Pell Frischmann

Avoch to Munlochy Active Travel Route

Initial Feasibility Review

Date: December 2019

Revision Record

Document2

Rev	Description	Date	Originator	Checker	Approver
A	Draft	09/12/2019	G Ludford Jones	S McGarva	

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1 Introduction

1.1 Purpose of the Report

Transition Black Isle (TBI) applied in 2014 to SUSTRANS' for funding of a feasibly study through the Community Links Programme to look into options of connecting Avoch to Munlochy. This was completed in September 2014. TBI has now secured further funding through the SUSTANS' Places for Everyone scheme which replaced the Community Links Programme to review routes between the two villages. This programme aims to improve the infrastructure for cycling and walking and by doing so, linking the places people live in with the places they want to get to.

Pell Frischmann (PF) has been commissioned by Transition Black Isle to undertake a Feasibility Study into a walking and cycling route between Avoch and Munlochy, located on the Black Isle. As part of the feasibility work, Pell Frischmann carried out an assessment of the study area, highlighted interventions which could offer benefit to the community, and engaged with the client.

Pell Frischmann will also engage with key stakeholders to ensure that the appropriate permissions, such as landowners' support and Local Authority approvals are secured.

The Feasibility Study has been prepared to help inform Transition Black Isle on the viability associated with the provision of a segregated cycle and walking route. The report identifies the design criteria applied to the scheme, what is achievable, and the various consultations with all parties and stakeholders.

A key focus for this scheme is to provide a continuous, direct, and coherent dual-purpose cycle/walking path linking Avoch and Munlochy, and the village of Munlochy with the Drumderfit Forest Trail.

The objective is to improve uptake in active travel by providing convenient cycling access to multiple trip generators and improving the cohesion of the existing cycling network and facilities.

2 Objectives

2.1 Aims and Objectives

The aim of the study is to ascertain the feasibility of establishing a functional and sustainable dual-purpose cycle/walking route between the villages of Avoch and Munlochy, located on the Black Isle.

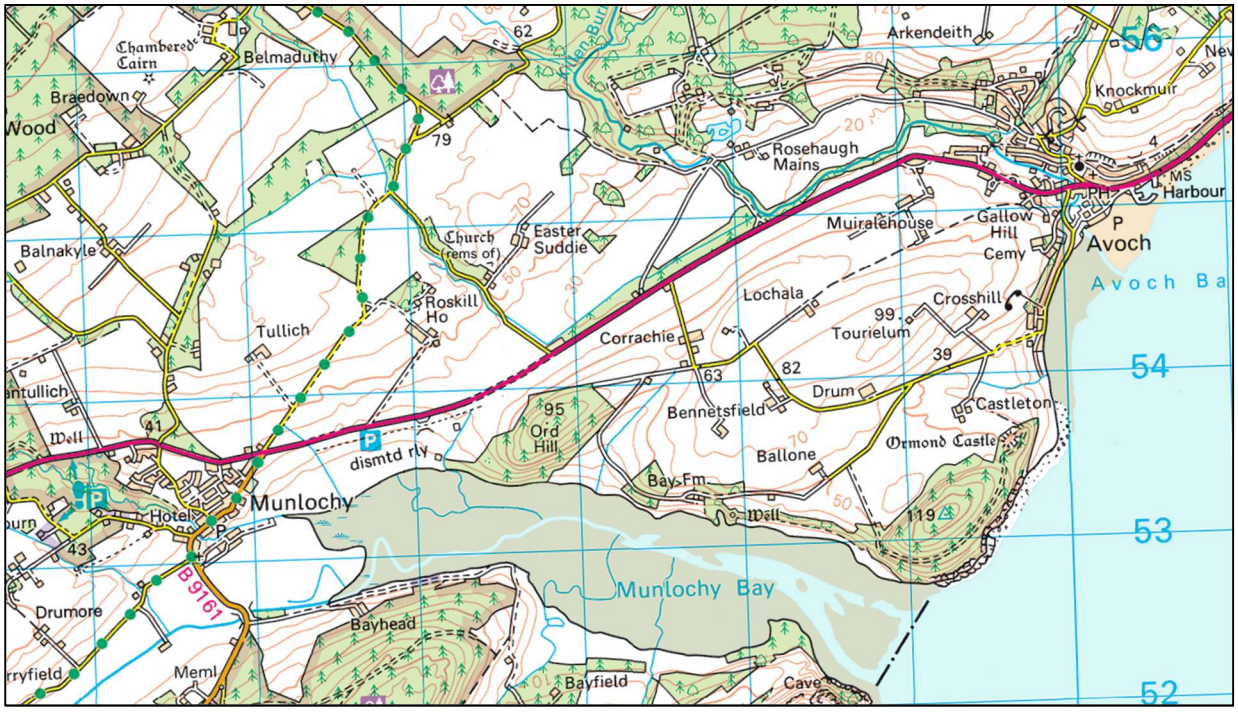
The key objectives are to:

- Provide a safer route for both communities and their facilities;
- Encourage people to become more actively involved in physical activity;
- Encourage children and others learn to cycle and cycle safely;
- Enhance the health of children and adults;
- Help children to gain independence and confidence;
- Help parents to have confidence in children's ability to use bicycles;
- Reduce traffic congestion and pollution;
- Improve community spaces;
- Provide an inclusive all-abilities segregated walking and cycling route.

2.2 Study Area

Transition Black Isle have identified the study area between Avoch and Munlochy

Figure 1: Study Area



2.3 Methodology

To ensure that a robust feasibility study is carried out, Pell Frischmann will be required to complete the following tasks:

- Identify and map the most suitable route options (assessed against the factors critical to the success of long-distance route development, promotion and future-use) and the most suitable path techniques;
- Catalogue known constraints;
- Carry out face-to-face negotiations with landowners along the line of the proposed path in order to assess the likelihood of getting permission for the route;
- Create an all-abilities route and carry out an Equalities Impact Assessment to ensure the proposals do not discriminate against any user group;
- Produce detailed designs of the agreed proposals, measurements, and specifications compatible with the relevant legislation, regulations, and guidelines, including Cycling for Design Scotland standards;
- Produce a detailed budget for the establishment of the recommended route;
- Develop a behaviour change strategy in order to inform future funding applications and activities to ensure that the maximum people-focused benefits are derived from the creation of this path; and
- Carry out Environmental, Topographical, and Archaeological surveys of the route.

The findings of the above are detailed within the following chapters of this report.

3 Access Route Review

3.1 Existing Situation

The study area between Avoch and Munlochy has limited pedestrian and cycle infrastructure at present. The study area is currently served by the A832 which is a single carriageway 60mph trunk road with no footways outside of the villages. PF have reviewed the initial infrastructure within the area to explore the opportunities to construct a traffic free segregated walking and cycling route

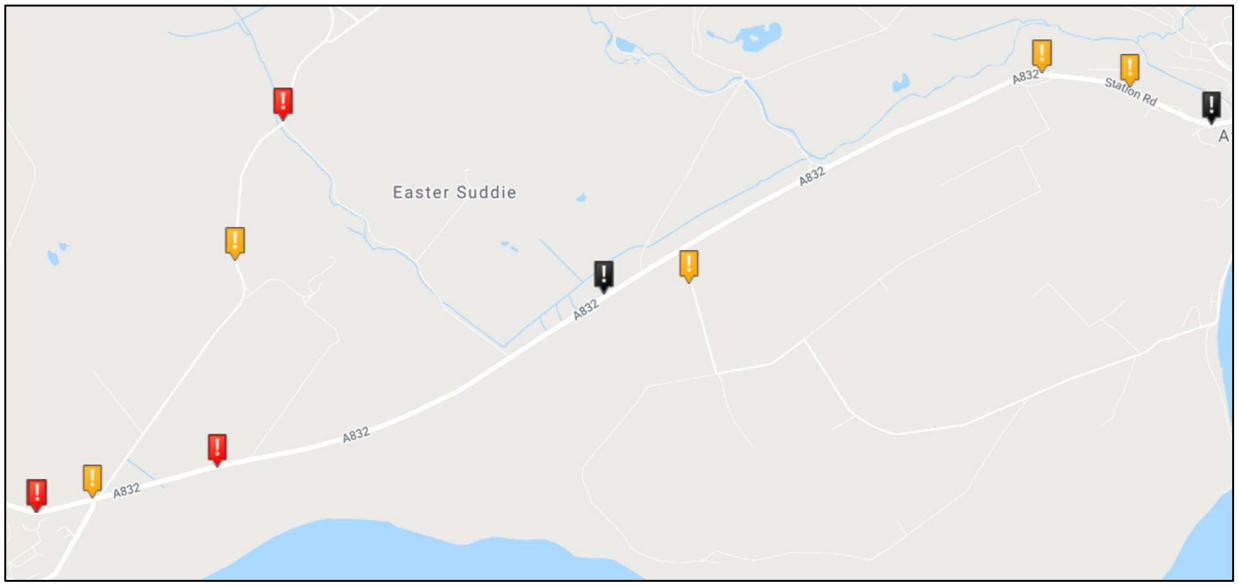
The southside of the A832 is agricultural farmland with one residential property noted about halfway along the route. There are 3 junctions with minor roads / accesses which will need to be crossed. There is evidence of an abandoned railway along the western section of the route.

