have a capacity more than the 1%AEP (100-year) event and therefore does not require any changes from a

		<p>flooding perspective. Flows above this event are shown to overtop the OMR and may pose a significant risk to the road and embankment sections. Additionally, there is a risk of blockage of the twin box structure with larger boulders potentially being mobilised during higher flows and restricting the capacity of the structure. Post-storm event inspection is recommended to examine any changes to the capacity of the structure.</p> <ul style="list-style-type: none">• Bridge B crosses the watercourse at a significant height above the riverbed and is not considered to have any flood risk associated with it due to the relatively incised channel and elevation of the road above the channel bed.• Bridge C has an opening of 800mm and has limited freeboard to the road level, failing the freeboard capacity test. However, if this freeboard is discounted it has sufficient capacity to pass more than the 0.5%AEP (200-year) flow event. <p>The remaining 33 culverts are circular pipes. The following has been determined from an outline culvert capacity assessment:</p> <ul style="list-style-type: none">• 17 culverts pass more than the 0.5%AEP (200-year) flow including a 600mm freeboard to the road level• 5 culverts pass more than the 3.33%AEP (30-year) flow but less than the 0.5%AEP (200-year) flow• 11 culverts are undersized and require replacement or additional culverts to meet the required standard <p>Where possible the substandard culverts will be increased in diameter, or the number of pipes will be increased to convey the design flow. Where there are already multiple culvert barrels, box culverts will be considered to increase capacity at 4 locations.</p> <p><i>Hydromorphology</i></p> <p>Although a range of channel works is proposed the channels are relatively minor watercourses and have already been significantly altered by the OMR. The Option may result in relatively minimal increases to the extent of morphological pressures but also interventions provide the opportunity to improve sediment continuity by improving sediment conveyance through culverts. The Croe Water is a WFD classified water body, but no significant works are proposed in close proximity to the channel which would increase morphological pressures and the status is unlikely to be affected.</p>
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		<p>In addition to improving culvert capacity, it may be necessary to improve headwalls and inlet and outlet structures. Outlet structures may need improvement where there is a risk of destabilisation of the road embankment from fluvial erosion. Cascades and rock armour are the likely solutions that will be employed but the design of these structures is site specific and determined by the flow regime and gradient of the proposed structure and the ground conditions.</p> <p><i>Surface Water Quality</i></p> <p>Improvements to side of road drainage is proposed at Chainage 2410 to divert out of bank flows to the culvert and prevent flooding of the road. Similar improvements to side of road drainage may also be considered to help reduce the flow to culverts where viable. No SuDS are proposed but a level of attenuation and some limited treatment could be incorporated within the existing drains.</p> <p>Limited in-channel works resulting in some potential changes to water quality during construction or upgrade of culverts.</p>
	Soils	<p>There is likely to be a certain amount of made ground around the historic buildings along the OMR and also associated with construction of the OMR itself. The rest of the area is highly rural in nature with little evidence of historic land use outside of agriculture.</p> <p>There is no evidence of mineral quarrying or coal extraction in the area.</p> <p>The agricultural land has a Classification of 6.2 ('capable of use as rough grazing with moderate quality plants'). In terms of contamination, the land may have been affected by hydrocarbons from the use of the road and chemicals and waste associated with agricultural practices. There is evidence of some sheep dips in the fields.</p> <p>Given the modest intervention into the land either side of the OMR, it is unlikely that there would be significant effects on soils particularly given the land is not classified as prime agricultural land. The risks of soil contamination are relatively low given the highly rural location. Soil stability issues are more likely on the steeper slopes and as noted, intervention is needed which would have a localised detrimental impact.</p>
	Air Quality	<p>There are no Air Quality Management Areas (AQMAs) close to the OMR and there are no identified air quality issues in the area. The option is not expected to result in an increase in traffic and therefore it is not envisaged that air quality in the area would be significantly affected by the option.</p>

