

Can We Rest and Be Thankful Yet? Solutions and Effective Stakeholder Engagement for the A83 Trunk Road Route Study

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1 Introduction

In recent years a number of debris flow events have closed the A83 trunk road in the vicinity of Rest and Be Thankful. The resulting road closures have caused traffic delays and wider socio-economic impacts. This paper describes how stakeholder engagement was used to gather evidence of these impacts, how this was used in the economic appraisal of a range of solutions and how stakeholder engagement was maintained throughout the development of the study.

2 Background to this paper

2.1 A83 Rest and Be Thankful Landslides

The section of the A83 between Ardgartan and the Rest and Be Thankful car park has a history of hillside instability, in particular the slopes above the Rest and Be Thankful. This has led to road closures on six occasions between 1 January 2007 and 31 October 2012 for a total period of 34 days.

Following a number of landslides in 2004, Transport Scotland undertook the Scottish Road Network Landslides Study. As part of the Implementation Study, a hazard assessment and ranking was undertaken for debris flow. From this assessment the A83 Ardgartan to Rest and Be Thankful is amongst the most highly ranked debris flow hazard sites in Scotland.

By mid-2012, some preventative measures had been implemented including upgrading some culverts and the installation of approximately 168m of debris flow barriers and fences. Further measures were in progress during 2012 to install a further 90m of debris flow barrier together with a debris flow basin and an Emergency Diversion Route was being created along the Old Military Road to provide a short-term alternative route in the event of road closures at Rest and Be Thankful due to landslides.

2.2 A83 Trunk Road Route Study

In July 2012, Transport Scotland commissioned the A83 Trunk Road Route Study to examine the landslide problem at Rest and Be Thankful and consider options to minimise the effects of road closures on the local communities and road users in the area. The study also examined the remainder of the A83 Trunk Road from Tarbet to Kennacraig and considered measures to address other issues along the route.

2.3 A83 Taskforce

Following a landslide at Rest and Be Thankful on 1 August 2012, the A83 Rest and Be Thankful Taskforce was established to provide leadership and direction and ensure the delivery of the A83 Rest and Be Thankful emergency diversion route and the wider study into the permanent solution to landslides at this area. This taskforce was chaired by Keith Brown MSP, Minister for Transport and Veterans, and comprised members representing a wide range of local interests.

3 Stakeholder Engagement

3.1 Workshops

A stakeholder consultation workshop was attended by various parties including local elected members, officials from Argyll and Bute Council, community council representatives, transport operators, local business groups, Transport Scotland, the operating company and Jacobs. Further written feedback was also received from stakeholders through the project email address.

A further (technical) workshop was held with a focus on operational management issues with representatives from Transport Scotland, the operating company, the Transport Research Laboratory (TRL) and Jacobs.

The objective of these workshops was to provide stakeholders an opportunity to discuss the issues and consequences relating to landslides at Rest and be Thankful as well as constraints on the whole of the A83 Trunk Road and allow them to contribute their views on any ideas or possible solutions that might help remedy those issues. A set of draft objectives for the study was also presented and discussed and suggestions for changes or additions invited.

3.2 Telephone Interviews

In addition to the feedback received at the workshop, an economic impact assessment was undertaken which involved further telephone interviews, conducted with some of the transport operators and local businesses in order to collect more detailed information in relation to the effect on journey times, costs and loss of income (see section 5 for more details).

3.3 Issues raised by Stakeholders

The issues raised by stakeholders were as follows:

3.3.1 Transport

- The A82/A85/A819 diversion route results in significantly increased journey times. Journey times between Tarbet and Inveraray increase by approximately 45 minutes, while journey times between Tarbet and the Cowal increase by approximately 70 minutes.
- Public bus services are affected by the diversion route and require the operators to implement an alternative timetable, including the need for a relief driver for each service. Closure of the road and the use of the diversion add to operating costs and the time taken for the journey – an additional 45 minutes.
- Passenger numbers on the Campbeltown to Glasgow bus service 926 have been recorded to reduce from 40 to 20 during closure periods.
- Stakeholders have advised that there is an increased risk of accidents due to the use of an unfamiliar diversion route and significantly longer driving times result in additional time pressures.
- Increased journey times can result in ferry connections to Islay and Gigha being missed with a resultant knock on effect to businesses on the islands. In the peak seasons, ferry sailings can be fully booked, so vehicles may not be able to cross on the next sailing.
- Some school pupils travel to school through the landslide area. When the route is closed, travel to school via the diversion route is not considered viable.
- Access to and from the study area for personal and social reasons is reduced, e.g. shopping and hospital appointments.

3.3.2 Forestry & Haulage

- The majority of local timber production is moved by road to processors in the Central Belt, Ayrshire and Fort William. Approximately 40 loads per day move via the A83 and Rest and Be Thankful.