The northside of the A832 is bound by the Rosehaugh Estate and areas of established woodland. Behind this is the Suddie Burn and the Rosehughburn. Further to the west the land use changes to agricultural farmland. There are 6 junction which would need to be crossed along this side.

Figure 2: Photo showing a section of the A832 midway between Avoch and Munlochy

A review of the online accident data site Crashmap has highlighted that in the past 5 years there 9 accidents on this route, two of which were fatal, two serious and 5 that were recorded as slight

Figure 3: Extract of accident data from Crashmap



The wider road network off the A832 includes the C1027 which joins the A832 with a priority junction just outside Munlochy.

Figure 4: Photo showing the western branch of the C1027 to Culbokie

The western arm of the C1027 to Culbokie branches off from the A832 at the very eastern edge of the village of Munlochy and travels in a northeast direction before turning northwest. It is fairly straight in some sections, quite sinuous in others. There is good forward visibility where it travels northeast as on either side of the road is flat agricultural land. There are no formal footways or cycle facilities and as the road is narrow (circa 3.5m) cars often must wait in passing places to allow oncoming traffic through.

The road is unsigned and assumed to be national speed limit as it branches off from a road that is signed as national speed limit.

Circa 1.9km along the C1027 there is a priority junction with an unnamed road which runs parallel with the Roskill burn. This road travels south from the C1027 joining back into the A832 at a priority junction. Access to Easter Suddie farm is halfway along this road.

Figure 5: Photo showing the unnamed road to Easter Suddie Farm and the A832

This road is mostly sinuous in layout and visibility is poor due to the numerous trees lining the road on both sides. There are no formal footways or cycle facilities and as the road is narrow (circa 3m) cars often must wait in passing places to allow oncoming traffic through.

The road is unsigned and assumed to be national speed limit as it branches off from a road that is signed as national speed limit.

The Roskill Burn runs parallel to the road on the western side for circa 800m before crossing under the road and then running along the east side before joining into the Suddie Burn.

There is a lot of infrastructure associated with the Rosehaugh estate, with a number of agricultural tracks and single track roads providing access to the various properties within the estate.

Figure 6: Photo showing the western entrance to the Rosehaugh Estate from West Lodge

The western entrance to the Rosehaugh Estate begins at West Lodge on the A832, close to halfway between Munlochy and Avoch. It is generally straight though visibility is not ideal due to the trees lining the route. It has been used as a farm track so there is no specific infrastructure for constant traffic, nor are there any formal footways or cycle facilities. The corridor is circa 3m wide.

The roads are generally unsigned through the estate and are used by farm machinery for access to the fields.

Figure 7: Photo showing the eastern approach to Rosehaugh Estate from Rosehaugh East Drive

The eastern entrance to the Rosehaugh Estate begins at the end of Rosehaugh East Drive in Avoch. It is generally straight though visibility is not ideal due to the trees lining the route. It has been used as a farm track so there is no specific infrastructure for constant traffic, nor are there any formal footways or cycle facilities. The corridor is circa 3m wide.

The roads are generally unsigned through the estate and are used by farm machinery for access to the fields.

Figure 8: Photo showing road south of Munlochy travelling to War Memorial and Drumderfit Forest

The road from Munlochy to the War Memorial and Drumderfit Forest starts at the junction of the A832 and the B9161 in Munlochy. It is sinuous and visibility is poor due to vegetation lining much of the route. There are no formal footways or cycle facilities outside of the village.

The road is signed as 30mph through the village of Munlochy, but changes to national speed limit once outside of the boundary.

3.2 Existing infrastructure

There is currently no pedestrian or cycle specific infrastructure in place within the study area. However, it is noted that the National Cycle Route 1 passes through Munlochy and continues north, avoiding Avoch and Fortrose. Additionally, there is a core path through the Rosehaugh estate to the north-west of Avoch.

Figure 9 below shows National Cycle Route 1 in and around the study area, and Figure 10 shows the Highland Council Core Paths routes.

Figure 9: National Cycle Route 1

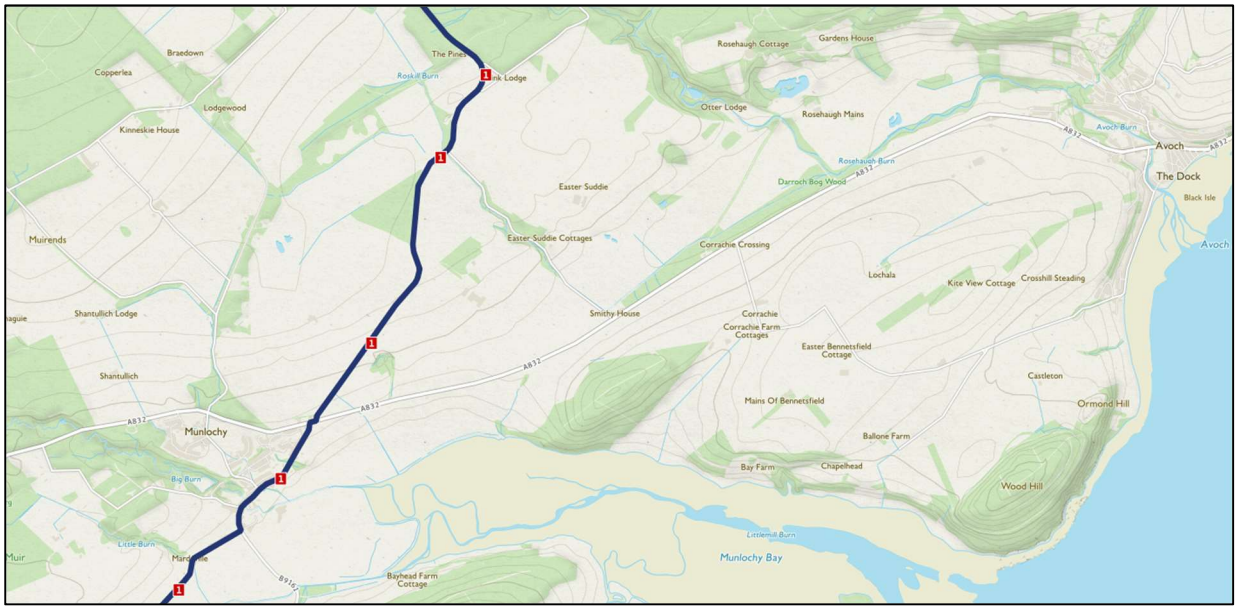
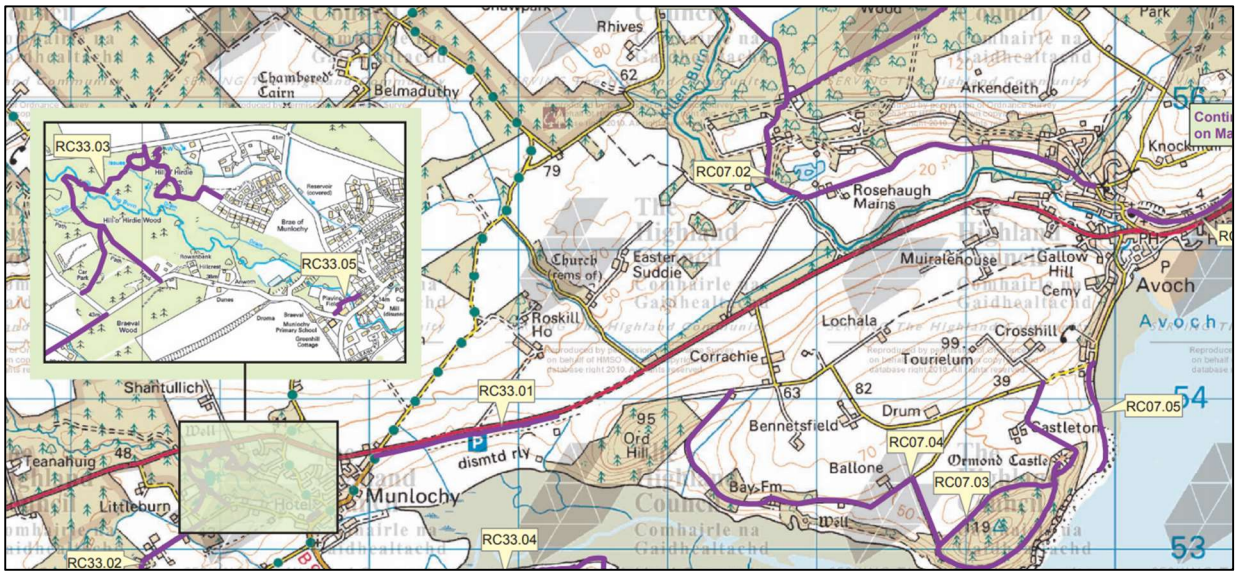


Figure 10: Highland Council Core Paths Plan for study area



3.3 Public Utilities

A public utilities search is in the process of being carried out and the appropriate authorities have been contacted for details of any plant and apparatus within the study area.

This will be captured within the final feasibility study.

