



Subsea Tunnels Are we crazy?

**UNST & YELL
TUNNELS
SHETLAND**

Connecting our islands.
Empowering our communities.



UNST TUNNEL ACTION GROUP



Foreword

Subsea Tunnels Are We Crazy? This may seem a strange title for a report from groups working to make tunnels a reality for their islands. However, the inspiration for this title came from a geologist we met in the Faroes who said...

Back in the 1980's when we first started to speak about subsea tunnels, I thought we were crazy, but look what we've achieved.

We hope that, shortly, we will be able to say something similar about our islands.

There is nothing new about underwater tunnels. The first were built in the 19th century, with the UK leading the way. The oldest underwater tunnel in the world was constructed under the Thames in 1843, and at the time was described as 'the eighth wonder of the world'. The world's oldest underwater vehicle tunnel is also located in London and opened in 1897, when the Queen of the day was Victoria.

In the last 180 years around 200 underwater tunnels have been built worldwide, with some being used for water and electricity supply, but most for road or rail connections. However, in recent times, other than the Channel tunnel which opened in 1994, the UK appears to have fallen behind others in terms of tunnel building ambition and expertise. While Scandinavia, Asia and North America have forged ahead with domestic and international tunnel projects, the UK has not, and perhaps it is time that this was addressed.

Whilst tunnels between Unst, Yell and Mainland Shetland may not be considered major engineering projects within the context of worldwide tunnel development, they would provide a very good starting point for developing the methodology, skills and experience with which to cultivate this form of engineering within our nation.

Coupled with this, we feel tunnels will provide opportunities for growth and development of our communities and the national economy, as well as assist in our journey towards carbon neutrality, and help rebalance the incessant centralisation of both services and population.

We hope you will take the time to read this report and that it will help you form your own opinion in relation to tunnels to Unst and Yell. We have tried to keep the report simple and understandable, and if you require any further information or clarification, please feel free to contact us.

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TAG representatives visited the Faroes between 5th and 9th October 2023. We are very grateful to all those we met for the superb hospitality and providing such comprehensive information. Particular thanks to Articon for hosting the visit, and LBF Engineering, Faroe Islands Geological Survey, Faroe Islands Subsea Tunnel Company, and Faroe Islands Agency for Public Works for their enlightening presentations and discussion in relation to the investigations required, construction, funding and evaluation of tunnel projects. Thanks also to the Mayor and members of the Sands Community in Sandoy for their generous hospitality and open discussion, as well as all others we met with and discussed the impact of tunnels on island life, both socially and economically.

1. Faroes

The photo on the cover of this report was taken by TAG members on their recent trip to the Faroes. This shows the entrance to the Streymoy to Sandoy tunnel. When opened on 21st December this year, it will become the Faroes' 22nd tunnel and the islands 4th subsea tunnel.

The first tunnel in the Faroes opened 60 years ago in 1963. Since then, the Faroese have prioritised linking communities using roads, tunnels and bridges, with around 11% of the entire Faroese road network now underground. Extending the road network has tied the islands together, improved mobility both socially and economically, providing greater development opportunities and a wider workforce pool. This has played a key role in the welfare of the islands, easing everyday life for people and businesses as well as creating economic growth.

The map below shows the current subsea tunnel network in the Faroes.



The map above shows that the first subsea tunnel in the Faroes was completed in 2003. This tunnel linked the main island of Streymoy with Vagar where the islands airport is located. The Nordoy tunnel which opened in 2006 connected Eysturoy to the island of Bordoy in the North Isles.

A tunnel between Eysturoy and Streymoy opened in 2020 and shortened the travel distance to Torshavn from about 55 km to 17 km. This shortened driving time from 64 minutes by bridge to 16 minutes by tunnel. This tunnel also contains the world's first undersea roundabout, located where the tunnel splits giving drivers the option of surfacing at two separate points on the island of Eysturoy.

As discussed, the Streymoy to Sandoy tunnel will open in December. There is also a further subsea tunnel proposed to the island of Suduroy, which is in the early planning stage.

Eysturoy Tunnel Roundabout



Details of the length of the four subsea tunnels in the Faroes are set out in the table below.

Subsea Tunnel	Year Completed	Distance (km)
Streymoy to Vagar	2003	4.9
Eysturoy to Bordoy	2006	6.2
Streymoy to Eysturoy	2020	11.4
Streymoy to Sandoy	2023	10.8

For comparison the current estimated length of tunnels between Unst, Yell and the Shetland Mainland are...

- Bluemull Sound (Unst to Yell) 2.0 – 2.5 km
- Yell Sound (Yell to Mainland) 4.5 – 5.0 km

2. Geology

The overwhelming message we received in the Faroes was that if you are serious about any tunnelling project, the first thing you need to do is map the geology. This was very good to hear, as geological investigations form the cornerstone of the work we intend to undertake, in relation to tunnels to Unst and Yell.