- Hauliers expect to make two return trips per day; however when Rest and Be Thankful is closed only one return trip per day is possible. This adds to costs and affects ability to make deliveries as scheduled.
- The effect of “missed” deliveries is felt further down the processing chain with sawmills/other processors often depending on a continuous supply of timber.
- The “unreliability” of supply could result in a longer term effect on future sales from the A83 area as sawmills/other processors source some timber from other areas to ensure that they have continuity of supply.
- The points made regarding two return trips per day apply to other hauliers delivering some non-timber products.
- There can be additional pressure on hauliers delivering specific products to certain destinations (e.g. ports, supermarkets etc) where the haulier is given a specific delivery slot and the goods will not be accepted after this time.
- Businesses experience additional costs from additional fuel, staff time and other running costs; the costs vary depending on the nature and size of the business, however some businesses report daily additional costs in excess of £3,000.

3.3.3 Tourism

- There was concern that tourist trips are lost as closure of the A83 at Rest and Be Thankful makes it more difficult to access the region.
- Coach tours are planned with specific itineraries, distances and travel times to meet the needs of the driver and passengers. The A83 diversion route can pose problems for this part of the market in terms of meeting the itineraries and if the problem persists, there is a concern that tours will be put off travelling to the A83 area.
- The cruise market is an important part of the Scottish tourism sector. Many of the passengers arriving at Scottish ports take organised trips to nearby attractions. Passengers arriving at Greenock often visit Inveraray but this is only possible when the A83 at Rest and Be Thankful is open.
- There was also concern about the long term adverse effect on visitor numbers due to the perception that the area does not have reliable access.
- Discussions suggest a reduction in tourism expenditure of between 20% and 36% per day when the A83 is closed at Rest and Be Thankful.
- Some businesses along the A83 between Taret and Inveraray can experience a particularly severe loss of turnover when the Rest and Be Thankful is closed since very few (if any) visitors travel this section of the road.

3.3.4 Public Sector

- Argyll and Bute covers a large area and there is often a need for public sector employees to move between offices. When the diversion route is in place this adds to costs and the time taken for staff to get to meetings.
- Fire cover in the area is provided through a combination of full-time, retained and volunteer stations with the majority of stations being in the retained and volunteer category. The need to provide additional resources from other stations in the event of an incident incurs additional time and costs if the diversion route has to be used.
- Using the diversion route results in logistical problems for the fire and rescue service, but it also reduces the resilience of fire cover in the areas which have sent vehicles/resources onto the diversion route.
- The police and ambulance services experience increased attendance times due to travel via the diversion route.

3.3.5 Other Potential Effects

- Closure of the road and the diversion route give the impression that the A83 study area is difficult to access and access is not reliable. Given the declining population of the area, there is a need to attract population, but the perception of problems surrounding access will potentially make this more difficult, particularly given the links between the A83 study area and Glasgow for access to certain services e.g. hospitals.
- There has also been substantial investment in the parts of the A83 study area in recent years (e.g. the wind turbine manufacturing site at Machrihanish and the Machrihanish Dunes golf and hotel complex) and it is important that further investment is not hampered by perceptions that the A83 is not a guaranteed link into the area.

The issues raised were examined alongside previous reports, studies and accident records for the route in order to build up the evidence of the identified problems. These issues were considered in the identification of transport problems and constraints.

Regular engagement and collaborative working took place throughout the project with specialists from Transport Scotland, Transport Research Laboratory and the operating company. Engagement with economics specialists from Transport Scotland enabled a joint approach on the determination and quantification of economic benefits and impacts to be developed.

4 Option Development and Assessment

4.1 Option Generation and Sifting

The study examined a range of potential long-term solutions in the form of alternative routes for access to the A83 study area. Route corridors remote from the Glen Croe valley were rejected at an early stage since these options did not meet the transport planning objectives of the study. They resulted in increased journey times and the anticipated cost and potential environmental impacts of such routes were considered disproportionate to the identified problems on the existing A83 Rest and Be Thankful.

Six route options in the Glen Croe valley were identified for assessment as shown in Figure 1. These include new route corridors within the valley, options which incorporate a debris flow shelter or a multi-span viaduct or a tunnel or less heavily engineered hazard reduction measures on the existing A83 corridor.