3.4 Mine Workings

A search of the Coal Authority mine workings online GIS portal was carried out to establish if there was any historic evidence of mine workings within the area. The results of this search came back negative.

This was to be expected given the location of the site.

Figure 11 below shows the findings from this search.

Figure 11: Extract from Coal Authority mapping portal (copyright of SEPA)

3.5 Historic Scotland

A search of the Historic Scotland online archive GIS portal was carried out to establish if there were any listed properties or buildings of significance within the study area. The results of this search came back detailing 21 properties close to the study area which have a designated status. Excluding those in the centre of Avoch, these are:

1. The Dairy, Rosehaugh Estate – Grade A Listing
2. Rosskill (previously Wester Suddie) – Grade B Listing
3. Suddie Old Church Burial Ground, Munlochy – Grade B Listing
4. Rosehaugh Estate Lodge, Gatepiers, and Gates – Grade B Listing
5. The Laundry, Rosehaugh – Grade B Listing
6. Grays Cottage, Rosehaugh Estate – Grade B Listing
7. Fletcher Burial Enclosure, Rosehaugh Estate – Grade B Listing
8. The Stables, Rosehaugh Estate – Grade B Listing
9. The Garden House, Rosehaugh Estate – Grade B Listing
10. Avoch Village Toll Road, former Free Church, now Village Hall – Grade B Listing
11. Rosehaugh Estate Powerhouse – Grade C Listing
12. Kennels Cottage, Rosehaugh – Grade C Listing
13. Former Wine Store, Rosehaugh Estate – Grade C Listing
14. Stable Cottage, Rosehaugh Estate – Grade C Listing
15. Bridge over Killen Burn, Rosehaugh Estate – Grade C Listing
16. Garden Walls, Rosehaugh Estate – Grade C Listing
17. Rosehaugh Estate Bridge – Grade C Listing
18. The Burnthouse, Rosehaugh Estate – Grade C Listing
19. Knockbain Munlochy Parish Church and Boundary Wall, Munlochy – Grade C Listing
20. Avoch Football Ground Gate Piers and Gates – Grade C Listing
21. Knockbain Munlochy Parish Church and Boundary Wall, Munlochy – Grade C Listing

Figure 12 below shows the findings from this search.

Figure 12: Extract from Historic Scotland listed building mapping portal (copyright of SHN)

3.6 Flooding

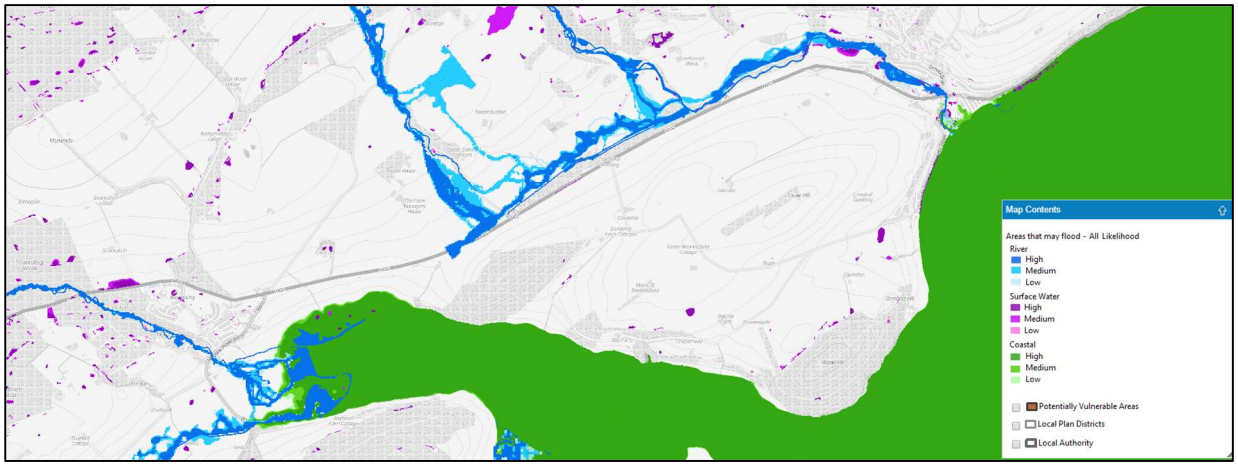
A search of the SEPA online archive GIS portal was carried out to establish if there was any flooding which may inform the location of any cycle and walking route as well as the construction method. The results of this search came back detailing that flooding was evident within the study area. Having reviewed the mapping and spoken with the local residents, we are of the opinion that the areas shown in fact relate to four local rivers, which are:

1. Roskill Burn
2. Suddie Burn
3. Rosehaugh Burn
4. Avoch Burn

From discussions with the local residents, it was advised that the areas where flooding was mapped does not raise high enough to impact on the existing road network nor the properties themselves. It was therefore concluded that flooding should be considered within any designs but should not have a negative impact on any proposals.

Figure 13 below shows the findings from this search.

Figure 13: Extract from SEPA flood mapping portal (copyright of SEPA)

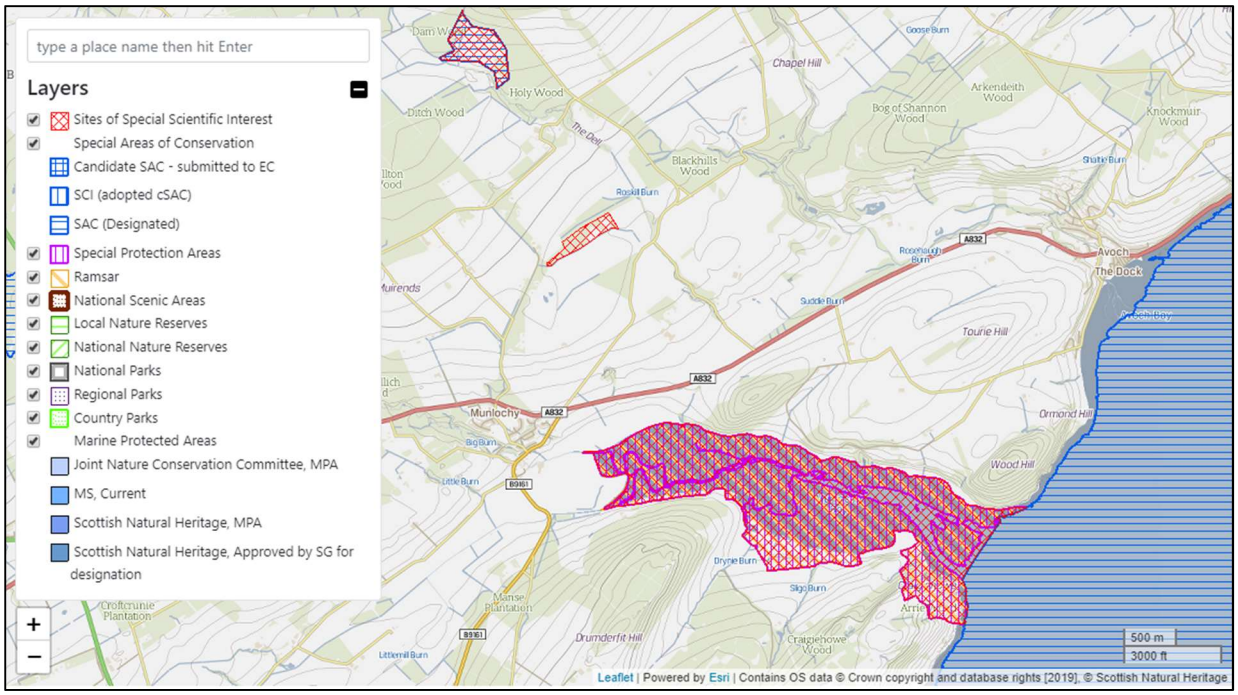


3.7 Scottish Natural Heritage

A search of the SNH online GIS portal was carried out to establish if there were any conservation areas within the study area that may inform the location of any cycle and walking route as well as the construction method. The results of this search came back showing that to the south of the A832 near Munlochy is Munlochy Bay, a Site of Special Scientific Interest that is also a Special Protection and Ramsar Area

Figure 14 below shows the findings from this search.

