

High Speed Broadband - Business Analysis

Shetland Islands Council

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1. Executive Summary

By the end of this plan (2020), we want to be known as an excellent organisation that works well with our partners to deliver sustainable services for the people of Shetland. – Shetland Corporate Plan

Shetland Islands Council (the Council) has long recognised that the development of digital services represents a significant part of its obligations to develop social, business and economic growth of the islands. Going back as far as 2005, the Council met with leading global providers of telecommunications solutions to ensure Shetland had the appropriate level of bandwidth and connectivity to support it's needs.

Over the past 10 years the islands digital infrastructure has developed significantly, primarily through the Shetland Islands Council's Telecoms initiative (Shetland Telecom) and initiatives from BT to expand its own high-speed broadband capability through the BDUK¹ project funding.

The Council has recognised that now is the right time to take a fresh look at the demand for high speed broadband connectivity across all the key stakeholder groups and determine the optimal way to meet these demands over future years, financially, technologically and operationally.

To support the above evaluation, the Council is preparing a business case to inform its future strategy for the provision of telecom services in Shetland, and this report presents a review of the Strategic Case.

This report principally covers:

- the key digital demands both short and long term across Shetland;
- strategic opportunities that might be enabled through enhanced digital connectivity;
- how the key suppliers are facing up to the demand challenge;
- a high level GAP analysis and potential implications of the Council leaving the "market" to meet the demand unaided.

¹ BDUK = Broadband Delivery UK, part of the UK Government Department of Media, Culture and Sport

1.1 Digital Revolution

The summary of this report is that like any other community across the globe, the Shetland Islands has the opportunity to be transformed through the digital economy. The benefits include new applications for health, social care, additional businesses, social inclusion and education, in particular. These represent significant opportunities for communities on Shetland to benefit from the digital economy.

There is also evidence to suggest that the incremental benefits may be greater than in other UK areas due to the inclusion opportunities offered by digital to remote communities. These include tangible benefits such as:

- Reduced cost of travel through access to online services including, for example, tele-health applications;
- Creation of economic wealth through home-worker communities and reduced outward migration.

Additionally, many intangible benefits exist such as the social maintenance of communities, particularly where elderly people become reliant on remote family members, and the creation of local digital communities.

1.2 Ability to realise the benefits

These opportunities can only be realised through effective fixed and mobile infrastructure (increasingly these go hand in hand) and it's clear that should the Council wait for the the "market" to deliver increased fixed capacity as well as 3G, 4G and even 5G services, the pace at which the digital opportunities and benefits can be realised will be dependent on the speed at which the incumbent commercial suppliers (currently mainly BT and Vodafone) invest in infrastructure. Consequently, some form of market intervention is required to bring these benefits and opportunities forward.

A full analysis of the options for intervention should be explored further including;

- Joint working between the major (fixed and mobile) communications providers, Council and Community groups;
- A review of funding available from Europe, Community Broadband Scotland, HIE to help fund increases in infrastructure;
- The Council continuing to develop the Shetland Telecom infrastructure (dark fibre) to facilitate high speed services into key locations (schools, community centres, health & care) and making these available to communities.

Additionally, it is critically important that the development of broadband isn't seen as a one-off project to connect the islands. It is clear that the demand for increasing bandwidth is likely to continue, new technologies such as cloud/ SaaS (software as a service) and the "internet of things", will drive ever increasing bandwidth needs.

As more that one contributor to this report stated:

"its not about fixing it and walking away, its about a long term plan"

Consequently, the Council needs a long term strategy that enables bandwidth to be added and increased in the islands over time at the lowest incremental cost.

A strategy that is wholly reliant on 3rd party investment in infrastructure through the major service providers, is likely to result in the Council having to invest further significant tranches of capital to meet future bandwidth demands.