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	Material Assets	<p>The route corridor contains a variety of natural material assets. There are significant areas of forestry within the route corridor and as listed in the Soils section, there are peat soils present. The route corridor is located in a rural environment with few built material assets. The existing A83 Trunk Road is the main piece of infrastructure within the route corridor. The region contains several pieces of energy infrastructure, but none fall within the route corridor. There is a car park at the Rest and Be Thankful Viewpoint where the B828 Glen Mohr local road meets the A83 Trunk Road.</p> <p>The closest waste disposal facilities to the route corridor are approximately 25km to the south in Helensburgh.</p> <p>During construction, there will be a temporary impact on materials and waste. This is unlikely to be significant as rock is likely to be re-used either by use of the raw material or possibly sent to a local quarry (such as Clachan) for processing into useable fill material. The quantities of material required for this project would be less significant than the construction of full new road given this would involve only improvement works to the OMR. As no demolition is proposed, the waste created would likely only be from the construction process, though consideration would need to be given to suitably licensed disposal facilities.</p>
	Cultural Heritage	<p>The OMR itself is regarded as a cultural heritage asset. While it is not formally designated (the southern part is recorded as an undesignated asset), it has historical and cultural value given its age and historical purpose. Alterations to the OMR will therefore affect this historical asset. Alterations have already been made to the OMR at its southern extent, including widening, and resurfacing has recently been completed over the full length. Further widening of the OMR along the floor of the glen is unlikely to significantly affect the character of the OMR given the works to date. The main effect would be the improvements works needed on the hairpins and northern extents. Keeping the OMR to single lane for the final 1.5km will help retain most of its character, particularly as there are two historic bridges in this location and that the incline to the 'Rest and Be Thankful' forms part of the character of the OMR. The alterations on the incline and introduction of retaining walls however will create a detrimental impact on the character and setting of the OMR. Following completion of the Long-term scheme (LTS), such changes could potentially be reversed or the original alignment re-instated, to preserve the OMR's character.</p> <p>There are a number of cultural assets along the route of the OMR. These relate largely to its historic use and historic agricultural practices, although there is evidence of medieval settlement in the area. None of these are formally designated. The works have the potential to impact on these as some are relatively close to the OMR. This could potentially be avoided through localised design and as they sit adjacent to the OMR currently, it is not considered that the setting of these assets would be significantly affected.</p>

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		<p>The 'Rest and Be Thankful Stone' is Category C Listed. This is unlikely to be affected by the works and the setting would not be significantly impacted.</p>
	<p>Landscape and Visual Amenity</p>	<p>The OMR is located within the LLTNP which is considered a sensitive designation in the EIA Regulations. The 'Rest and Be Thankful' car park provides an important viewpoint across the whole of Glen Croe and sits elevated above the northern extent of the OMR. The viewpoint affords an almost unrestricted view of the entire OMR albeit the southern extent is at long distance. The landscape is rural in nature and gives the impression of being unspoilt and natural although there are modern interventions with the two roads, commercial forestry and sporadic buildings. The winding nature of the OMR, particularly at the northern extent, helps it fit better with the landscape as it follows the contours rather than using significant retaining measures.</p> <p>Views to the OMR are sporadic from the A83 Trunk Road and forest track on the western slope of Glen Croe. These views are intermittent as they sit higher than the OMR and views are obscured at times by trees and topography. More complete and stationary views are afforded from the surrounding mountains used by hillwalkers and the 'Rest and Be Thankful' viewpoint.</p> <p>The interventions to the majority of the OMR are likely to be discrete from a visual and landscape perspective with the widening over the most part unlikely to cause much change to the landscape. Where the widening occurs over topography changes or on corners, the visual impact is likely to be more discernible. The greatest visual and landscape impact would be from the need for retention on the incline near to the viewpoint. Direct views might not be possible from the viewpoint depending on where the retention is placed; however, if it is visible then it would be at close distance to the viewpoint. Views from the A83 Trunk Road would be possible to these measures as the topography and vegetation allows greater views in a northwest direction from the A83 Trunk Road, particularly at the point where landslips are common.</p> <p>The visual and landscape impacts would be significant but localised and may not be great when viewed in the larger context of the view of the Glen itself. Minimising the retaining works and using appropriate materials and design for the landscape would help reduce the impact.</p>
<p>Operational Considerations</p>	<p>How it operates</p>	<p>The OMR will become operational in times of closure of the A83 Trunk Road. It will operate under a 10mph convoy for the last 1.5km of the route up at the Rest and Be Thankful carpark due to the single lane carriageway. The remaining 2.2km will operate under two-way working with a 15mph speed limit.</p>