Figure 14: Extract from SiteLink (copyright of SNH)

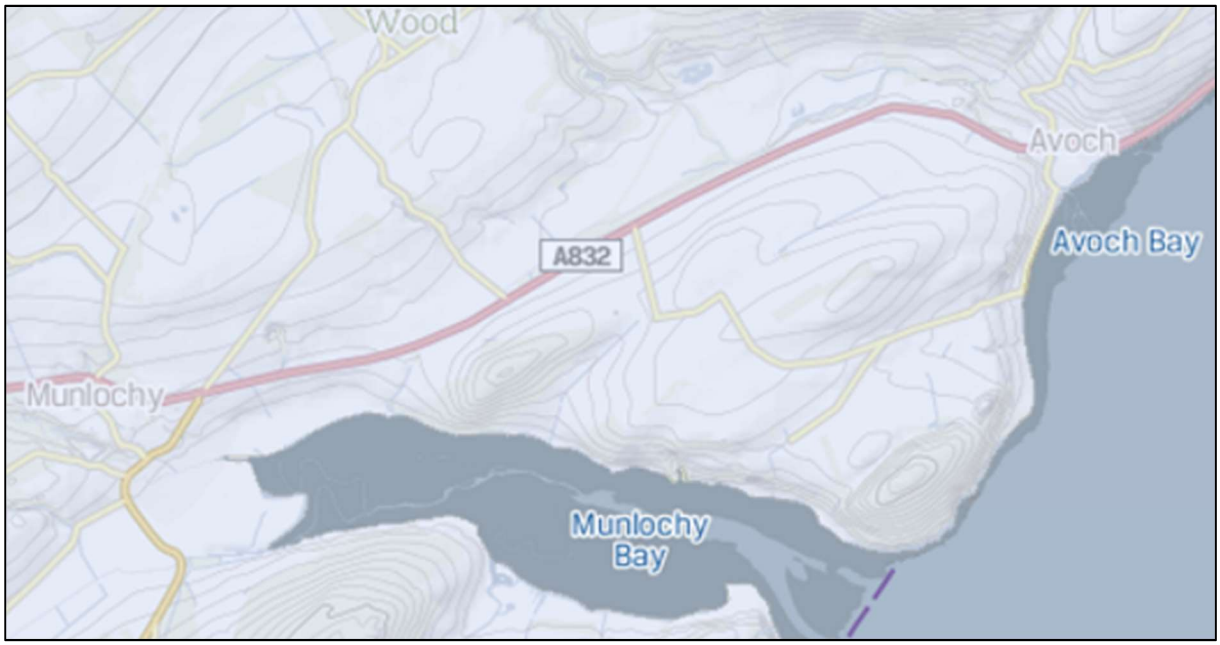


3.8 Drinking water and ground conditions

A search of the www.environment.gov.scot website has indicated that the entire area is classified as being a protected drinking water area and of a good ground water classification.

Figure 15 below shows the findings from this search.

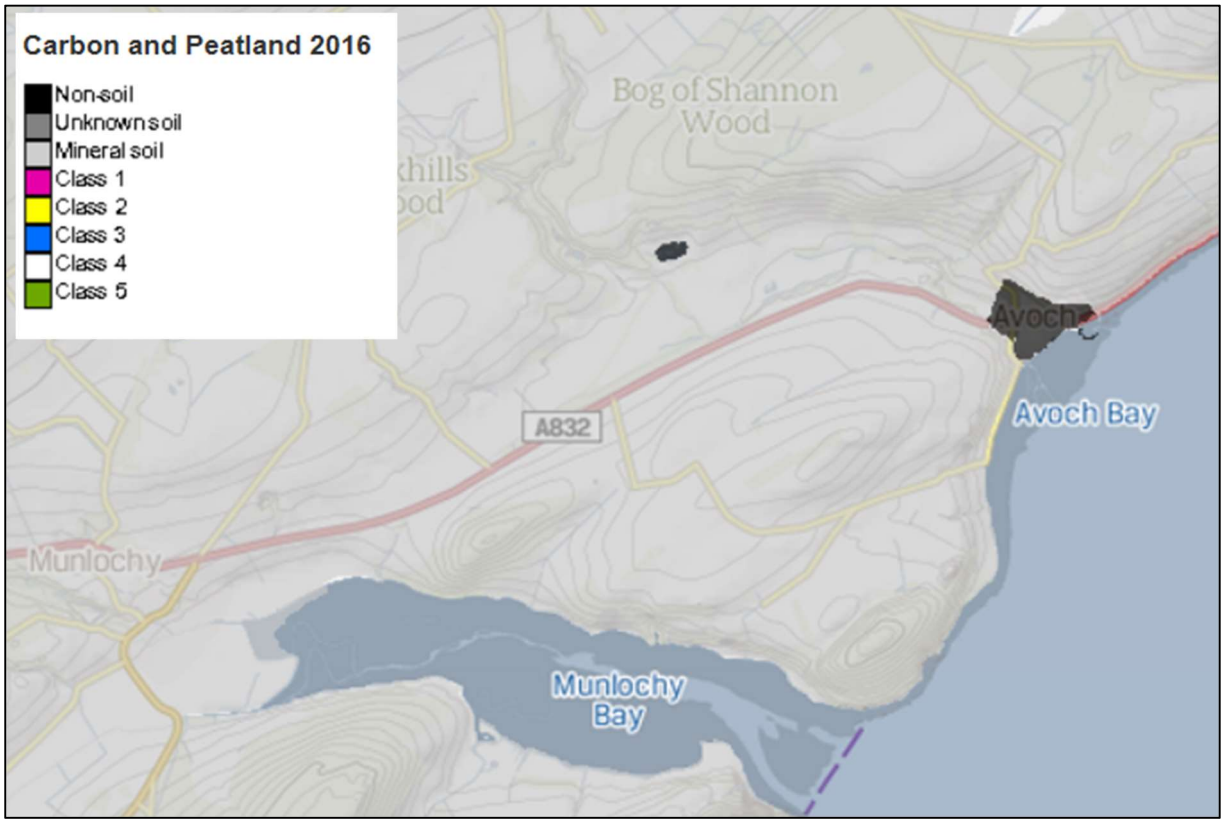
Figure 15: Extract from environment.gov.scot showing protected ground drinking water



The majority of the site is noted as being mineral soils, though much of the village of Avoch is shown to be classed as non-soil, as is a section of the Rosehaugh estate.

Figure 16 below shows the findings from this search.

Figure 16: Extract from environment.gov.scot showing soil type



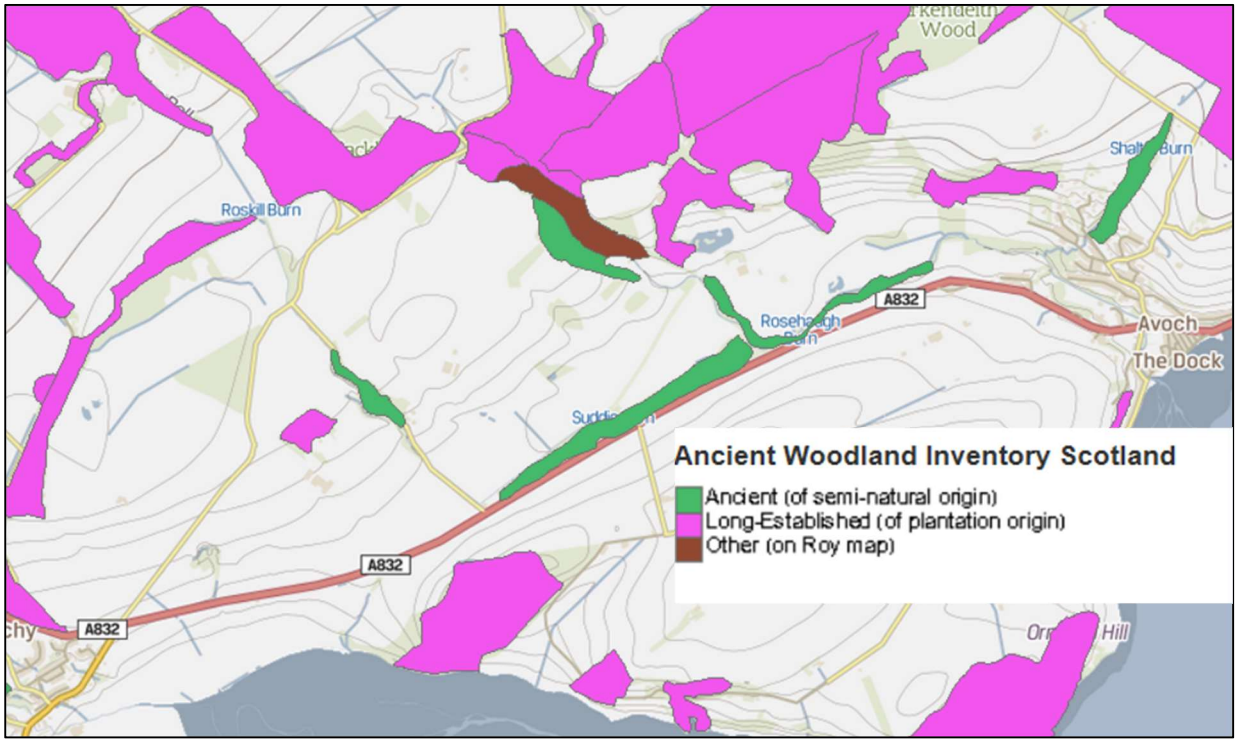
3.9 Ancient Woodland

A search of the www.environment.gov.scot website has indicated that sections of woodland along the northern side of the A832 within Rosehaugh Estate is classified as ancient woodland. This is protected status and would make any tree removal very difficult as obtaining planning permission is unlikely to be permitted.

Wider sections of the study area are also designated as long-established areas of woodland which has a lesser designation than ancient woodland but is still a protected designation making tree removal difficult as obtaining planning permission is unlikely to be permitted.

Figure 17 below shows the findings from this search.