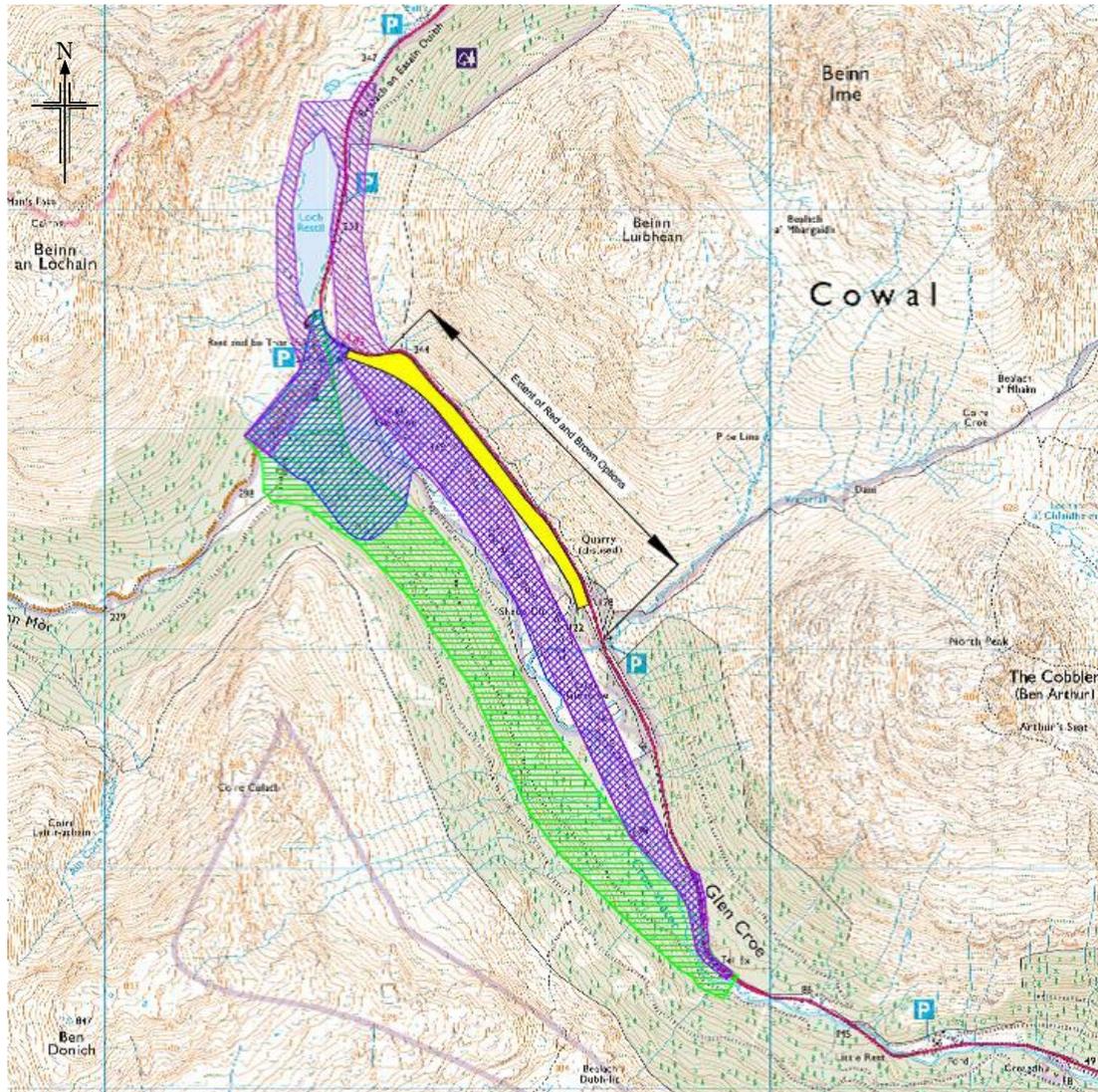


Figure 1: Glen Croe Route Corridor Options

4.2 Engineering and Environmental Assessment

The **Red Corridor Option** maintained the existing alignment of the A83 and included a range of landslide mitigation measures such as: additional 440m of debris flow barriers; improved hillside drainage, and; introduction of vegetation and planting on the slope. This option would significantly reduce the frequency of occurrence of landslide debris reaching the A83 Trunk Road causing a full road closure and offered the potential for implementation in phases. It was not considered to have any significant environmental effects. The cost estimate for this option was in the range £9-10 million (2012 prices, excluding VAT).

The **Brown Corridor Option** closely followed the alignment of the existing A83 and involved the construction of a debris flow shelter over a length of 1km to protect the road and road users in the event of future debris flow events. The introduction of debris flow shelters could have impacts on the local landscape and views, although the significance of these impacts would depend on the appearance and extent of the shelters. The cost estimate for this option was in the range £105 – 120 million (2012 prices, excluding VAT) and there would be significant disruption during construction, including periods of full road closures.