1.3 Summary

The summary of the strategic case for the Council in respect of intervention in digital connectivity considers the following:

- A widening gap in broadband capability between Shetland and the best connected areas of Scotland/UK is likely to occur unless there is further intervention/investment in the local market;
- High speed mobile connectivity is becoming increasingly essential to modern living and there is no evidence to suggest that the mobile operators will invest in upgrading the infrastructure in Shetland in the near future;
- Shetland Telecom has an active role to play in the development of broadband services across the Islands, however, the model for delivery and service provision needs to be reviewed in detail;
- It is difficult to see how the "world class 2020" ambition can be achieved without Council intervention;
- In remote locations, the demands and discrepancies will become ever more apparent with a need for some form of support to enable equivalent and sustainable services to be delivered.

As a consequence of the above, we would conclude that there is a strategic case for the Council to develop a business case for intervention into digital connectivity.

2. Introduction

2.1 Background

Shetland Islands Council (the Council) commissioned FarrPoint to engage with the Council's partners and stakeholders to discuss their needs and the benefits that high speed broadband and other options for digital connectivity, may bring.

This report will form the Strategic Case for a Building Better Business Case process that the Council is completing to inform its future strategy for the provision of telecom services in Shetland.

The Council currently owns a network, consisting of fibre and microwave links which it uses to provide connectivity to around 150 sites (schools, offices, care centres, ferry terminals etc.) around Shetland, services to partners in the third sector, and community organisations. The Shetland Telecom Project has established a backhaul network over this fibre which is used to provide wholesale services to a number of retail service providers.

The Digital Scotland Superfast Broadband project (DSSB) is currently being implemented by BT and will introduce high speed broadband to certain areas of Shetland, although the final extent of the improved service is not yet clear.

There is therefore a developing position with regards to the supply of telecom services across Shetland, and the Council needs to understand what further demands and opportunities exist, where the gaps with supply may occur, and how best these are addressed. The first step, which is addressed within this report, is to understand the demand and strategic case for some form of Council activity.

2.2 Methodology

Following project initiation and initial background research, a range of stakeholder meetings were held in Shetland with those interested in the development of broadband across Shetland, to understand the demand for improved connectivity and the differences it would make to commercial, public and social activities. Open sessions were also included for members of the public to share their views and an online facility was provided for additional feedback. Further telephone interviews were held with a number of contacts to add to these views.

The feedback from these sessions was used to help understand the level of demand and the potential gaps that were forming against the supply position.

In addition to these demand focused meetings, further discussion was held with supply related organisations including BT, SWAN, Vodafone and Highlands & Islands Enterprise.

2.3 Report Format

The report is structured around the headings of the Strategic Case as defined in the Government Green Book Business Case model.

The Strategic Case demonstrates that a project provides business synergy and strategic fit. This includes the rationale of why intervention is required, as well as a clear definition of outcomes and the potential scope for what is to be achieved.

Development of the strategic case requires the Council to demonstrate how the project fits in relation to national, regional and local policies, strategies and plans and furthers the required outcomes.

It also requires the Council to demonstrate that the project has clear and concise spending objectives, which are Specific, Measurable, Achievable, Relevant and Time constrained (SMART).

The case for change must be based on a rigorous assessment of the issues (business needs) associated with the status quo (existing arrangements) and the potential scope of the proposed spend in relation to the anticipated benefits and potential risks.

The report is structured as follows:

- Strategic Context
 - Organisational Overview – snapshot of the Council: purpose, structure and environment
 - Business Strategy and Aims – existing and future plans including any relevant national initiatives and stakeholders/customers for services
- Strategic Needs
 - Spending Objectives – key objectives for proposed spending
 - Existing arrangements – snapshot of current service arrangements
 - Business needs, current and future – service gaps to be filled

- Potential scope and service requirements
- Benefits criteria – main benefits by stakeholder group
- Strategic Risks – key business, service and external risks, outline mitigation and management
- Constraints and dependencies – internal and external.

The outcome of this report should be a clear understanding of the strategic context for the spending proposal in terms of how it provides holistic fit and delivers synergy with other components within the programme blue print and implementation strategy.

3. Strategic Context

3.1 Organisational Overview

Shetland Island Council (the Council) is the local authority for Shetland, established by the Local Government (Scotland) Act 1973. The Council provides services in Environmental Health, Roads, Social Work, Community Development, Organisational Development, Economic Development, Building Standards, Trading Standards, Housing, Waste, Education, Burial Grounds, Port and Harbours and other areas.