Figure 17: Extract from environment.gov.scot showing woodland classification

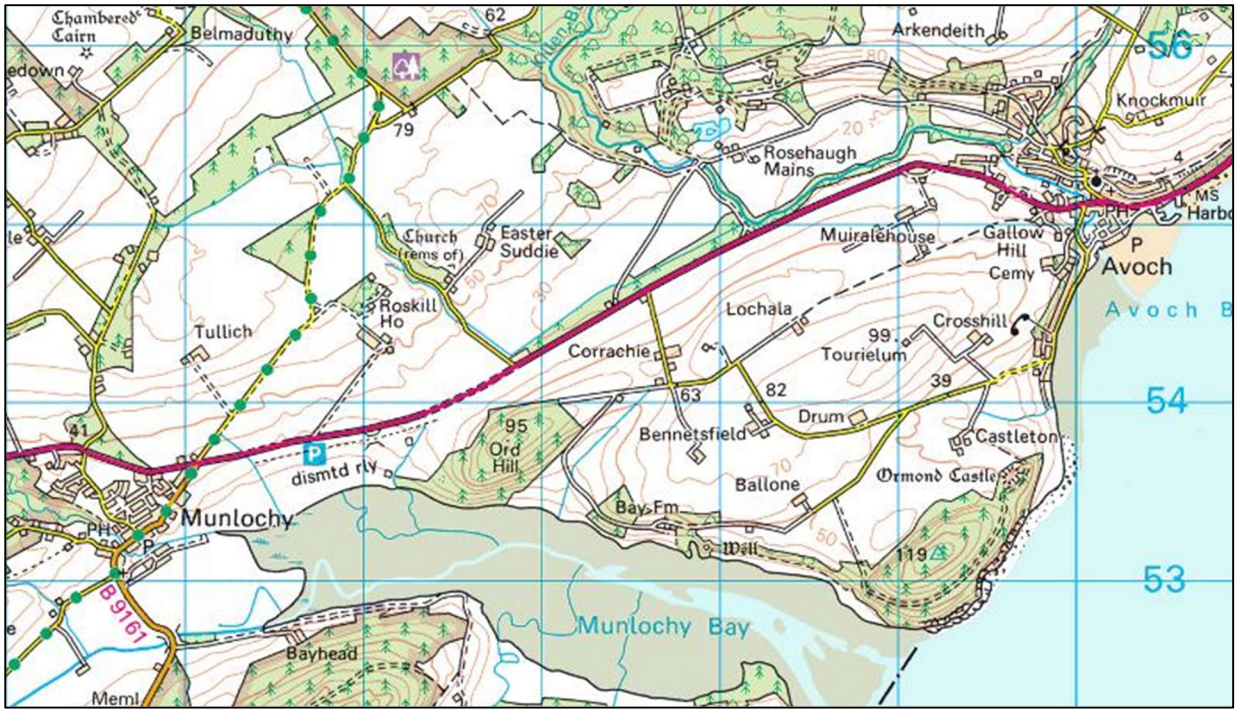


3.10 Land Owners

A review of the Crofting Register has highlighted that there are no crofts in the study area. It is understood that this register is not up-to-date and is missing data.

Figure 18 below shows the findings from this search, noting that it is not up to date.

Figure 18: Extract from Crofting Register



The two key landowners are understood to be Rosehaugh Estate and Roskill farm. Contact will be made with both parties and the wider community to gauge the level of support for the preferred route option.

3.11 Summary and considerations

As can be seen from the above information the study area has some constraints in terms of the SSSI covering Munlochy Bay, land ownership, protected woodland status and some potential flooding noted on the SEPA data.

In terms of design development, the key considerations will be to:

- Consult with Landowners and Stakeholders to ensure any proposals are sensitive to their needs;
- Ensure any designs around the rivers will be robust enough to withstand a rise in water levels during high rainfall events;
- Ensure that any design does not detrimentally impact on public utilities;
- Ensure that protected woodland is not affected; and
- Not impact on the SSSI at Munlochy bay

4 Design Development

4.1 Desktop Study

Following our appointment, Pell Frischmann have considered several options to link the two communities of Munlochy and Avoch, and Munlochy with the War Memorial and Drumderfit Forest Trail. The land at the centre of the study area is generally estate land and agricultural farmland and uninhabited.

In order to assess the most appropriate solution, the study area was split down into seven corridors which would allow for a SWOT analysis to be compiled assessing the opportunities and constraints for each option.

The corridors were considered by which would provide greatest connectivity between Avoch and Munlochy. Our appraisal also takes into consideration the core design principles detailed in the Sustrans Design Guidelines, including safety, directness, coherence, comfort, attractiveness, adaptability, accessibility, socio-economic, and deliverability.

These were also checked against available constraint mapping to greater understand how suitable each corridor is.

It was always considered that the final route could be made up of more than one corridor.

The route also needs to be considered fundable by Sustrans and would therefore need to be traffic free, no less than 3m wide and adjacent to the adopted road network such that The Highland Council (THC) would adopt the network once complete.

In special circumstances, THC would adopt a remote footpath which would then change the funding criteria, as such we have explored this as an option but would need confirmation from THC and Sustrans that this was acceptable.

Figure 19: Route assessment overview

4.1.1 Corridor 1

Corridor 1 was selected to provide the most direct and coherent connection between Munlochy and Avoch. The extents of the route can be seen in Figure 20 below:

Figure 20: Corridor 1

As can be seen from Figure 20, Corridor 1 runs in a generally west-east direction. The route was defined by keeping to the A832 and any existing tracks that run alongside it.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route and, due to the chosen alignment, it would be out with any of the areas shown as potential flood risk on the SEPA mapping.

This route is 5.3km in length and would require a 3m wide shared path to be constructed on one side of the road with a 1.5m separation zone. It is considered that the south side of the A832 would be more appropriate as there are less side roads / accesses to cross and users would not need to cross the A832 to get into Munlochy.

Figure 21 below shows an example of a shared use path with verge separation adjacent to the public road.

Figure 21: Example of a shared use path

Further justification for preferring the southern side of the road include the ancient woodland designation of the woodland within Rosehaugh Estate.

The main constraint perceived with the implementation of this route is the issue of land ownership as land acquisition would be required to implement this option.

4.1.2 Corridor 2

Corridor 2 was considered as an option for connection between Munlochy and Avoch which would provide an off carriageway facility forming a remote path through Rosehaugh estate before connecting on to Corridor 1 half way along the A832. The extents of the route can be seen in Figure 22 below:

Figure 22: Corridor 2

As can be seen from Figure 22, Corridor 2 runs in a generally west-east direction with a small divergence to the north. The route was defined by initially keeping to the A832 before diverting through the Rosehaugh Estate. This route, including the connection along the A832 is 5.5km in length.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route and, due to the chosen alignment, it would be out with any of the areas shown as potential flood risk on the SEPA mapping.

The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. Additionally, there would be a requirement to construct a short section of the route on agricultural land before it joins existing infrastructure. Use of the agricultural track alignment would require the path to be constructed to a higher standard to allow for the occasional agricultural vehicle to drive along it or a request would need to be made for the estate to amend its operations to remove traffic from the route.

Comfort is a challenge for this route as the start of the route is at the top of a very steep section of road which would make it unappealing to a number of users who would be more likely to stay on the A832 as it is more direct and less steep.

A crossing would need to be constructed to allow users to cross the A832 safely.

The eastern section of this route has the same constraint as Corridor 1 as it shares some of the same alignment. Land acquisition would be required to implement this option.

4.1.3 Corridor 3

Corridor 3 was considered as an option for connection between Munlochy and Avoch which would provide an off carriageway facility forming a remote path. The route would follow existing tracks and field boundaries which would be upgraded to a sealed path construction. The extents of the route can be seen in Figure 23 below:

Figure 23: Corridor 3

As can be seen from Figure 23, Corridor 3 runs in a generally west-east direction. The route was defined by trying to run parallel to the south of the A832. This route, including the connection along the A832 is 5.1km in length.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route and, due to the chosen alignment, it would be out with any of the areas shown as potential flood risk on the SEPA mapping.

The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. There would also be a requirement to construct the route through agricultural land as footways currently only exist for part of the route.

The eastern section of this route has the same constraint as Corridor 1 as it shares some of the same alignment. Land acquisition would be required to implement this option.

4.1.4 Corridor 4

Corridor 4 was selected to provide an alternative route from Munlochy to Avoch by avoiding the A832 and joining Corridor 3. The route can be seen in Figure 24 below:

Figure 24: Corridor 4

As can be seen from Figure 24, Corridor 4 runs in a generally west-east direction, though it meanders. The route was defined by attempting to connect Munlochy to Corridor 3 while avoiding the A832 entirely.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route.