The **Yellow Corridor Option** provided a new 1.5km single carriageway offset slightly from the existing A83. Around 1.2km of the new alignment would be constructed on viaduct following a similar profile to the existing road with an average gradient of 5%. The viaduct would permit debris flow events to pass below the A83 but it could have impacts on the local landscape and views. The cost estimate for this option was in the range £83 – 95 million (2012 prices, excluding VAT).

The Purple and Blue Corridor Options began further down Glen Croe and generally ran parallel to the Old Military Road until they reach the property at High Glencroe. The **Purple Corridor Option** continued northwards in tunnel and rejoined the existing A83 in the vicinity of Loch Restil. A route alignment with a maximum gradient of 4% was considered feasible, resulting in a 1.9km long twin bore tunnel. Potentially significant environmental impacts were anticipated in relation to ecology, landscape and visual intrusion. The cost estimate for this option was in the range £460 – 520 million (2012 prices, excluding VAT).

The **Blue Corridor Option** ran generally parallel to the Old Military Road and curved and climbed steeply at a maximum gradient of 8% around the top of the glen before joining the alignment of the green option which passes to the west of the Rest and Be Thankful car park and re-joining the existing road before Loch Restil. The road alignment of this option was below desirable minimum standards for a new Trunk Road and potentially significant environmental impacts were anticipated in relation to ecology, landscape and visual intrusion. The cost estimate was in the range £66 – 75 million (2012 prices, excluding VAT).

The **Green Corridor Option** provided a new 4.0km single carriageway and follows the opposite side of the valley to the existing A83. While the alignment generally followed the line of existing forestry tracks, significant engineering measures would be required to form a new single carriageway road on this hillside, including measures to reduce the landslide hazard in this corridor. The cost estimate range for the Green option was £27 – 91 million (2012 prices, excluding VAT). This was a wide cost range and reflected a varying level of protection to landslides. At the low end of the cost range (£27 – 30 million), without significant landslide protection measures, the route may be as susceptible to closure due to landslides as the existing A83. The higher end of the cost range (£81 – 91 million) represented the expected cost to provide a route where the likelihood of closure due to landslides is negligible (comparable to the Brown and Yellow corridor options). This option may result in impacts on ecology and the local landscape and views, although the significance of these impacts would depend on the form and alignment of this route.

In addition to the six route options in the Glen Croe valley presented above, the study considered the landslide hazard of other sections of the A83 Trunk Road between Tarbet and Kennacraig, providing a wider context for issues at Rest and Be Thankful. There are nine other locations on the A83 with a landslide hazard ranking classification of High/Very High covering a route length of around 31km. The proposed options to address ground related hazards at Rest and Be Thankful should be accompanied by actions to address the ground related hazards to those other parts of the A83 Trunk Road, in particular at Glen Kinglas, Cairndow and Loch Shira, if the whole route length is to achieve comparable levels of risk reduction.

4.3 Appraisal Summary

The results of the engineering and environmental assessment were collated into a series of Appraisal Summary Tables which provided a mainly qualitative comparison of the potential options.

The Red Option was expected to significantly reduce the frequency of occurrence of landslide debris reaching the A83 Trunk Road at a much lower cost than the other options.

The viaduct option (Yellow) performed better against the appraisal criteria in comparison to the debris shelter or tunnel options (Brown and Purple). The viaduct option had lower cost than both the debris shelter and tunnel options with lower environmental impact than the tunnel option and lower construction impact than the debris shelter option.

The Blue and Green corridor options had comparable estimated costs, in the range £27-91 million excluding VAT. For both of these options the residual risk of road closures due to landslides was considered to be negligible, as the options include appropriate mitigation measures in the form of engineering structures, in particular lengths of viaduct. The Green option however performed better against the safety criteria due to a more desirable route alignment and was therefore taken forward for further consideration.

As a result of this appraisal of options, the Brown, Purple and Blue options were sifted out of the appraisal and the Red, Yellow and Green options were taken forward to a more detailed economic appraisal.

5 Economic Appraisal

A conventional economic appraisal was undertaken, conducted along Scottish Transport Appraisal Guidance (STAG) methodology with particular focus on the economic criterion, measuring the journey time and vehicle operating cost disbenefits associated with the diversion routes. This is an economic *welfare* measure which captures broad impacts but is not designed to capture some of the specific disbenefits to businesses associated with occasional road closures. Therefore, supplementary analysis based on surveys of local businesses was also undertaken.

5.1 STAG appraisal

The central part of the STAG analysis combined the following data:

- Average number of days per year this section of the A83 has been closed
- Journey distance and time of the standard route and possible diversion routes
- Changes in travel costs (value of time and fuel related)
- Impact of landslip on traffic flows
- Assessment of reduction in closures associated with each engineering option

5.1.1 Average number of days

Details of closures are provided in Error: Reference source not found below. There were six closures in the time period in question with an average annual duration of 5.4 days. (Days featuring overnight closures were treated as half days. This is consistent with traffic flows which were roughly half what would have been expected.)