The Council serves 22,400 people across 1,468 square km and has 22 elected members serving until 2017.

The population's age profile in 2011 shows the number of people aged over 64 has increased by over 20% since 2001 indicating that there will be an increasing proportion of older people in the future.

The overall population has also increased since 2001, likely influenced by Shetland's strong economic performance in that time. According to the Community Plan, between 2003 and 2011 Shetland's economic output has grown by 3.5% annually on average, from around £860M per year to over £1BN. This growth can be traced to expansion in both the private and public sectors, with fisheries and aquaculture identified as key growth areas in the private sector.

Shetland's employment by sector shows a high level of employment in the public sector. Achieving a more balanced economy by sustaining growth in the private sector and promoting economic resilience and diversity are key priorities for Community Planning in Shetland. This is reflected in local economic priorities such as renewable energy and broadband development, which seek to promote control of local resources.

The Council has recently modernised its constitutional arrangements which includes the support for rigorous options appraisal and review of different courses of action and to enable decisions to be taken efficiently and effectively. Under the Council's policy framework there are a number of plans, policies and strategies all working to an agreed budget.

The Council has faced financial challenges and has strived to bring spending under control. The Council reserves, which are invested to generate a return to spend on services, have been strained and recent budget setting is focused on reducing the

amount taken from these reserves. The Council's priorities of children's services and community care have been protected with savings made across the departments of Corporate and Executive, Infrastructure Services and Developments Services.

The Council operates under five directorates:

- Children's Services;
- Community Care;
- Corporate and Executive;
- Infrastructure Services;
- Development Services.

3.1.1 Children's Services

The Council currently meets the education requirements through providing school education at two high schools, six junior high schools and twenty four primary schools. In addition, pre-school education is provided in nineteen of these establishments.

The Council's statement for education is:

"We will ensure the best quality education for all our pupils to enable them to become successful learners who are confident individuals, effective contributors and responsible citizens. We will achieve this through the highest standard of teaching and learning delivered in modern well equipped school buildings which are financially sustainable."

As part of the Shetland Partnership Outcomes, the Council seeks to make:

"Shetland the best place for children and young people to grow up."

3.1.2 Community Care

The Council supports people who have needs or risks that affect their health, well being or restrict their participation in community life. This may be due to a disability, illness or other factor.

The Council's ambition and aim is to find flexible solutions to individual need and to support people to find sustainable and safe ways to maintain their health, well being and community participation.

3.1.3 Infrastructure Services

The Council provides extensive support to the network of ferries, ports and roads including the major installation at Sullom Voe. Transport is a major issue within the islands and is key to sustaining some of the more remote areas. One of the Council's stated top priorities in the recent Corporate Plan is to:

“Deliver quality transport services within Shetland, as well as secured improvements in services to and from Shetland.”

3.1.4 Development Services

Development Services includes community planning, housing and economic development.

The Council aims to improve economic opportunities in Shetland through a range of measures to support people and businesses to develop their ideas into commercial reality.

Local industrial sectors continue to perform strongly, most notably the combined fisheries sectors (aquaculture, processing and catching), which contribute around one-third of Shetland's total economic output; also developments in oil and gas, renewable energy and decommissioning will offer important opportunities.

The Council's Economic Development Policy Statement (2013 – 2017) states:

The integration of next-generation broadband will bring economic and social benefits, as well as a demonstration of innovative methods of infrastructure delivery and the implementation/development of new technology.

Within the plan there is an action to provide high speed digital broadband in Shetland with the outcome/targets of:

- 85% of households able to access superfast broadband (20Mbps);

- develop technical and service needs cases for extensions of the Council broadband network for Unst and Fetlar;
- Achieve net income of £140,000 in sales;
- Promotional campaign developed and implemented.