Whilst the geology of Faroes differs from that of Shetland, the underlying principles of the work to be undertaken, and data to be collected, remain the same.

Detailed investigation to fully understand the ground conditions is crucial to minimising the risks of tunnelling projects. The geological conditions affect tunnel design, construction, and maintenance. Therefore, it is essential to have accurate and reliable geological data for the site.

Geological mapping is imperative to help to select the optimal alignment, depth, and cross-section of the tunnel, as well as to choose the most suitable tunnelling method, equipment, and materials. Furthermore, it can help provide more accurate cost and time estimates, as well as reduce the risk of the tunnelling project.

It also offers additional advantages, such as improving safety by reducing the risk of geological hazards, reducing costs by optimising resources and minimising waste, and accelerating the process by streamlining planning and execution.

The process of geological investigation detailed by the Faroe Islands geological survey is detailed below.

- Geological mapping
 - The geology – the stratigraphy
 - Fractures and fracture zones
 - Rock mass quality
- Seismic surveys
- Seabed mapping / multibeam
- Drone photos
- Geotechnical cores and logging

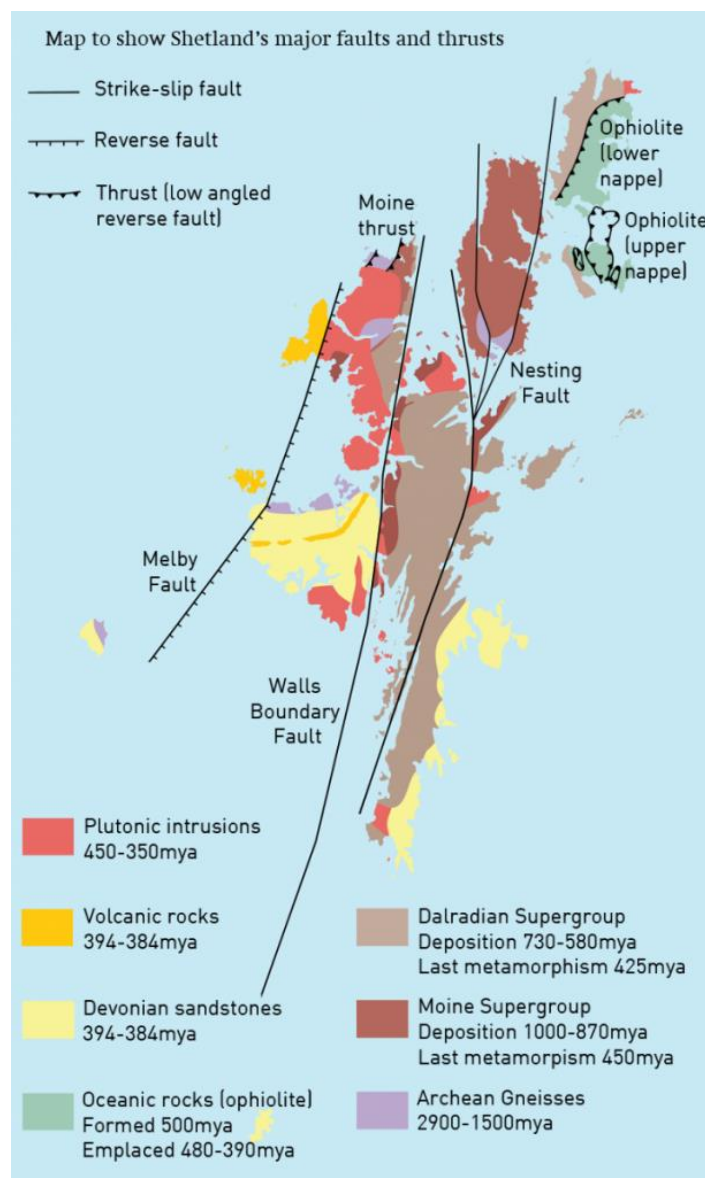
It is believed that previous work may have been undertaken by other parties which could assist with these geological investigations, and we therefore intend to approach the following bodies for details and copies of any previous studies undertaken. This includes:

- Shetland Islands Council – over the last 30 years
- Oil industry – including work relating to the port of Sullom Voe
- Renewables industry – including tidal generation projects
- Fisheries industry – including catching and aquaculture
- Service providers – including those laying subsea cables

Our target during the initial phase of our fundraising is to undertake the geological investigations detailed above up to the geotechnical cores and logging. Should we achieve

our initial target we will then move forward to seek funding for geotechnical cores including bore holes and horizontal drilling on both sounds. This should provide the necessary data for any potential developer to take the project forward.