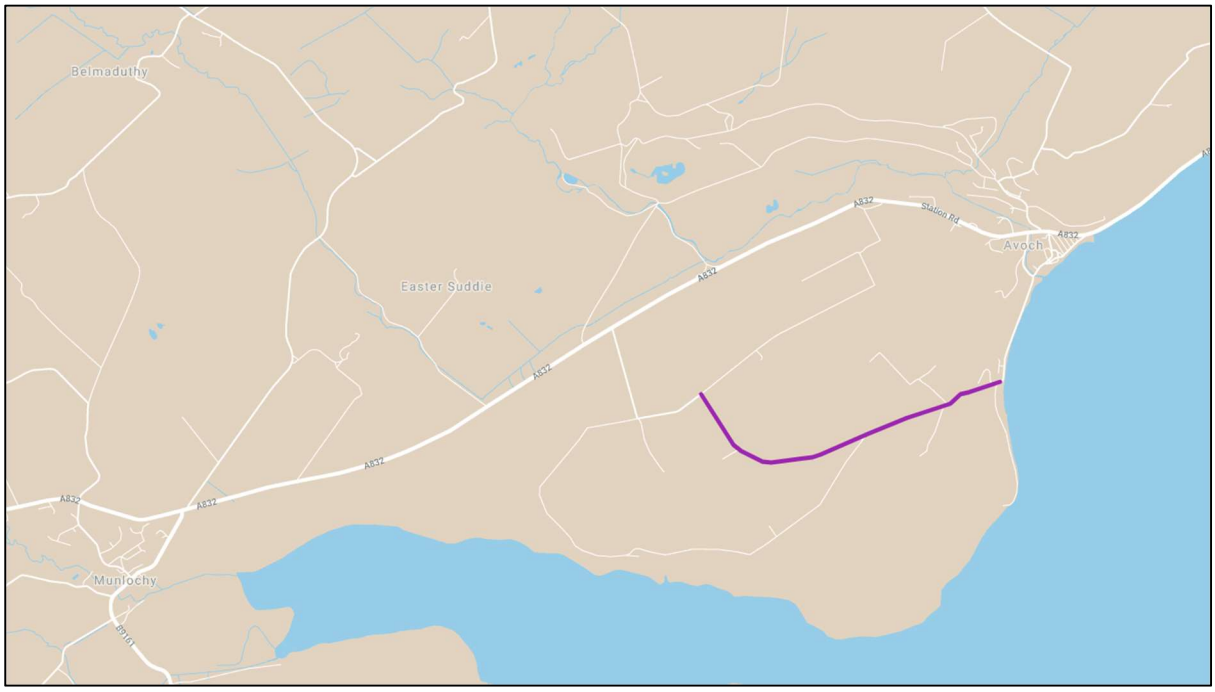
The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. There would also be a requirement to construct the route through agricultural land as footways currently only exist for part of the route. Any design would need to be considerate to the possibility of flooding as this option skirts Munlochy Bay. The SSSI at Munlochy bay may make

Land acquisition would be required to implement this option.

4.1.5 Corridor 5

Corridor 5 was selected to provide an alternative route from Munlochy to Avoch by following Corridor 3 before finishing on the southern side of the village of Avoch. The route can be seen in Figure 25 below:

Figure 25: Corridor 5



As can be seen from Figure 25, Corridor 5 runs south from Corridor 3 before heading east. The route was defined by trying to provide a second possibility for the Avoch-end of Corridor 3.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route. It would not be necessary to construct entirely new infrastructure for this short section as it would follow existing transport routes.

The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. Land acquisition would be required to implement this option.

4.1.6 Corridor 6

Corridor 6 was selected to provide an alternative route from Munlochy to Avoch by avoiding the eastern section of the A832 and joining Corridor 2. The route can be seen in Figure 26 below:

Figure 26: Corridor 6

As can be seen from Figure 2, Corridor 6 initially runs in a generally northeast direction, though it then veers sharply to the southeast. The route was defined by attempting to connect Munlochy to Corridor 2 while avoiding the A832 entirely. The full route would be 6.6km in length.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route.

The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. There would also be a requirement to construct the route alongside a very narrow rural road with narrow verges. Any design would need to be considerate to the possibility of flooding as this option runs alongside Roskill Burn.

Comfort is a challenge for this route as the route is along a very steep section of road which would make it unappealing to a number of users who would be more likely to stay on the A832 as it is more direct and less steep.

Land acquisition would be required to implement this option.

4.1.7 Corridor 7

Corridor 7 was selected to provide an alternative route from Munlochy to Avoch by avoiding the A832 and linking Corridors 2 and 6. The route can be seen in Figure 27 below:

Figure 27: Corridor 7

As can be seen from Figure 27, Corridor 7 runs in a generally west-east direction, though it meanders. The route was defined by attempting to link Corridors 6 and 2 while avoiding the A832 entirely.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and Avoch. It would also provide the opportunity to create a segregated traffic free cycle and walking route which is remote from the live carriageway

The main constraint perceived with the implementation of this route is that it does not provide the most direct or coherent connection between the two communities. There would also be a requirement to construct the route through agricultural land as footways currently only exist for part of the route. Any design would need to be considerate to the possibility of flooding as this option runs alongside Rosehaugh Burn.

Land acquisition would be required to implement this option.

4.1.8 Corridor 8

Corridor 8 was selected to provide an active travel route from Munlochy to the War Memorial and Drumderfit Forest Trail. The route can be seen below in Figure 28.

Figure 28: Corridor 8

As can be seen from Figure 23, Corridor 8 runs in a generally north-south direction, though it meanders. The route was defined by attempting to link Munlochy village to the War Memorial and Drumderfit Forest Trail off the B9161.

The main opportunities which could be realised for this route are that it would provide good connectivity between Munlochy and the forest trail. It would also provide the opportunity to create a segregated traffic free cycle and walking route running parallel to the public road.

There is potential to reallocate road space at the south bound slip road at the war memorial.

The main constraint perceived with the implementation of this route is that of land ownership.

4.2 Concept Design

On the 8th of November 2019, a meeting was held with members of Transition Black Isle to allow Pell Frischmann to ascertain details of the local area and discuss options.

A site visit was then carried out the same day to allow Pell Frischmann to obtain a detailed appreciation of the study area and to confirm the findings of the desktop study. This visit included driving the existing corridors and a video recording of each.

In order to develop the designs Ordnance Survey mapping was obtained of the full study area, this included OS Mastermap and OS 5m DTM CAD files. This allowed for the concept designs to be developed whilst observing the layout of the local area and also topography.

The seven corridors were drawn up considering the findings of the site visit and are described in more detail below.

All options were considered with a 3m wide sealed shared path, if adjacent to a road with national speed limit then a 1.5m verge separation would be required, if a remote provision this would not be required.

4.2.1 Corridor 1

Corridor 1 is proposed to run from the eastern limits of Munlochy to the western limits of Avoch in a northeast-southwest direction, following the southern side of the existing A832. The A832 is fairly straight, instead only changing direction 1.5km east of Munlochy and again slightly under 3km west of Avoch.

A disused railway runs alongside the A832 in short sections close to Munlochy (approximately 800m overall): the two are separated by a culvert with the railway line sitting slightly higher than the road. There is opportunity here to develop the disused railway line and create walking/cycling infrastructure along it. This would ensure adequate separation of traffic and pedestrians/cyclists.

This corridor section would provide views over Munlochy Bay and placemaking could add value. For example, by providing benches for viewing the bay and information boards with details of local flora and fauna, the route would not only be a commuter system but also an attraction for tourists and visitors. This could be in conjunction with Scottish Natural Heritage.

Figure 29: Photo showing the disused railway line

The land on either side of the A832 is fairly flat and agricultural, thus where the disused railway ends it is proposed that the cycle/walking route could be built into this land as opposed to expensive carriageway realignment. This would require 3m of facility with a 500mm separation between itself and the carriageway.

This will require land ownership discussions as from mapping the adopted land on either side of the road does not exceed 3m. We are currently in discussion with The Highland Council in regard to confirming their position in respect to the extent of the adopted road network.

Electric cables cross the A832 at five points, they appear to be high enough so as not to be an issue, though care with clearance will be taken in these areas.

There is no street lighting along the A832, though this is to be expected as it is signed as national speed limit. Low level lighting of the route will be considered at later stages.

The corridor would end at the junction of the A832 and Station Rd in Avoch, after which point already exists a footpath for pedestrians, though cyclists would have to use the road. As it enters a 30mph zone prior to this, it is safer for cyclists to travel on-road.

As the majority of this route could follow The corridor would be mostly level, the steepest gradient being 7% and occurring over 45m. This would be an ideal route for those with mobility issues.

Figure 30: Current footpath system at the western end of Avoch

4.2.2 Corridor 2

Corridor 2 initially follows the north side of the A832 before turning up the eastern branch of the C1027 for 60m and then turning east to follow the line of Suddie Burn for 830m. After this point the corridor would join the western entrance road to the Rosehaugh Estate and follow this through to Rosehaugh Estate Drive in the north of Avoch.

A crossing over the C1027 would be required, along with building into agricultural land as the adopted boundary would not be large enough to accommodate the walking/cycle path.

Figure 31: The eastern branch of the C1027 just off the A832

To run alongside Suddie Burn, land would need to be acquired as there is currently no existing infrastructure for walking or cycling.

Where the corridor reaches the Rosehaugh Estate entrance road, there is also no suitable infrastructure as the estate 'roads' have been used mainly for farm machinery. The track can become muddy in winter and cluttered with fallen leaves due to the numerous trees lining each side. However, it is wide and relatively straight, with any changes in direction gradual, thus making it ideal for development as a walking/cycle path if it was upgraded to a sealed surface.