3.1.5 Shetland Telecom

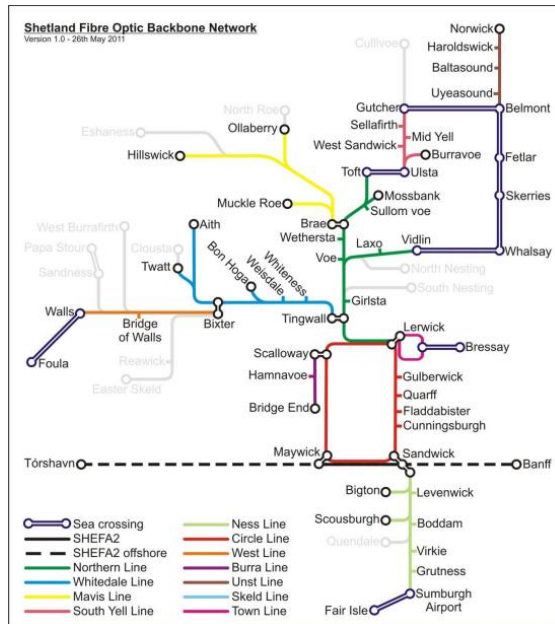
The Council's Economic Development department developed the Shetland Telecom project as a response to identified market failure in the provision of reliable broadband in the Shetland Islands. Improved broadband was an identified priority in successive Council strategies/plans. The opportunity afforded by the Faroe Islands' investment in SHEFA2, coupled with a lack of private sector interest in taking advantage of this infrastructure, created the particular circumstances that led to the Council investing in the Shetland Telecom project.

The project has delivered four phases of infrastructure: Lerwick to Sandwick; Lerwick to Scalloway; Scalloway to Maywick; and Brig of Fitch to Sellaness. A fifth phase planned to take in Vidlin, Tingwall, Nesting and Mossbank has connected Vidlin and Tingwall before further funding was halted.

A direct fibre connection has been provided from Lerwick to the Internet in London, and the main population and business centres, Lerwick, Scalloway, Sandwick, Cunningsburgh, Brae, Voe, Vidlin, Tingwall and Sellaness all have access to resilient, reliable, high speed networking.

The Shetland Telecom fibre is being used by oil companies, including BP, Total and Petrofac, via re-sales arising from wholesale sales to Shetland Broadband and Faroese Telecom.

The network plan is shown in its projected form in Figure 3.1.



3.1.6 Financial

In 2010, the Accounts Commission raised serious concerns regarding the leadership, governance and accountability of Shetland Islands Council, which had given rise to the unsustainable financial position of the Council.

“The Council faces a challenging financial future. It has agreed budget savings for 2010/11 but has yet to demonstrate how it can sustain its current level of services in future years whilst maintaining its target reserves balance and delivering its capital plans. This will require difficult decisions to be taken and clear and consistent leadership by elected members.”

Following this report, the Council embarked on an Improvement Plan to address the Commission’s recommendations and the Accounts Commission’s follow up review in 2012 concluded that:

“The Council is moving in the right direction and there is a clear commitment to improve. The Council’s self awareness has improved and it understands that it must focus on its priorities and what it needs to improve for the future.”

As part of the recommended improvements, the Medium Term Financial Plan was approved to set out the roadmap for the Council to achieve financial sustainability over the term of this Council and to align resources in accordance with the priorities of Councillors.

3.1.7 Summary

The organisational review of the Council and its purpose, highlights the focus the Council has on developing and caring for people, strengthening communities, developing the economy, and improving connections and access. Digital Connectivity is a running theme that underpins the delivery of Council services and will become ever more essential. There is, therefore, clearly a strategic context for the Council to consider further. This focus is expanded further in the Council’s Business Strategy and Aims.

3.2 Business Strategy and Aims

The Council has long recognised that in a digital age, access to high-speed broadband and mobile connections are expected rather than desired. The Council understand that lack of access to these connections is a major constraint to business and leisure in more remote areas and could represent a disincentive for people to move there. The Council are committed to removing that disincentive and this is reflected in the business strategies and aims set out in relevant strategy plans.

3.2.1 Corporate Plan

Within the newly revised Corporate Plan, the Council recognises three key challenges to be addressed:

Resources The Council recognises there are reducing resources available within the public sector and at the same time rising costs. There is therefore a requirement to ensure that the resources available are spent in the most effective way possible.