The map below shows a basic outline of the major geological faults around Shetland. This includes two offshoots of the Nesting fault, one of which is located between Yell and the island of Bigga, and another which is located in Bluemull Sound close to the Yell side. Faults are commonly encountered during tunnelling projects. However, these are areas which will require particular investigation to better understand the geological conditions and reduce the risks of any tunnelling project.



Source Shetland Amenity Trust

3. Social

As a result of the Faroese Government’s vision for increased connectivity, following the opening of the Sandoy tunnel in December, 88% of the Faroese population will be linked through the same road network.

Previous studies of the societal effects and impacts of subsea tunnels in the Faroes have found that they reduced travel times, increased connectivity and mobility, dissolved spatial boundaries, strengthened mutual dependency between communities, and improved opportunities for repopulation and access to services and amenities.

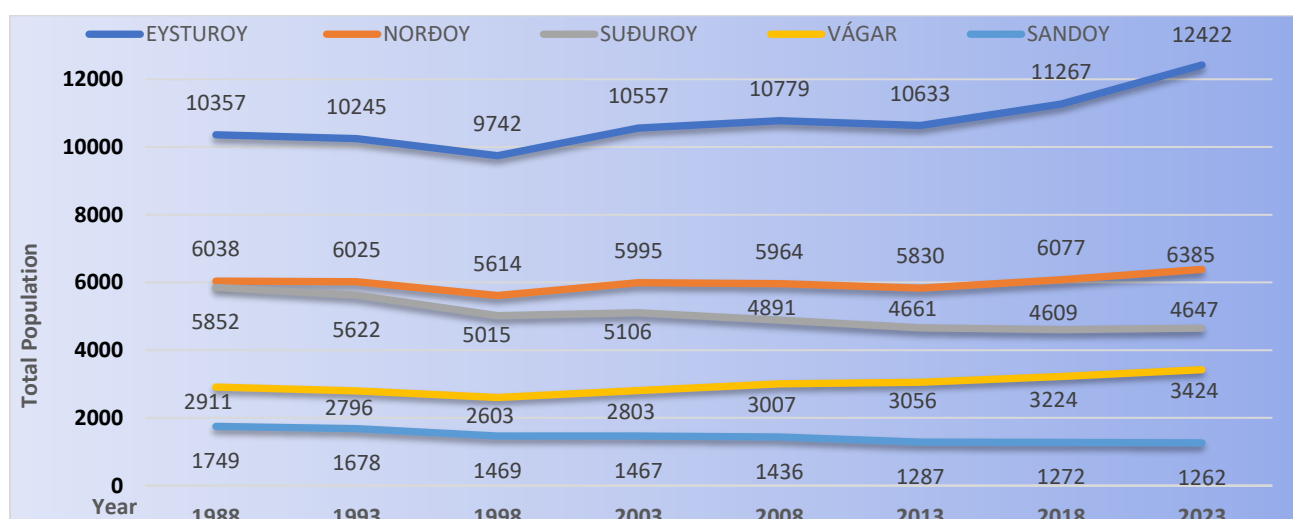
Whilst sceptics worried that the tunnels would suck the lifeblood out of island communities, the opposite appears to be occurring. Attracted by more affordable housing, better access to the labour market and a more rural lifestyle, working age people are moving to the Faroes and away from the capital into island areas, helping reverse depopulation. Where before an island location may have come with certain restrictions, workers now have equal access to jobs, as well as medical services and leisure and social activities, thus making them more likely to settle or remain in an island location.

The same effect has been seen within Shetland on islands with bridges, namely Burra, Trondra and Muckle Roe. This is particularly apparent in Trondra where the population has risen from 17 in 1971, prior to construction of the bridge, to 135 at the 2011 census.

Overall, the population of the Faroes is rising. Despite a deep financial recession in the early 1990’s, which closed around half of the fish processing plants on the islands with unemployment rising to 19%, leading to mass emigration, the current population stands at just over 54,000 and is 15.5% higher than in 1988, prior to the economic crash.