Date Closed	Date Opened	Length of Closure	Additional Comments
01-Aug-12	03-Aug-12	2 days, 2 hours	
22-Jun-12	23-Jun-12	18 hours, 15 minutes	High risk of landslide
22-Feb-12	24-Feb-12	2 days, 22 hours, 30 minutes	
01-Dec-11	03-Dec-11	2 days, 1 hour, 30 minutes 11 x 16½ hours	A83 open from 08:30 to 16:00 only from 03-Dec-11. This restriction was lifted from 14-Dec-11.
08-Sep-09	10-Sep-09	2 days, 2 hours, 30 minutes	
28-Oct-07	13-Nov-07	17 days	

Table 1: Record of road closures – 1st January 2007 – 31st October 2012

5.1.2 Diversion route

A new diversion route has been established on the Old Military Road through Glen Croe, roughly parallel to the existing road. This has been used as the *without scheme* baseline to assess disbenefits associated with closures. While this adds only 0.7km to the journey there is a more significant travel time impact because vehicles must travel in convoy on this single track road.

The alternative, and previously used, diversion route follows the A82 between Tarbet and Tyndrum, the A85 Tyndrum to Dalmally and finally the A819 between Dalmally and Inveraray before rejoining the A83 as shown in Error: Reference source not found.

Error: Reference source not found demonstrates the impacts on the diverted traffic. The journey times are between Tarbet and Inveraray. The Old Military Road time is an average; times vary between 37 and 66 minutes depending upon whether the vehicle just makes or just misses the departure of a convoy. Journey times on alternative route as measured in normal conditions have been increased to take account of likely greater congestion following A83 closure.

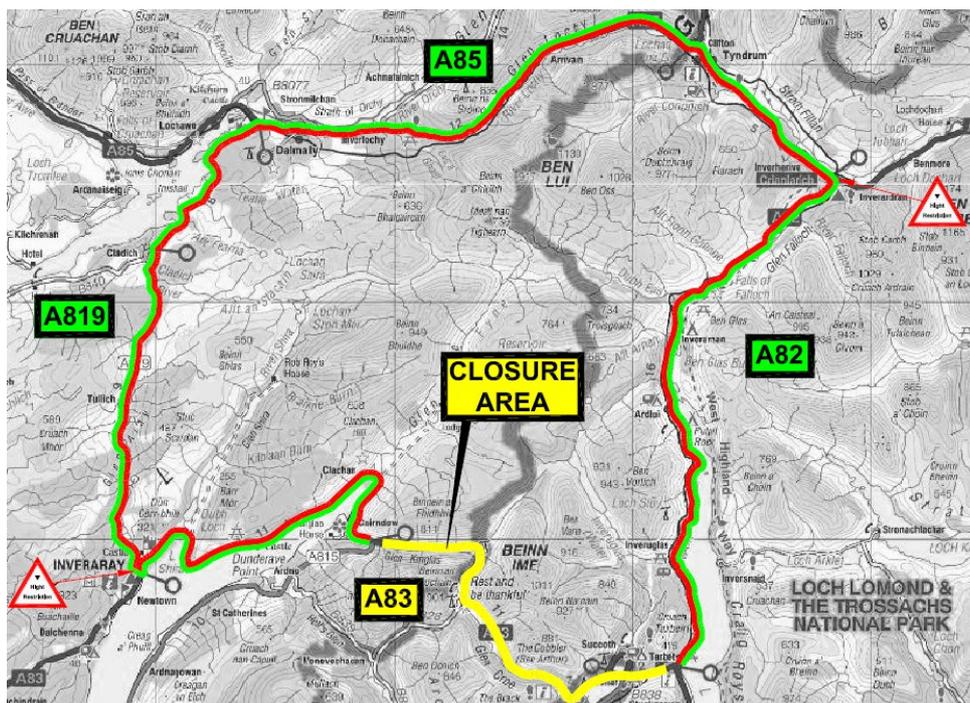


Figure 2: A83 Diversion Route via A82/A85/A819.

	A83 between Tarbet and Inveraray	A82/A85/A819 Diversion route	A83 and diversion via Old Military Road
Journey in kilometres	37.5	78.1	38.2
Journey in minutes	32	75	52

Table 2: Journey time and distance impacts on diverted traffic for journey between Tarbet and Inveraray

5.1.3 Changes in travel costs

Changes in travel costs have been calculated using the travel times and distances provided in Error: Reference source not found, with standard vehicle operating cost formulae being used to calculate fuel and non-fuel related costs. Standard values of time have been applied. As seen in Error: Reference source not found below, these vary by the relative contribution of journey times and fuel costs, e.g. for HGVs the fuel cost dominates travel costs so the increase is low relative to other vehicle types because the diversion route adds little to the journey length but is more significant in terms of time delay.