Economy There is recognition that planning must be done to prepare for economic issues that will arise in the medium term future. Businesses and people across Shetland identify high-speed broadband and affordable housing as important constraints in terms of being able to sustain and grow the economy in future years and the plan seeks to drive positive action on those areas.

Demographics Higher demand from an older population will increase the cost of providing care. Efforts will be made to encourage healthy and active lifestyles that will reduce the need for care in old age.

The Council's overall vision within the Corporate Plan is that:

“By the end of this plan (2020), we want to be known as an excellent organisation that works well with our partners to deliver sustainable services for the people of Shetland”

By the end of the plan in 2020, one of the Council's stated priorities is for:

“Improved high-speed broadband and mobile availability across Shetland.”

The Plan translates the vision and priorities into five key areas:

- young people;
- older people;
- economy and housing;
- community strength and resilience; and
- connections and access.

Within connections and access, the Council acknowledge that:

“in a digital age, access to high-speed broadband and mobile connections are increasingly expected rather than desired. And rightly so. Lack of these connections is a major constraint to business and leisure in more remote areas and could represent a disincentive for people to move there. We want to remove that disincentive.”

The other four key areas are also influenced by improved connections and access:

Younger people The Community Plan aim is to make Shetland the best place for children and young people to grow up in. Young people will be equipped with the skills to enable them to get jobs or continue into further education.

- Comment: Access to IT is now seen as a prerequisite in education and business with a strong focus on online delivery across fixed and mobile platforms. Young people are the highest adopters of technology.

Older people Increased use of technology will be helping to provide care for the most vulnerable and elderly in the community.

- Comment: IT as an enabler for improved health care has a significant focus with developments around telehealth in particular just starting to form nationally, and with huge potential.

Economy and Housing Shetland will have a wider business base and will have formed a closer partnership with businesses in both traditional and emerging sectors. There will be more highly skilled and well paid jobs in a wider range of business areas than there are at the moment. Shetland's work force will be suitably skilled and qualified to take up those jobs.

- Comment: Access to IT services and modern mobile and fixed communications is essential for developing a wider business base.

Community Strength and Resilience Sustainable communities, with people able to access the amenities and services they need.

- Comment: Access to online services provides huge benefits to rural areas and allows communities to break down barriers of distance and remoteness.

3.2.2 Community Plan

Community Planning in Shetland aims to make Shetland the best place to live and work by helping to create communities that are:

- Wealthier and Fairer;
- Learning and Supportive;
- Healthy and Caring;
- Safe;
- Vibrant and Sustainable.

The Community Plan sets out to achieve this with certain key outcomes:

- *Ensuring that Next Generation Broadband is available to 75% of Shetland's population by 2016 – helping to boost social connectivity and economic activity throughout Shetland and helping economic development and service delivery in some of Shetland's remoter areas.*
- *Developing a 5-year plan aimed at attracting people to Shetland to live, work, study and invest – increasing further our already high level of economic activity and participation.*
- *Implementing at least one bold and innovative project to help the most vulnerable families in Shetland improve their life chances – helping to reduce inequalities in our society.*

3.2.3 Education Plan

The Strategy for Education Services in Shetland, published in November 2013, reviews the options to provide savings across the service whilst maintaining standards and meeting the Council's statement for education.

The cost per pupil in Shetland is approximately 1/3 higher than the nearest comparable in Orkney and Western Isles with no significant difference in attainment levels. Shetland differs from other Councils in terms of the Junior High School system, which has continued in Shetland and which contributes to the high cost per pupil.

The Strategy includes a recommendation to develop the concept of a Shetland Learning Campus for all school age students and adult learners throughout Shetland. This would require the entire education system in Shetland to be seen as an 'interconnected' learning environment, designed to meet the needs of learners of all ages. This includes the on-line access to all curricular learning materials and the implementation of an independent learning programme for all students to enable them to access learning opportunities on offer in Shetland and elsewhere.