	1988	1993	1998	2003	2008	2013	2018	2023
Population	46,898	46,687	44,241	47,605	48,301	48,035	50,494	54,146
5 yearly change		-211	-2,446	3,364	696	-266	2,459	3,652
% 5 yearly change		-0.4%	-5.2%	7.6%	1.5%	-0.6%	5.1%	7.2%
Change from 1988		-211	-2,657	707	1,403	1,137	3,596	7,248
% Change from 1988		-0.4%	-5.7%	1.5%	3.0%	2.4%	7.7%	15.5%

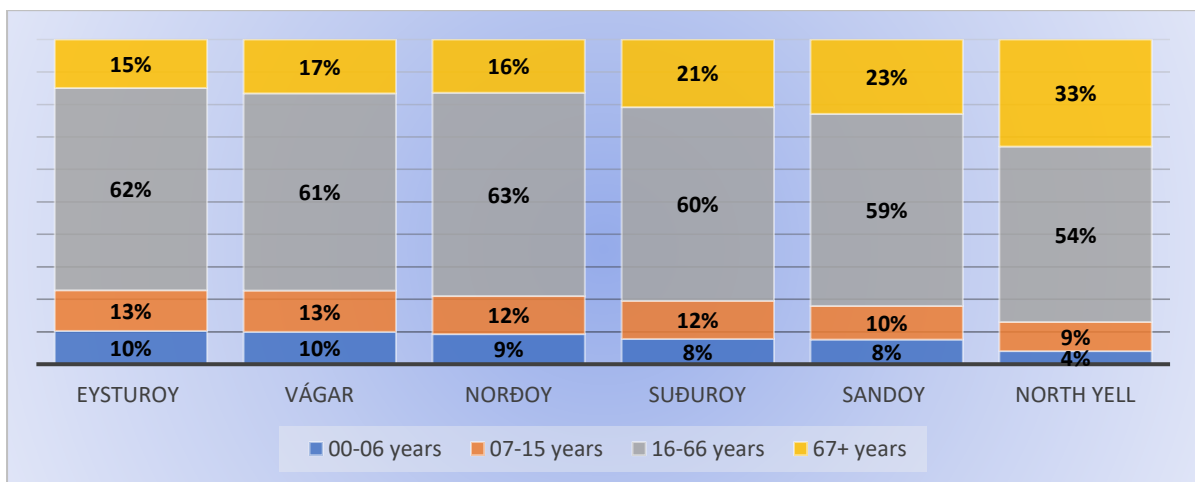
Source Statistics Faroe Islands



The chart above shows population change within island regions of the Faroes over the same period. This shows increasing population in the Eysturoy, Vagar and Nordoy regions, which are areas that are now connected to the main island by subsea tunnels and bridges. In contrast, it shows falling populations in Sandoy where a tunnel will open in December and Suduroy where a tunnel is in the early planning stages. This would tend to suggest a positive population impact on areas with subsea tunnels and/or fixed link connections.

In comparison, during this period the populations of both Unst and Yell have fallen by -45% and -19% respectively. The Unst figure includes the impact of the RAF withdrawal, however both islands population have halved in the last century, which does not include RAF figures.

The chart below demonstrates that, in addition to population growth, areas with subsea tunnels also have a better proportionate age profile than those yet to benefit from tunnels. All areas of the Faroes have a significantly better age profile than that found in North Yell, where over a third of residents are pensioners and only 4% are aged 6 and under.



Source Statistics Faroe Islands – January 2023; North Yell Development Council – December 2022



Whilst in Klaksvik on Bordoy we met a very nice young man serving fish and chips. When asked about the tunnel he said it had been good for Bordoy as people could now travel more easily both to and from the island to work and socialise. The only negative thing he could think of was not getting the chance to speak to people on the ferry anymore. This may be less of an issue in Unst and Yell following covid and the removal of vending machines in social areas on the ferry.



During our discussions with the community on Sandoy, we were told that 44 house sites were being made available for development once the subsea tunnel to the island is opened. There had been 70 applicants for these sites. Lack of housing for both population growth and retention is an issue for our islands, and we were heartened to see such a high level of housing demand as a result of the tunnel to Sandoy. In addition, they are constructing a large kindergarten.

The social impact of subsea tunnels in the Faroes would therefore appear to be positive in terms of population retention and repopulation, age profile, access to employment, services and leisure activities and housing development. These are all matters which we would like to see addressed within our communities.

4. Economic

The Faroese economy, in common with Shetland, has traditionally and continues to be highly fisheries and aquaculture dependent. Fish makes up 90 - 95% of the export value of goods. The islands have experienced strong economic growth in recent years with the economy expanding by around 5% per year since 2010, but remains vulnerable to changes in the seafood sector. Diversification into other sectors including energy and renewables, communications, engineering and tourism is being undertaken.

The 2017 Shetland Economic Accounts state that the two largest export industries in Shetland are aquaculture and fishing, which between them account for nearly 40% of total exports. This includes pelagic, whitefish and shellfish landings, and salmon and mussel aquaculture.

The 2015 Shetland Seafood Sector Community Impact Assessment found that whilst a fifth of all employment and a third of all male jobs in Shetland were seafood dependent, this rose to a third of all employment and a half of all male jobs in the North Isles. Showing a proportionately higher dependence on the seafood industry in Yell and Unst.