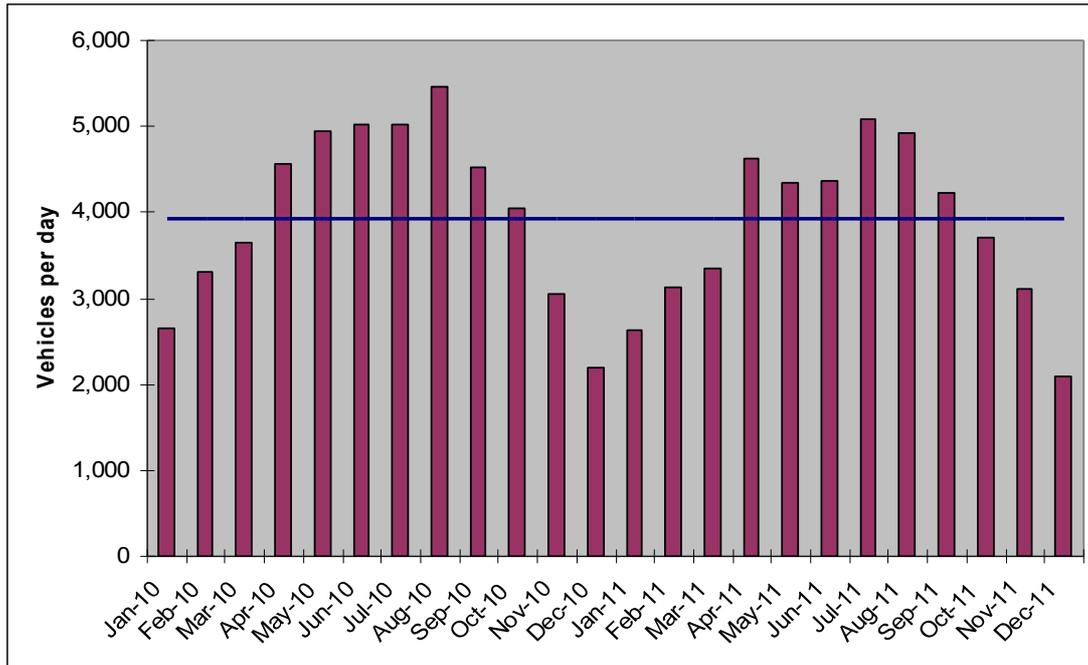
Motorbike	Car / Van	Car + Trailer	LGV / Rigid HGV	HGV	Bus
63%	39%	39%	35%	25%	42%

Table 3: Increases in Travel Costs between Tarbet and Inveraray in 2012.

(Note: These increases in costs do not include the fuel cost of idling while waiting to join the convoy at the Old Military Road.)

5.1.4 Traffic flows

Estimates of the number of journeys affected by a landslide have been based on traffic count data which, as shown in Error: Reference source not found, shows an average two-way flow of 3,918 vehicles per day with a marked seasonal profile. Approximately 89% of these vehicles were cars or vans, with 9.5% being a LGV and HGV.



Note: The horizontal line represents the average of the monthly mean traffic counts from Jan 2010 to Dec 2011.

Figure 3: 7 Day Average Traffic Count Data on the A83 – 2010-11

Based on previous work¹ into the landslide during the first week of November in 2007 based on traffic count data, and adjusting for improved diversion route times, it is estimated that around 80% of trips would use the diversion route, with the remainder either changing route or delaying/cancelling their trip. Estimates are shown in Error: Reference source not found, varying by vehicle type according to changes in travel costs.

Motorbike	Car / Van	Car + Trailer	LGV / Rigid HGV	HGV	Bus
71%	82%	82%	84%	88%	81%

Table 4: Proportion of the base journeys that use the diversion route

Applying the proportions above to traffic count data, the number of trips diverted due to a landslide can be estimated. It is then assumed that those trips that divert bear the full change in transport costs, whilst costs for re-routed, cancelled or delayed trips are assumed on average to be half of this, as standard in transport appraisal². These values can then be multiplied by the estimated average annual

¹ Transport Scotland (2009)

² <http://www.dft.gov.uk/webtag/documents/expert/unit3.5.3.php>

number of closure days to give the annual estimate of disbenefits, which are grown over the 60 year appraisal period using standard growth values from STAG.

Other impacts, such as that on drivers' costs and hours if additional rest periods are required or scheduling impacts, have been assessed as part of the socio-economic impacts section below. It is notable that two methods produced broadly similar estimates of impacts. N.B. These cannot be added together because this would involve some double counting of disbenefits. Data is not available to allow the assessment of additional costs if ferry connections are missed.