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		<p>Westbound traffic will be held on the OMR section with a two-lane carriageway just south of the taper to reduce to single lane carriageway. Proceeding up the route, the convoy vehicles will end at the Rest and Be Thankful carpark where they will re-join the westbound A83 Trunk Road carriageway.</p> <p>Eastbound traffic will be held on the A83 Trunk Road north of the A83 Trunk Road /B828 Glen Mohr local road junction and led down the OMR via the Rest and Be Thankful carpark. The convoy will end where the OMR widens from single lane to two lanes. Traffic can continue eastbound on the OMR and join the A83 Trunk Road at the existing A83 Trunk Road /OMR junction.</p> <p>It will be necessary to provide breakdown support with a large and small recovery vehicle on stand-by in case of an incident occurring on the OMR. This recovery vehicle should be stationed up at the Rest and Be Thankful carpark as it is noted from previous incidents that they mostly happen up near the A83 Trunk Road /B828 Glen Mohr local road junction where there are sharp hairpin bends and steep geometry.</p>
	Risk of Closure – Highways	<p>From a Highways perspective, the primary threat of closure is from vehicle breakdowns and / or traffic incidents. Flooding and surface water issues are also a threat.</p> <p>With 2.2km of the route operating under two-way working with a 15mph speed limit and the remaining 1.5km, with curve widening, operating under a 10mph convoy system, the likelihood of major traffic incidents is considered to be low.</p> <p>The likelihood of a vehicle breakdown is generally considered to be low. However, if there is a breakdown over the 1.5km length, operating under convoy, this could have a major impact on the route, with a temporary closure necessary until the vehicle can be recovered. A proposed recovery plan is outlined above in 'How it operates'.</p>
	Risk of Closure – Flooding	<p>There is a risk of closure from flooding at the junction with the A83 which can be mitigated through junction re-alignment. The OMR is free from potential flooding from the Croe Water up to a 30-year event, although there is very limited freeboard to the road in some locations in the lower section of the OMR. Closure due to fluvial flooding would be short (hours) due to the flashy nature of the catchment with peak flows subsiding quickly.</p>

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		There is the potential for surface water flooding and overland flow on the steep upper slopes and associated flows and debris causing a closure. Enhancements to the drainage network can reduce the potential for closure.
	Risk of Closure – Geotechnical / Geohazards	<p>It is considered that the OMR with additional interventions has a low likelihood of closure with any such closures of probably short duration.</p> <p>The amount of information available about the Beinn Luibhean slopes and the geohazard modelling undertaken to date have allowed a preliminary assessment to be carried out of the measures required to mitigate the geohazard threat to the route. It is considered that these measures will reduce the likelihood of geohazards impacting the OMR and in the event that any debris does reach the OMR, the extent of the impact and associated damage, and the associated clean-up time will be reduced.</p> <p>It is noted that the potential for catastrophic failure of the large spreading failure located above the A83 Trunk Road (approx. Ch 1900 to 2300m) has not been taken into account in the development of the RAG score or descriptors.</p>
	Safety	<p>The OMR is expected to operate under 10mph convoy for 40% of the route and a reduced speed limit set at 15mph for the remaining 60%. This will keep vehicle speeds low along its length which in turn should minimise the likelihood of incidents. Longitudinal edge markings are also proposed to help delineate the carriageway, particularly if operated in darkness.</p> <p>In the northern, steep section of the OMR there are existing steep downslopes creating a potentially significant hazard, even at slow speeds under convoy. As such, safety barrier is proposed along the steep sections of downslope to offer a level of protection. In the southern section under two-way working, the OMR is situated in relatively flat farmland where the risk is significantly reduced.</p>
	Journey Times	The journey time on the OMR has been calculated under two scenarios. The first scenario is where a vehicle arrives and does not have to wait for a convoy to continue their journey. The second scenario is where a vehicle arrives and has just missed the departing convoy. It is assumed that no vehicle would be left behind from the convoy if it had already joined the queue. As noted in the Scotland Transerv note, because of the length of time taken to travel the emergency route, it becomes untenable to operate if all the waiting traffic is not accommodated with each passing convoy because the delays suffered by drivers rise exponentially if not let through in the first convoy they meet. The