Finfish and shellfish aquaculture is a significant employer within, and exporter from, the islands. Salmon aquaculture and processing directly employs around 110 people in Unst and Yell. This includes a hatchery in Unst and site production around both islands, as well as a factory in Yell that processes all fish produced in Unst and Yell, and salmon from other sites in Shetland. Although on a much smaller scale, a 20% increase in production and 40% increase in employment has recently been announced by the local mussel aquaculture sector.

In addition, Cullivoe harbour is Shetland's 3rd largest fishing port, currently ranked 9th in Scotland and 11th in the UK. Annual whitefish landings total over 2,800 tonnes, worth over £6 million, with wild shellfish landings of around 200 tonnes, worth approximately £0.5m. In addition, 30,000 tonnes of farmed salmon worth £130 million are landed, and around 500 tonnes of farmed shellfish worth over £0.5m, are processed at the harbour as shown below.

Ranking	Whitefish	Wild Shellfish	Farmed Salmon	Farmed Shellfish
Shetland 3	Landings 2,852 t	Landings 190 t	Landings 30,000 t	Processed 500 t
Scotland 9	Value £6.1m	Value £460,000	Value £130m	Value £546,000
UK 11				

This highlights the importance of, and dependence on, time sensitive, perishable seafood produce to the Unst and Yell economies. Currently all traffic to and from the islands is restricted due to ferry timetabling and service suspension, which hinders the movement of goods and is a significant burden for businesses in terms of additional cost and time.

The same is true for all other sectors and businesses either operating within and/or trading with Unst and Yell, including construction, agriculture, retail and wholesale, public administration and education, health and social care, service provision, tourism and accommodation, and haulage.

Travel restrictions both limit economic activities and workforce mobility, making recruitment and retention of workers a serious issue for all businesses operating in the islands. The SIC ferry service recently announced that a quarter of their ferry posts are vacant. As well as causing additional issues in relation to inter-island transport, this is an issue which is mirrored throughout economic sectors and businesses in Unst and Yell, with some business owners describing the local labour market as never having been so bad.

It is vitally important to Unst and Yell that current economic activity levels are maintained and grow, particularly in relation to the seafood sector, which is, proportionately, extremely important. It is also important to support existing businesses and lifeline community services and grow emerging sectors such as tourism, space, and renewables.

Supporting, diversifying, and broadening our economic base is therefore imperative for the survival and growth of our communities. We wish to be both an attractive area in which to invest and be ready to do business should any further development opportunities arise. Put simply, we wish to ensure the islands of Unst and Yell continue to be an amazing place to live, work, visit, and invest, and we believe that a major way of achieving this is through permanent fixed transport links i.e. tunnels.

We would also like to address some perceptions being voiced locally that tunnels will empty our islands of people and services, particularly shops and schools. There is no crystal ball to predict the future. However, based on the evidence we found in the Faroes, tunnels appear to have led to population growth and a rebalancing of the age structure. This should help to increase demand for services and therefore assist with their retention.

We have already seen shops in our islands close in recent years without tunnels being in place. Most recently in Ulsta. Those that remain have adapted to changing circumstances within the market, such as residents shopping in Lerwick supermarkets. Ask yourself when you were last in Tesco or the Co-op and didn't see someone from Unst or Yell? We believe that through increasing both the local population and visitors, tunnels may actually improve the sustainability of those that remain. Schools have also closed in our islands in recent years without tunnels being in place. Unst now has only one school, whilst Yell retains three. We believe that through increasing the number of pupils attending these schools, tunnels may actually help retain these services.

Below are a couple of examples of residents we met in the North Isles of the Faroes.



We met a young woman who ran the local shop with her grandmother. She told us the tunnel had been good for their business as there were now more people and visitors in the island, and they supplied goods to other islands in the area that had no tunnel.



In the island of Vidoy we met a man who was working on a project to extend the local school, adding a kindergarten, day centre for the elderly, and community gym. They currently have a single track tunnel through the mountain which has maintained their population. A double track tunnel is currently being built. He said people were starting to request house sites, and development at the school (which has been spoken about for 30 years) was now going ahead. He believes there are too few tunnels in the Faroes.

5. Environmental

Reducing our impact on the environment and protecting our planet are priorities for all of us from Government to an individual level.

In 2019 the UK became the first major economy to pass a law requiring net zero greenhouse gas emissions by 2050. Scotland has declared a climate emergency and through its 2019 Climate Change Act is seeking net zero greenhouse gas emissions by 2045.

Yell is a participant in the Carbon Neutral Islands (CNI) project, which aims to support six Scottish island communities toward achieving net zero by 2040, with the aim to act as Lighthouse Communities in Scotland's decarbonisation journey.