A potential additional impact connected to reliability is that the risk of landslide has discouraged people from making trips. However, it has not been possible to establish this with more than anecdotal evidence. A high level analysis of the number of trips in summer on the A83 over time shows evidence of a long term decline not witnessed on more northerly routes but the decline predated the 2007 landslide and there may be other economic and social factors affecting traffic flows on the route. (N.B. Traffic count data from different points on the road suggests an upturn in flows in the past year since this study was undertaken.)

5.1.5 Assessment of reduction in closures associated with each engineering option

Benefits have been calculated by estimating the proportion of the landslide disbenefits that would be avoided by introducing each option, i.e. by reducing road closures, as shown in Error: Reference source not found. These are based on engineering judgement made for the purposes of appraisal and must be treated with caution.

Option	Reduction in the average number of landslide related road closures per year
Red	90%
Yellow	100%
Green (Low)	90%
Green (High)	100%

Table 5: Estimated impact of the various options

For the costs of the different options, capital costs, maintenance costs and landslide clear up costs have been taken into account. For the capital costs the mid-point of the estimated range for each option has been used, while high level assumptions have been made with regards to the maintenance costs. The landslide clear up cost is based on actual clear up costs of a previous landslide incident.

The results of the economic analysis of the various options are set out in Error: Reference source not found. All figures are in standard 2010 discounted market prices.

	Red Option	Yellow Option	Green Low Option	Green High Option
Present Value of Benefits (PVB)	£2.54m	£2.67m	£2.47m	£2.67m
Present Value of Costs (PVC)	£5.86m	£69.67m	£21.37	£66.47m
Net Present Value(NPV)	-£3.32m	-£67.00m	-£18.90	-£63.80m
Benefit to Cost Ratio (BCR)	0.43	0.04	0.12	0.04

Table 6: Appraisal indicators for the core economic analysis (£ in 2010 discounted market prices)

The results above show that the BCRs range from 0.04 to 0.43, with the best performing option being the red option. Under this core analysis none of the options provide a level of benefits greater than the present value of costs.

5.1.6 Sensitivity analysis

Sensitivity analysis was undertaken with higher/lower diversion factors and traffic flows and longer road closures. These can be seen in more detail in the published report. The Red Option remained the best performing option with the BCR ranging from 0.34 to 1.02.

5.2 Socio-Economic Impact Assessment

In order to assess more direct business impacts, telephone consultations were held with ten stakeholders in the local economy which covered the main sectors of the economy likely to be affected, including transport and tourism. N.B. This was undertaken before the new diversion route was established, so all impacts relate to the longer diversion route.

Economic impacts were assessed for three scenarios with different lengths of road closure (low = 2.5 days, central = 5.5 days and high = 13 days). The additional costs incurred per day of closure were provided through the telephone consultations. These costs were converted into an additional cost per vehicle and applied to the number of HGV and light goods vehicles travelling on the A83 using the data by vehicle type from the automated traffic counter for the site to the west of Arrochar. This provides a total additional cost per day for the haulage sector of using the pre-planned diversion route. Information was also received from the public bus service operator between Glasgow and Campbeltown on the additional cost per day of using the diversion route. It is assumed that these costs reduced profits and therefore represent a direct reduction in GVA in the A83 study area.

During the consultations with business and tourism organisations, tourism businesses reported a loss of turnover of 30% per day when the A83 was closed. This was grossed up to estimate the whole area impact by estimating the turnover and GVA of the sector in Argyll and Bute then estimating the A83 study area's share of turnover and GVA in the sector on the basis of its share of employment in that sector. GVA in the tourism sector in the A83 study area was 43% of turnover, such that 43% of the reduction in turnover per day would represent reduced GVA in the study area economy per day. This provides an estimate of the lost GVA in the sector each day the road is closed.

For each scenario, this lost GVA per day is grossed up by the average number of days for which the road was closed per year. Using GVA per employee in each sector, the number of jobs that would be supported by this lost GVA was calculated.

The additional annual cost to the A83 economy from landslides at Rest and Be Thankful was estimated to be £286,300 (in 2010 prices) under the central scenario. Under the central scenario, the lost income would support almost 12 jobs in the A83 study area. Details are shown in Error: Reference source not found.

The sensitivity analysis shows that the additional annual costs to the A83 economy from landslides at the Rest and Be Thankful are in the range £130,200 to £676,800. Assuming these costs represent a direct loss of income to the local area, the number of jobs which would be supported by this "lost" income is in the range 5 to 28.

GVA and employment impacts are also shown separately for transport and tourism. It can be seen that the GVA impact is practically the same for each but that the employment impact is higher in the more labour-intensive tourism sector.