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		<p>assumed speed of the convoy on the OMR is 10mph and the signed speed limit on the two-way section of the OMR will be 15mph.</p> <p><u>Scenario 1</u> Time to travel the two-way section of the OMR (no convoy) = 5.5 minutes. Wait time = 0 minutes. Time to travel the convoyed section of the OMR = 6 minutes. Total travel time = 11.5 minutes.</p> <p><u>Scenario 2</u> Time to travel the two-way section of the OMR (no convoy) = 5.5 minutes. Wait time = 10.5 minutes. Time to travel the convoyed section of the OMR = 6 minutes. Total travel time = 22 minutes.</p> <p>The existing Scenario 1 journey time for the OMR diversion is 13 minutes.</p>
Financial Considerations	Capital	<p>An initial estimated cost estimate for the OMR Interventions is within the range of £24.3M-£31.9M at 2021 prices.</p> <p>This cost estimate currently includes approximate structures cost, value for bulk earthworks, prelims, preparation, land and supervision costs, non-recoverable VAT and optimism bias.</p> <p>Costs related to geotechnical hazard mitigation and drainage works have been estimated and also included. However, due to the preliminary nature of the design, exact costs cannot be confirmed, however it is likely significant costs will be required for these items due to the position of the OMR south of the A83 Trunk Road where there is significant risk of landslides.</p> <p>This cost estimate does not include any mitigation required on the A83 Trunk Road to reduce the hazard risk. However, the works to protect the OMR and improve resilience should be considered in tandem with ongoing mitigation works on the A83 Trunk Road.</p>

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	Operational	The OMR is proposed to run under convoy operation for the 1.5km northern section of the route where single lane carriageway is proposed due to difficult topography. This will incur an operational cost for one operating company team to manage the convoy during the times the OMR is in use. The operating costs should be similar to those currently incurred when the OMR is used as the A83 Trunk Road diversion.
Estimated Time to Completion	Implementation	If progressed as a whole, depending on a number of factors such as decision to proceed, land purchase, Ground Investigation, EIA Reporting and consultation requirements, this option has the potential to be open to traffic by summer 2024.
	Construction	No detailed construction programme has been prepared for this option, however, if delivered as a whole, it is expected that the overall construction duration for this option would be less than the MTS Offline and Forestry Track Upgrade options. Depending on the final scope of the works the duration could be anything up to 1 year.
Interface with FLS		The OMR has no direct interface with FLS managed woodland. At the southern end, the lower forestry track does join the OMR to connect back to the A83 Trunk Road, however that interface is south of the OMR junction with the A83 Trunk Road, therefore the proposals for the OMR interventions should not have an impact on FLS.
Consenting Considerations	Need for EIA	An assessment will be required to determine if an EIAR is needed. It is not certain that this will be required, although consideration will have to be given to the potential for significant effects within the LLTNP (a sensitive designation under the EIA Regulations), in particular considering the potential for significant landscape & visual effects.
	Need for 3 rd party land	The area where the OMR lies is partly in third-party land. Therefore, third-party land will be required by agreement or acquisition.
	Need for Orders	The need for Orders will be determined by Transport Scotland's preferred strategy for taking the OMR Interventions forward.
Phasing Considerations with LTS		OMR Interventions ought to be able to be progressed and implemented without any impact on the programme for the Long-term Solution. Consideration will however be required with relation to its interface with the existing A83 Trunk Road.

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	Dependent on the preferred Long-term Solution, the LTS construction may require closure of the A83 Trunk Road, and the OMR then may be required to be fully operational during the construction works.
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Implementability		RAG Rating		
		RED	AMBER	GREEN
Engineering	Topography and Alignment Considerations	RED		
	Geotechnical / Earthworks Considerations			GREEN
	Geohazards		AMBER	
	Structures Considerations			GREEN
	NMUs/WCHs			GREEN
Constructability Considerations	Construction Sequencing & Methodology			GREEN
	Control of surface water and protection of environment			GREEN
	Site Location		AMBER	
	Logistics, access and available working room		AMBER	
	Earthworks			GREEN
	Temporary Works			GREEN
	Health & Safety Risks (Construction)			GREEN
Environment	Biodiversity, Fauna and Flora		AMBER	
	Population (land use & accessibility) & Human Health		AMBER	
	Water Environment			GREEN
	Soils		AMBER	
	Air Quality		AMBER	
	Material Assets		AMBER	
	Cultural Heritage	RED		
	Landscape and Visual Amenity		AMBER	
Operational Considerations	How it operates		AMBER	
	Risk of Closure – Highways		AMBER	
	Risk of Closure – Flooding			GREEN
	Risk of Closure – Geotechnical / Geohazards			GREEN
	Safety		AMBER	
	Journey Times			GREEN
Financial Considerations	Capital			GREEN
	Operational		AMBER	

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Estimated Time to Completion	Implementation			
	Construction			
Interface with FLS				
Consenting Considerations	Need for EIA			
	Need for 3rd party land			
	Need for Orders			
Phasing Considerations				