Reducing emissions relating to transport connections forms a major part of our net zero journey, and the table below shows average fuel consumption for vessels operating on Bluemull and Yell Sound ferry routes between 2015 and 2019.

Vessel	Fuel type	Average consumption 2015-19 (litres)
Daggri	Marine Gas Oil	868,058
Dagalien	Marine Gas Oil	933,075
Bigga	Marine Gas Oil	387,833
Geira	Marine Gas Oil	170,295
	Total	2,359,260

Source CNI Energy and Transport Carbon Audit Yell

It should be noted that a proportion of the fuel usage for the Bigga and Geira will relate to ferry services to Fetlar. However, this is a significant source of greenhouse gas emissions for the islands.

Although future ferries may become more fuel efficient and a subsea tunnel is likely to result in increased vehicle traffic, over time this traffic is very likely to become more electrified. We therefore believe that, on balance, a tunnel will be the most environmentally sensitive transport solution for our islands.

A recent report relating to the potential construction of a tunnel to Suduroy in Faroes concluded that the current ferry has relatively high CO2 emissions accounting for 2.6% of the total fuel usage and 1.6% of total emissions in the Faroes. Whilst a subsea tunnel has a high CO2 cost during construction, it has much lower emissions in operation. Analysis over a usage period of 50 years, showed a tunnel solution had lower net emissions amounting to 21.2% of annual CO2 emissions in the Faroes, confirming that a subsea tunnel is significantly more environmentally sustainable than ferries. We would anticipate a similar conclusion if this analysis was conducted for tunnels on both Bluemull Sound and Yell Sound.

6. Funding

Publicly owned tunnel companies operate all subsea tunnels in the Faroes separate from the Government.

All four subsea tunnels in the islands have been funded through public/private partnership. This has included direct public funding which has varied from 59% to 15% of the investment cost as detailed below.

Tunnel	Year	Proportionate Public Investment
Vagar	2003	54%
Bordoy	2006	59%
Etsturoy	2020	15%
Sandoy	2023	20%

When the first two tunnels were built, the Faroese government provided a higher proportion of initial investment but gave no guarantee for the loans. The latter two tunnels have seen a proportionately lower level of public investment, but a guarantee has been provided. This has helped to reduce the loan interest rate. The level of public investment in the latter two tunnels has been based on the level of public subsidy being provided to the ferry service.

Four potential credit funding solutions have been considered for a proposed 5th subsea tunnel in the Faroes.

1. The tunnel is financed as a public investment
2. The government takes out the loan and relends it to the tunnel company
3. The tunnel company takes out the loan with security from the government
4. The tunnel company takes out the loan without government security.

Options 1 and 4 were deemed unlikely. The least expensive solution, and the one recommended, was option 2, as the tunnel company could then borrow money on the same conditions as the Government.

It would therefore appear that the preferred option for funding tunnel infrastructure in the Faroes continues to be a proportion of public investment, supplemented by publicly sourced/guaranteed loan finance. We believe that this is an option that could also work for tunnels to Unst and Yell.

Tolls are charged on all subsea tunnels in the Faroes. These are paid one way for a return trip, as is currently the case for ferries in Shetland, for the Vagar and Bordoy tunnels, and singularly for the Eysturoy tunnel. These charges are used to both pay for the operation of the tunnels and repay loans. Loans for the tunnels to Vagar and Bordoy are fully repaid, and repayment was made several years ahead of predictions. This was in part due to higher traffic volumes than that estimated prior to opening.

Current toll charges are detailed below. Subscription payments are available, which reduce travel costs. These are aimed at island residents and commuters and are not available for hire cars.

Prices stated for a return trip in Vágatunnil and Norðoyatunnil:

You are only charged when driving from Vágur in Vágatunnil and driving from Klaksvík in Norðoyatunnil.

 Vehicles total weight of max 3,500 kg	 Vehicles more than 3,500 kg	 Motorcycles
DKK 100	DKK 300	Free

Other prices with subscription, see www.tunnil.fo

Prices stated for one trip in Eysturoyartunnil:

 Vehicles total weight of max 3,500 kg	 Busses over 3,500 kg Other prices, see tunnill.fo	 Motorcycles
STREYMOY - EYSTUROY		
DKK 175	DKK 800	DKK 160
STRENDUR - RUNAVÍK		
DKK 125	DKK 200	DKK 120

Other prices with subscription, see www.tunnill.fo

A return trip is around £11 for cars and £35 for larger vehicles to Vagar and Bordoy. Costs are £14 - £20 for cars and £23 - £93 for larger vehicles for single trips to Eysturoy. Subscriptions for cars work through prepayment. This reduces a return trip to Vagar and Bordoy to £2.33. In addition, a car with a subscription is only charged for a maximum of 15 journeys per month, capping travel charges at £35/month. For Eysturoy there is a reducing charge based on the number of trips taken in a month, with a max payment of £244/month.