An agreement with the estate over access for farm machinery and any vehicles travelling to the Estate would need to reached as there is a requirement to provide a traffic free route, but there is enough width to accommodate both an upgraded carriageway and an active travel route.

Figure 32: Western approach track for Rosehaugh Estate

A footpath on either side of the road exists at the junction of Rosehaugh Estate Drive and Fletcher Gardens.

The route keeps a steady gradient for the full length, inclining slightly in the middle before dropping slowly. This makes it ideal for those with mobility issues.

4.2.3 Corridor 3

Corridor 3 proposes to follow the same route as Corridor 1 for 1.2km before diverging where the road curves northeast, instead travelling due east through farmland and skirting a forest. This would require a considerable stretch of land that would have to be acquired, with no existing infrastructure to build upon or upgrade.

The corridor would then join onto a farm track with overgrown trees on either side. The track itself is narrow, though there is potential to implement a walking/cycling route on the northern side of the track to maintain agricultural vehicle access, if required.

Figure 33: Photo showing farm track joined by Corridor 3

This farm track runs for 1.9km before ending at a house access track. It is proposed that the corridor would then cut through agricultural land to meet South Station Road. Again, this requires substantial land purchase and implementation of infrastructure.

This corridor is not ideal for those with mobility issues: the gradients are steep in sections as the corridor crosses two hills.

4.2.4 Corridor 4

The proposal for Corridor 4 is to start at the junction of Station Brae and Millbank Road before following river alignment to skirt Munlochy Bay.

There are two options for this section, either to construct this section in typical footway construction or to install a recycled boardwalk adjacent to the Bay.

The boardwalk proposal would negate the requirement for additional drainage and road works. They can be installed without foundations and are generally more environmentally friendly. We have been advised that they are also maintenance free for 30+ years.

For the sections where the route passes the watercourses and lochs it is considered that the board walk option would be preferable to infilling gabion retaining structures and using standard footway construction.

There is a strong argument that the boardwalk could be extended the full length of this section. This is primarily to ensure that it is above any high-water levels and also to avoid and construction contamination going into the loch

The corridor would then diverge and travel northeast to join Corridor 3.

Where the corridor follows the Bay, the gradients are low and ideal for those with mobility issues, though to join Corridor 3 the route inclines sharply, making it less suitable or comfortable.

Figure 34: Photo showing Munlochy Bay in the general direction that Corridor 4 would travel

4.2.5 Corridor 5

Corridor 5 proposes to follow the same route as Corridor 3 for 1.9km before turning to follow a farm track travelling south and then east to meet Ormonde Terrace in the south of Avoch.

This corridor has an initial steep incline before a general downhill gradient towards Avoch.

While there is existing infrastructure to follow, it is narrow (circa 3m) for most of the length. This requires cars to pull over into passing places to allow opposing traffic through, leaving little space for a walking/cycle route to be built within the adopted road boundary, third party land would therefore be required..

Figure 35: Initial incline of Corridor 5

4.2.6 Corridor 6

Corridor 6 proposes to follow the alignment of the western branch of the C1027 for 1km before turning sharply southeast to travel down the unnamed road to Easter Suddie and meeting with Corridor 1 on the A832.

The western branch of the C1027 is quite narrow and populated with passing places, though on either side is lined with agricultural land. Thus, land purchase would be required to build alongside it. It is also initially steeply uphill in gradient, making it unsuitable and unattractive for those with mobility issues.

Figure 36: Western branch of the C1027 travelling northeast

The western branch of the C1027 is also narrow and is lined with trees with narrow verges on either side in many places.

Figure 37: Unnamed road to Easter Suddie

4.2.7 Corridor 7

Corridor 3 proposes to link Corridors 2 and 6 by cutting through farmland at Easter Suddie. This would require substantial land purchase and building of infrastructure as a farm track only exists for 500m after diverging from the eastern branch of the C1027.

The corridor is undulating with a steep decline travelling towards Corridor 2 from Corridor 6.

The farm track is narrow (circa 3m) and has narrow verges on either side (no wider than 2m), making it unsuitable for a standard walking/cycle path to be built without land purchase.

Figure 38: Farm track at Easter Suddie

4.2.8 Corridor 8

Corridor 8 proposes to link the village of Munlochy with the War Memorial and Drumderfit Forest Trail. Through the village of Munlochy there is existing footpath, though this ends at the church just north of the speed limit change.

Figure 39: Photo showing the end of existing footpath at the church

The route then follows existing infrastructure and requires the building of a walking/cycle route on the eastern verge of the B9161. It is mainly level in gradient with a slow decline travelling south from Munlochy.

Thick vegetation lines most of the eastern verge but it appears to be wide enough (circa 3m) to accommodate an active travel route.

There is a bridge prior to the forest in which traffic control or calming will need to be in place to allow for pedestrians and cyclists to cross. This would avoid the installation of a new bridge which would be costly.

Upon reaching the memorial, the route would diverge from the B9161 to follow an unnamed road towards the Drumderfit Forest Trail. The unnamed road is narrow (circa 3m) and surrounded on both sides by trees. Land purchase and extensive land reprofiling would potentially be required to install an active travel route in this section, as the adopted boundary is only around 2m wide.

Alternatively the final section could see road space being reallocated by closing off the south bound slip road

Figure 40: Photo showing road south of Munlochy to War Memorial and Drumderfit Forest

4.3 Outline Design

The outline design is a developed version of the concept design and incorporates the suggestions of the client and the route does not deviate or differentiate from the concept design.

The outline design will be progressed in more detail one a final corridor has been agreed.

5 Trip Generation

5.1 Local Area

The proposed active travel path runs through both the Knockbain Community Council and the Avoch and Killen Community Council.

5.2 Census Data

5.2.1 Travel to Education

Travel Partners taken from the 2011 Scottish Census data show that 36% of the Highland Population walk to their place of Study, the most popular transport mode. Other forms such as cycling is recorded at 2.7%. 23% use cars and bus transport use is 25%.

Figure 41: 2011 Scottish Census data for travel to Education

	Highland Council Area 2011	Scotland 2011
All people aged 4 and over studying	37790	996282
% Car (including passengers car pools and taxis)	23.1	22.3
% Train	0.5	2.9
% Bus	25.3	21.5
% On foot	36.3	39.1
% Other	2.7	1.7
% Studies mainly at or from home	12.2	12.4

Based on the local travel statistics outlined above, there appears to be significant potential to encourage greater levels of active travel. Walking and cycling are similar and slightly higher than the national average, respectively. This suggests that communities are willing to use active travel as a means of transport to places of study and that if facilities are provided, they will be used.

5.2.2 Travel to employment

Travel Partners taken from the 2011 Scottish Census data show that 11.5% of the Highland Population walk to their place of employment. Other forms, such as cycling, is recorded at 4.5%. 62.5% still rely on car use. Bus transport is only 4.2%.

Figure 42: 2011 Scottish Census data for travel to Employment

	Highland Council Area 2011	Scotland 2011
All persons aged 16 to 74 who were in employment (excluding full-time students)	112631	2400925
% Car (including passengers car pools and taxis)	62.5	62.4
% Train	1.4	3.7
% Bus	4.2	10.0
% On foot	11.5	9.9
% Other	4.5	3.1
% Works mainly at or from home	15.8	10.8

Based on the local travel statistics outlined above, there appears to be significant potential to encourage greater levels of active travel. Walking and Cycling are slightly above the National Average, which suggests that active travel is very much a part of the culture. However, there is significant potential to improve on these numbers.

5.3 Cycling Action Plan for Scotland (CAPS, 2017-2020)

This document sets out the Scottish Government's vision for cycling in Scotland:

- We remain committed to the shared vision of 10% of everyday journeys by 2020, and positively promote modal shift away from vehicle journeys which will over time reduce car use for local trips;
- We will continue to support local authorities and Regional Transport Partnerships in developing local and regional active travel plans/strategies;
- We will support the six remaining Scottish cities in introducing "Bike Life" reports, similar to the City of Edinburgh's Bike Life report, with additional support through Sustrans who led the project across the UK during 2015/2016;
- We will continue to support local authorities in building community links to the highest standard, including re-allocation of road space in favour of cycling and walking through the Community Links PLUS design competition; and
- As part of the Community Links PLUS competition, we will encourage those bidding to include sufficient and realistic levels of resource funding to enable the best possible infrastructure to be delivered on time and to budget.

6 Carbon Balance

Having reviewed the Carbon reduction offered by Sequestration of Carbon for an Uncultivated Field, it is anticipated that the route would reach carbon balance following a reduction of less than 30 vehicle trips per year.

This is based on the use of recycled material to construct the cycle path and then calculating the carbon offset from replacing a car journey to a cycling journey.