	GVA (£000s, 2010 prices)	Employment
Overall		
Low	130.2	5.4
Central	286.3	11.9
High	676.8	28.2
Transport		
Low	65.0	1.6
Central	143.0	3.6
High	337.9	8.5
Tourism		
Low	65.2	3.8
Central	143.4	8.4
High	338.9	19.8
Source: Optimal Economics. (Figures may not sum exactly due to rounding.)		

Table 7: Estimates of Lost GVA and Employment in A83 Study Area as a Result of A83 Closure due to Landslide and the Operation of the Pre-Planned Diversion Route

6 Post-Appraisal Consultations

Draft reports were presented to the A83 Task Force and published on the Transport Scotland website in December 2013. Stakeholders were given eight weeks to provide feedback prior to finalisation of the reports. During this period, a technical workshop was held giving stakeholders the opportunity to discuss the technical content of the draft reports with representatives from Jacobs and Transport Scotland. In addition, two presentations were given to Argyll and Bute Council, one to a full council meeting and another to the Area Committee for Mid Argyll, Kintryre and the Islands.

While not all attendees at the technical workshop and the Argyll and Bute Council meetings agreed with the findings of the study, and in particular the preferred option for the Rest and be Thankful, these events provided important forums to present the findings, highlighting the benefits of the preferred options and the reasons for rejecting other alternatives. The forums provided an opportunity to inform stakeholders of the reasons for rejecting schemes, particularly where implementation would have required extensive road closures, resulting in disruption to users significantly greater than that caused by the debris flow events themselves.

Stakeholder comments were reviewed and, where appropriate, addressed in the final reports which were published in February 2013.

7 Conclusions

The study examined a range of options that have been regularly mooted in the local community as possible solutions at Rest and Be Thankful. This enabled each option to be properly considered and an appropriate engineering, environmental and economic assessment carried out. Each option was assessed in terms of its likely impact on future road closures and associated benefits and in terms of overall cost.

The STAG appraisal and the socio-economic impact assessment measured economic impacts of closures from different methodological perspectives and provided broadly similar estimates of disbenefits as a result of road closures.

The Red Option offered by far the best value-for-money in terms of benefits in relation to costs.

It would be unrealistic to expect stakeholder engagement to bring about full agreement between the public body and local stakeholders. However, the dialogue and transparency offered by this stakeholder engagement process facilitated better understanding on both sides and helped to reassure stakeholders of the efficacy of the Transport Scotland approach.

The initial stakeholder engagement provided valuable information about the issues affecting road users, local communities and businesses which was used in the socio-economic impact assessment. The post-appraisal consultations provided opportunities to explain the findings of the appraisal more fully so that the stakeholders in attendance were better informed about each of the options examined.

8 Post script

Since the A83 Trunk Road Route Study was undertaken there have been further debris flow events on this section of the A83. Two of these events occurred beyond the extent of the emergency diversion route (3 October 2013 at Glen Kinglas and 23 February 2014 at Butterbridge). On 6 March 2014 a debris flow occurred at Rest and Be Thankful in a gully which was about to be fenced in the last phase of work and some water borne material reached the carriageway, which was closed until 10 March 2014.

The emergency diversion route worked well and all vehicles were cleared through in each convoy, minimising impact during daylight. The local diversion route could not operate during the hours of darkness during this particular event as, following the debris flow, there remained a risk from large, potentially unstable boulders high up on the hillside and these could not be monitored in the dark.

The time taken to get through the diversion route was 15 minutes for vehicles joining the convoy as it departed. For vehicles just missing the departure of the convoy there was an additional 30 minute wait for the next departure, resulting in a 45 minute journey time. Assuming an even distribution of arrivals this gives an average journey time of 30 minutes, though this may be an overestimate given that the convoys may wait for some vehicles to arrive before departing.

In terms of feeding back to the assumptions in the appraisal, the assumption in table 2 was that the Old Military Road diversion would add 20 minutes to the journey, while the actual journey times appear to add around 25 minutes (assuming the section which is replaced takes 5 minutes).

Only in time will it be possible to test whether the assessment that the measures in the Red Option will be sufficient to reduce the number of days closed by 90%.

The fact that debris flow events occurred beyond the study area supports the supposition that the more expensive options would, in any case, only present a partial solution by focussing resources on only one section of the A83.

Finally, traffic count data from different locations on the A83 suggests an upturn in traffic flows in the past year since this study was completed.

9 References

Jacobs (February 2013). A83 Trunk Road Route Study, Part A – Rest and Be Thankful Final Report. Produced for Transport Scotland.

Jacobs (February 2013). A83 Trunk Road Route Study, Part B – Tarbet to Kennacraig Final Report. Produced for Transport Scotland.

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