Current fares for return ferry travel to Unst and Yell are.

Vehicle Fares (include the driver)	Cost
Vehicles up to and including 5.50m	£16.50
Motorcycles Return	£13.00
Motorhome depending on length	£23.50 - £32.00
Truck depending on length	£33.95 - £90.95
Trailer depending on length	£8.00 - £15.50
Vehicle (<5.5m) 10 Journey Ticket	£106.00
Motorcycle 10 Journey Ticket	£85.00

10 journey tickets can reduce car and driver fares to £10.60 and motorcycles to £8.50. Additional passengers in vehicles are charged at £2.80 per adult and 80p for over 60's and under 19's – please note unfortunately Young Scot cards do not entitle our young people to free travel on inter-island ferries. There is currently no monthly usage cap.

Therefore, tunnel tolls in the Faroes are not that dissimilar to ferry fares in Shetland. However, it should be noted that ferry fares only pay for 10% of the actual running costs of the Shetland ferry service, with the deficit currently being paid by the Scottish Government. It should also be noted that this is a threat to our current ferry service as deficit funding is only provided on an annual basis, and there is no guarantee that this will continue indefinitely.

Funding of subsea tunnels through public/private partnership, utilising both public investment and publicly sourced/guaranteed loans, financed by toll payments is certainly working in the Faroes. We have never suggested that tunnels to Unst and Yell should either be fully publicly funded nor toll free. We would like all potential funding routes that could make tunnels to our islands a reality to be explored, and we believe that the Faroese model is certainly one that should be examined in more detail.

7. Summary and Conclusions

There is nothing new about underwater tunnels. The first were built in the 19th century, with the UK leading the way. However, in recent times we appear to have fallen behind others in terms of tunnel building ambition and expertise, and perhaps it is time that this was addressed. Tunnels between Unst, Yell and Mainland Shetland would provide a very good starting point for developing the methodology, skills, and experience with which to cultivate this form of engineering within our nation. In addition, we feel the introduction of tunnels will provide opportunities for growth and development for our communities and the national economy, as well as assist in our journey towards carbon neutrality, and help rebalance the incessant centralisation of both services and population.

Faroes

The first tunnel in the Faroes opened 60 years ago, with around 11% of the entire Faroese road network now underground. As of December this year, the Faroes will have 22 tunnels four of which are subsea. Details of the opening dates and length of the four subsea tunnels in the Faroes are set out in the table below.

Subsea Tunnel	Year Completed	Distance (km)
Streymoy to Vagar	2003	4.9
Eysturoy to Bordoy	2006	6.2
Streymoy to Eysturoy	2020	11.4
Streymoy to Sandoy	2023	10.8

For comparison the current estimated length of tunnels between Unst, Yell and the Shetland Mainland are...

- Bluemull Sound (Unst to Yell) 2.0 – 2.5 km
- Yell Sound (Yell to Mainland) 4.5 – 5.0 km

Geology

The overwhelming message we received in the Faroes was that if you are serious about any tunnelling project, the first thing you need to do is map the geology. This was very good to hear, as geological investigations form the cornerstone of the work we intend to undertake. Whilst the geology of the Faroes differs from that of Shetland, the underlying principles of the work to be undertaken, and data to be collected, remains the same.

The process of geological investigation detailed by the Faroe Islands Geological survey is geological mapping; seismic surveys; seabed mapping/multibeam; drone photos and geotechnical cores and logging. It is believed that previous work may have been undertaken by Shetland Islands Council; oil, renewables and fisheries industries and service providers, including those laying subsea cables, which could assist with these geological investigations. Our target during the initial phase of our fundraising is to undertake geological investigations up to geotechnical cores. We will then move forward to seek funding for core sampling to provide the necessary data for developers to take the tunnels forward.

Social

When the Sandoy subsea tunnel opens in December, 88% of the Faroese population will be linked through the same road network. Whilst sceptics worried that the tunnels would suck the lifeblood out of island communities, the opposite appears to be occurring.

Overall, the population of the Faroes is rising, as is the population in areas that are now connected to the main island by subsea tunnels and bridges. The same effect has been seen within Shetland on islands with bridges, namely Burra, Trondra and Muckle Roe. In contrast the population is falling on Faroese islands without tunnels, as has also been the case in Yell and Unst. In addition, islands with subsea tunnels also have a better proportionate age profile than those yet to benefit from tunnels.

On Sandoy 44 house sites are being made available for the opening of the subsea tunnel. There have been 70 applicants for these sites. In addition, they are also constructing a large kindergarten.