Figure 43: Carbon data

	Carbon Reduction per km per year	Source
Sequestration of Carbon for an Uncultivated Field	595kg CO2	https://www.farmcarbontoolkit.org.uk/carbon-calculator-resources
Carbon reduction by changing from a car to bike	22kg CO2	www.cyclescheme.co.uk

Based on the cyclescheme.co.uk the annual carbon reduction per year by removing 1 car trip for the 4mile trip between Avoch and Munlochy is 143kg CO2

7 SWOT Analysis

Table 7-1: Route Appraisal

Corridor 1		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Lighting could be provided along full route.	3
Directness	- Direct link between the centres of the two communities of Avoch and Munlochy. - Route has no detours from the existing A832, the most direct link between the two villages.	3
Coherence	- The route is wholly coherent as it is continuous and recognisable. - Route will be appropriately signed.	2
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - The entirety of the route is flat and as such the gradient is consistently low.	3
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them. - Tying-in with Scottish Natural Heritage could create very useful space overlooking features such as Munlochy Bay.	3
Adaptability	- The route can act as an expansion to an existing core path for pedestrians that runs to the east of Munlochy along a short section of dismantled railway. - The route can also open up options to create a wider active travel network on the Black Isle.	3
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route will be accessible for all user groups.	3
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	2
Deliverability	- The only barrier to this route is land ownership.	-1
Total		**31**
Corridor 2		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832 or through the Rosehaugh Estate.	2

Directness	- Route diverges from existing direct link between villages but runs relatively parallel to it. The divergence would increase journey time between the communities.	1
Coherence	- The route is not wholly coherent due to crossings, though it does connect to existing traffic routes and so is recognisable.	0
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - The entirety of the route is flat and as such the gradient is consistently low.	2
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them. - Tying-in with Scottish Natural Heritage could create very useful space overlooking features such as Munlochy Bay. - Directing the route through the Rosehaugh Estate provides an enjoyable scenic route.	3
Adaptability	- The route can act as an expansion to an existing core path that runs through the Rosehaugh Estate.	2
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route is fairly level and so will be accessible for all user groups.	2
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	2
Deliverability	- The only barrier to this route is land ownership.	-1
Total		**13**
Corridor 3		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832.	1
Directness	- Route diverges from existing direct link between villages but runs relatively parallel to it. The divergence would increase journey time between the communities.	-1
Coherence	- The route connects to existing traffic routes but often does not for large sections, making it somewhat coherent.	0
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - The route is mainly level with two hills.	1
Attractiveness	- The design will have a positive impact on the surrounding environment.	2

	- The construction is an opportunity to improve placemaking by creating both place and a method to access them. - Tying-in with Scottish Natural Heritage could create very useful space overlooking features such as Munlochy Bay.	
Adaptability	- The route can act as an expansion to an existing core path that runs to the east of Munlochy along a short section of dismantled railway.	1
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route is steep and travels over two hills so is not fully accessible for all user groups.	-2
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	2
Deliverability	- The only barrier to this route is land ownership.	-2
Total		**2**
Corridor 4		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832.	1
Directness	- Route runs parallel to most direct link, though journey time is increased due to meandering nature.	0
Coherence	- Route is not coherent as it does not follow existing travel routes.	-1
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - Route is initially level travelling west to east, though sharply inclines to join the Corridor 3 route.	0
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them. - Tying-in with Scottish Natural Heritage could create very useful space overlooking features such as Munlochy Bay.	2
Adaptability	- The route could be adapted into a wider Black Isle active travel route.	2
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route has a steep incline towards the end and so is not accessible for all user groups.	-1
Socio-economic	- This provision, along with wider enhancements, will improve tourism.	1

	- Introducing school children to active travel at an early age has proven health benefits throughout life.	
Deliverability	- The only barrier to this route is land ownership.	-1
Total		**3**
Corridor 5		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832.	1
Directness	- Route initially runs parallel to main route and then diverges perpendicularly before running parallel again.	-1
Coherence	- Route is fairly coherent as it follow existing travel routes with no crossings.	1
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - Route is fairly level along the Corridor 3 route with two gradual hills before declining slowly along the Corridor 5 route.	0
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them. - Tying-in with Scottish Natural Heritage could create very useful space overlooking features such as Munlochy Bay.	2
Adaptability	- The route could be adapted into a wider Black Isle active travel route.	2
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route declines sharply towards the end and so is not accessible for all user groups.	-1
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	1
Deliverability	- The only barrier to this route is land ownership.	-2
Total		**3**
Corridor 6		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832.	1
Directness	- Route runs north before turning south to join Corridor 1.	-1
Coherence	- Route is fairly coherent with no crossings.	0

Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - Route begins with a gradual incline when travelling west to east before levelling and then declining sharply to re-join Corridor 1.	0
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them.	2
Adaptability	- The route could be adapted into a wider Black Isle active travel route.	2
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre. - The route travels over a hill and so it not easily accessible for all user groups.	-1
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	1
Deliverability	- The only barrier to this route is land ownership.	-2
Total		**2**
Corridor 7		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Small section of completely off-road pathway dedicated to cyclists and pedestrians. - Lighting would not be possible off the A832.	0
Directness	- Route is not entirely direct as it travels north and south between Corridor 2 and 6 routes.	1
Coherence	- Route is not entirely coherent as it does not follow existing travel routes.	-1
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - Route links to the Corridor 6 route in the west and Corridor 2 route in the east. Travelling from west to east the route is mainly level though with a sharp decline towards the Corridor 2 route.	0
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them.	2
Adaptability	- The route could be adapted into a wider Black Isle active travel route.	2
Accessibility	- Accessibility to the route from the west and east is good as it connects into existing footways in the village centre.	-1

	- The route has a steep decline towards the end and so is not accessible to all user groups.	
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	1
Deliverability	- The only barrier to this route is land ownership.	-2
Total		**2**
Corridor 8		
Design Principle	**Information**	**Score (+/- 3)**
Safety	- Completely segregated active travel path offering safety from other road users. - Lighting would not be possible off the A832.	1
Directness	- Route is entirely direct as it travels from Munlochy to the War Memorial and Forest without having to cross carriageway.	3
Coherence	- Route is entirely coherent as it follows existing travel routes.	3
Comfort	- Design will dramatically improve facilities for cyclists and create facilities for walkers, providing a smooth and completely segregated surface without the interruption of on-road vehicular traffic. - The route declines slightly when leaving Munlochy for the War Memorial	2
Attractiveness	- The design will have a positive impact on the surrounding environment. - The construction is an opportunity to improve placemaking by creating both place and a method to access them.	3
Adaptability	- The route could be adapted into a wider Black Isle active travel route.	3
Accessibility	- Accessibility to the route is good as it connects into existing footways in the village centre. - The route does have a slight hill when leaving Munlochy and so is not ideal for all user groups.	1
Socio-economic	- This provision, along with wider enhancements, will improve tourism. - Introducing school children to active travel at an early age has proven health benefits throughout life.	2
Deliverability	- The only barrier to this route is land ownership.	-1
Total		**17**

8 Conclusion and Recommendations

Transition Black Isle (TBI) applied in 2014 to SUSTRANS' for funding of a feasibly study through the Community Links Programme to look into options of connecting Avoch to Munlochy. This was completed in September 2014. TBI has now secured further funding through the SUSTANS' Places for Everyone scheme which replaced the Community Links Programme to review routes between the two villages. This programme aims to improve the infrastructure for cycling and walking and by doing so, linking the places people live in with the places they want to get to.

Pell Frischmann (PF) has been commissioned by Transition Black Isle to undertake a Feasibility Study into a walking and cycling route between Avoch and Munlochy, located on the Black Isle. As part of the feasibility work, Pell Frischmann carried out an assessment of the study area, highlighted interventions which could offer benefit to the community, and engaged with the client.

Pell Frischmann will also engage with key stakeholders to ensure that the appropriate permissions, such as landowners' support and Local Authority approvals are secured.

The Feasibility Study has been prepared to help inform Transition Black Isle on the viability associated with the provision of a segregated active travel system. The report identifies the design criteria applied to the scheme and what is achievable.

The aim of the study is to ascertain the feasibility of establishing a functional and sustainable dual-purpose cycle/walking route between the communities of Avoch and Munlochy on the Black Isle.

The key objectives are to:

- Provide a safer route for both communities and their facilities;
- Encourage people to become more actively involved in physical activity;
- Encourage children and others learn to cycle and cycle safely;
- Enhance the health of children and adults;
- Help children to gain independence and confidence;
- Help parents to have confidence in children's ability to use bicycles;
- Reduce traffic congestion and pollution;
- Improve community spaces; and
- Provide an inclusive all-abilities segregated walking and cycling route.

Corridor 1 scores highest in terms of providing a route that meets the objectives of the brief and also the funding criteria set by Sustrans. The viability of any route will come down to the willingness of landowners to sell small sections of land, once discussions have concluded, the findings will be incorporated into this report.

For the initial options appraisal carried out by Pell Frischmann, it is evident that there is a viable solution to provide a route which meets the scheme objectives and it is recommended that the site is taken forward to outline design.

Pell Frischmann recommend that the following steps are carried out to ensure smooth progression through to detailed design:

- Ongoing engagement with Sustrans;
- Ongoing engagement with all stakeholders and land owners;
- Undertake a topographical survey;
- Undertake any environmental studies relating to the construction of the scheme; and

- Undertake geotechnical testing of areas where footway construction is to be used;