The social impact of subsea tunnels in the Faroes would appear positive in terms of population retention and repopulation, age profile, access to employment, services and leisure activities, and housing development. These are all matters which we would like to see addressed within our communities.

Economic

Both the Faroese and Shetland economies have traditionally and continue to be highly dependent on fisheries. Within Shetland there is a higher proportionate dependency on the seafood sector in Unst and Yell, accounting for a third of all employment and a half of all male jobs. Aquaculture is a significant employer within, and exporter from, the islands, and Cullivoe harbour is Shetland's 3rd largest fishing port, currently ranked 9th in Scotland and 11th in the UK. This highlights the importance of, and dependence on, time sensitive, perishable seafood produce to the Unst and Yell economies. Currently all traffic to and from the islands is restricted due to ferry timetabling and service suspension. This hinders movement of goods and is a significant burden for businesses and service providers in terms of additional cost and time, limiting both economic activity and workforce mobility.

Supporting, diversifying, and broadening of our economic base is imperative for the survival and growth of our communities. We wish to be both an attractive area in which to invest and be ready to do business should any further development opportunities arise e.g. space, renewables and tourism. Put simply, we wish to ensure the islands of Unst and Yell continue to be an amazing place to live, work, visit and invest, and we believe that a major way of achieving this is through permanent fixed transport links i.e. tunnels.

Environmental

Reducing our impact on the environment and protecting our planet are priorities for all of us from Government to an individual level. A recent report relating to the potential construction of a further subsea tunnel in the Faroes concluded that this was significantly more environmentally sustainable than ferries. We would anticipate a similar conclusion if this analysis was conducted for tunnels on both Bluemull Sound and Yell Sound.

Funding

Publicly owned tunnel companies operate all four subsea tunnels in the Faroes separate from the Government. All subsea tunnels have been funded through public/private partnership. This has included direct public funding varying from 59% to 15% of investment cost. Public investment in the latter two tunnels was based on the level of public subsidy being provided to the ferry service, with loans guaranteed by the Faroese Government.

Tolls are charged on all subsea tunnels in the Faroes. These charges are used to pay for the operation of the tunnels and repay loans. Loans for the tunnels to Vagar and Bordoy are fully repaid, with repayment made several years ahead of predictions. This was, in part, due to higher traffic volumes than that estimated prior to opening.

Tunnel tolls in the Faroes are not that dissimilar to ferry fares in Shetland. However, it should be noted that ferry fares only pay for 10% of the actual running costs of the ferry service, with the deficit currently being paid by the Scottish Government. It should also be noted that this is a threat to our current ferry service as deficit funding is only provided on an annual basis, and there is no guarantee that this will continue indefinitely.

Funding of subsea tunnels through public/private partnership, utilising both public investment and publicly sourced/guaranteed loans, financed by toll payments is certainly working in the Faroes. We have never suggested that tunnels to Unst and Yell should either be fully publicly funded nor toll free. We would like all potential funding routes that could make tunnels to our islands a reality explored, and we believe that the Faroese model is certainly one that should be examined in more detail.

Are we crazy?

Constructing tunnels between Unst, Yell and Mainland Shetland is certainly well within the technical capabilities of those regularly undertaking this type of project. The evidence from other areas would suggest that tunnels would be both socially and economically beneficial, and the most environmentally sustainable option for our islands. In addition, mechanisms for funding subsea tunnels have worked well in other areas.

The issue really comes down to a fear of the unknown from those in authority who are not familiar with this type of project, and/or the political will to explore or back a project with longer term outcomes, when faced with short term priorities.

Ultimately it comes down to risk. The costs for tunnels currently being quoted within political circles in the UK are far beyond those quoted to us by Faroese and Norwegian tunnelling experts: they are not even in the same ballpark. A major factor in this is the level of risk costing currently being added to tunnel projects in the UK. A lot of this risk and uncertainty can be reduced/mitigated through geological investigation. As was the overwhelming message we received in the Faroes “if you are serious about any tunnelling project, the first thing you need to do is map the geology.”

[*That is why we are centring our efforts on geological studies in order to get a better understanding and more realistic costing for tunnels to serve our islands.*](#)

There is no guarantee that the Scottish Government will continue to fund the deficit for our ferry service, nor any plan, realistic costing, or budget in place for ferry replacement, and even if these were to magically appear, our communities and our children will still face the same ongoing saga every 20-30 years.

Therefore, we would say we are not crazy, but rather forward thinking.

As stated in the foreword, we hope that this report will help you form your own opinion in relation to tunnels to Unst and Yell. However, we would strongly encourage those in authority who have not already done so, to look at this in more depth and/or take a trip to the Faroes to see for themselves what can and has been achieved.

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