3.2.4 Our Islands Our Future

Shetland hosted the first annual 'Islands Summit' between the three Islands Councils (Orkney, Shetland, Comhairle nan Eilean Siar) and the UK Government.

Discussions focused on reviewing progress on the key Government policies of interest to the islands such as connection to the national energy grid, measures to address fuel poverty, and improving connectivity with mobile and Internet services.

It is understood that discussions will shortly be held between the Scottish Government and the Our Islands Our Future group on the potential use of ERDF funds to help improve mobile connectivity. It is hoped that plans will be in place by end of 2015 on how potential projects will be delivered.

3.2.5 Digital Shetland 2014/17 Strategy

The Digital Shetland 2014/17 Strategy was accepted by Development Committee and the Council on 16 June 2014 and 2 July 2014 respectively. The strategy identifies a partnership working approach which has been effective but a report to the Development Committee in January 2015 highlights that this now needs to be more active to ensure best outcomes as rollouts progress.

The strategy outlines the progress with the Digital Scotland Superfast Broadband programme between Scottish Government, HIE and BT which has current plans to connect 76% of Shetland premises to a Next Generation Access network infrastructure. Actual speeds achieved will vary with a significant percentage of those premises receiving Next Generation Broadband (NGB) speeds (now defined as download speeds greater than 30Mbps).

The strategy also outlines the progress with the Shetland Telecom project in terms of the extent of the rollout, the utilisation, revenue levels and staff resource, which are under strain.

As a replacement to the previous Pathfinder contract, the Council connect their sites using a variety of technologies but a more robust and higher capacity solution is required for some of these connections in the medium to long term.

These complimentary projects now need to actively work in partnership to secure the maximum overall benefit in terms of improved digital connectivity for economic and social needs.

3.2.6 Best Value

In addition to the need to achieve financial sustainability, all public bodies in Scotland have a statutory duty to provide Best Value. The duty of Best Value, as set out in the Scottish Public Finance Manual, is:

- to make arrangements to secure continuous improvement in performance whilst maintaining an appropriate balance between quality and cost; and, in making those arrangements and securing that balance;

- to have regard to economy, efficiency, effectiveness, the equal opportunities requirements and to contribute to the achievement of sustainable development

The Council recognises it has to prioritise spending on capital projects to ensure funding is being targeted on the things that will help achieve the outcomes in the Corporate plan and the Community Plan.

3.3 Strategic Context Summary

The organisational review of the Council and its purpose, together with the review of the Council's Business Strategy and Aims, clearly shows the importance of Digital Connectivity as an enabler for social and economic development, and ongoing sustainability. There is, therefore, a definite strategic context for the Council to consider further intervention.

4. The Case for Change

4.1 Spending Objectives

A robust case for change requires a thorough understanding of what the Council is seeking to achieve (the spending objectives); what is currently happening (existing arrangements); and the present problems and future service gaps (business needs). Analysing a project in this way helps to provide a compelling case for spending, as opposed to it simply being 'a good thing to do'.

The spending objectives for the project relate to the underlying policies, strategies and business plans of the Council. They should also be made SMART – specific, measurable, achievable, relevant, and time constrained.

Digital connectivity has targets at a European, UK, and Scottish levels which are relevant to Shetland. These are:

Europe	<ul style="list-style-type: none">• Access to 30Mbps to all by 2020• 50% households using 100Mbps by 2020
UK	<ul style="list-style-type: none">• 24Mbps to 90% by 2016• 24Mbps to 95% by 2017
Scotland	<ul style="list-style-type: none">• 24Mbps to 95% by 2017• “World Class” by 2020
HIE	<ul style="list-style-type: none">• 100% access to 30Mbps by 2020

Following review of Council strategies and business plans, and incorporating feedback from Council led input to the workshop sessions, the following spending objectives are outlined and will be finalised as the business case progresses:

	Objective	Why
1	Working with partners, increase the provision of NGB speeds to at least 80% of premises by 2016, and to 95% by 2017;	The 2016 target is based on a Shetland Partnership stated outcome with the suggested amendment to coverage of premises rather than population and an increase in % due to likely developments within the DSSB project. The 2017 target reflects the Scottish target. This increased

		provision also ties in with the Corporate Plan to improve high-speed broadband and mobile availability across Shetland. Note that NGB speeds means greater than 30Mbps download.
2	Provide high speed connectivity to all schools with at least 10Mbps to all primary schools and 100Mbps to all secondary schools by 2017 with fibre as first choice.	This contributes to the requirement to improve connectivity to some schools which do not meet requirements for curricular or admin access. This objective also contributes to the Community Plan vision as Shetland being the best place for children and young people to grow up; that there are strong, resilient and supportive communities; and that services are delivered in an environmentally sustainable manner. The bandwidth figures are typical of other local authority school provisions.
3	Ensure fibre connectivity to Yell and Unst by 2017.	These more northern communities are poorly served and have significant inclusion challenges.
4	Provide public access to next generation broadband in all Council premises by 2016.	This contributes to the Community Plan vision for strong, resilient and supportive communities; and that services are delivered in an environmentally sustainable manner.
5	Work in partnership with NHS Shetland to ensure high-speed broadband is available to all NHS locations across Shetland by 2017.	As a platform for the development of telehealth services, this contributes to the Corporate Plan priority to support older people to access services and help them live independently. It also supports the Community Plan that we live longer, healthier lives and that people are supported into older age.
6	Work in partnership with other public sector organisations to provide high speed mobile coverage to key locations (to be defined) across Shetland by 2017.	This objective ties in with the Corporate Plan to improve high-speed broadband and mobile availability across Shetland.

7	Support the development of ICT supply chain within Shetland through promotion of opportunities, contracts and training.	This objective contributes to the Community Plan for sustainable economic growth with good employment opportunities. It also contributes to the Corporate Plan for a wider business base and a closer partnership in both traditional and emerging sectors, and more highly skilled and well paid jobs in a wider range of business areas.
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4.2 Existing Arrangements

The provision of digital connectivity across Shetland is primarily through BT for fixed infrastructure and through the national mobile operators for mobile connectivity. In addition, Shetland Telecom provide wholesale services over the Council fibre to allow retail operators to serve end-customers.

4.2.1 BT

BT has a portfolio of next generation access technologies that it is commercially rolling out across the UK. To extend coverage further beyond the commercial footprint, the UK and Scottish Governments (through Digital Scotland Superfast Broadband programme) have provided funding to BT, channelled through Highlands & Islands Enterprise for the Shetland area, to increase the number of premises connected to BT's next generation access infrastructure. This is predominantly through Fibre to the Cabinet (FTTC) with a small proportion of premises directly connected by fibre.

Within Shetland, an estimated 76% of premises are currently planned to be connected by the end of 2016 through modelling by BT. BT are looking at extending coverage through optimisation of this modelling process and it is looking increasingly likely that additional premises can be reached. Note that not all of these premises will receive NGB speeds of 30Mbps and above as speed drops with distance from a cabinet.

A further round of public funding (Phase 2) has been released and BT is in the process of modelling the additional coverage it could provide if it were awarded this funding. Results of this modelling are expected shortly and the decision on how the Phase 2 funding will be used is expected by the end of the year. This could extend BT coverage further in Shetland through 2017.

When combined with existing commercial roll-out plans, this programme is expected to deliver access to next generation broadband to around 85% of premises in 2015/16 and at least 95% of premises by the end of 2017 across Scotland.

A further Phase 3 fund is also being developed by the UK government to tackle the final 5% of premises which will not be covered by the earlier phases. Further details are expected by the end of the year.

To achieve this level of coverage across Shetland may require additional investment which will only become clear after Phase 2 modelling is completed and funds are committed, which will be known by the end of 2015.

However, BT will not reach everywhere with next generation speeds and so will only be part of the overall solution. The overall reach and capacity offered is unlikely to be able to support the full economic and social requirements across Shetland.

4.2.2 Mobile

Almost of greater concern is the gap in mobile (3G/4G) connectivity. These services are becoming increasingly essential to modern living and there is no evidence to suggest that the mobile operators will invest in upgrading the infrastructure in Shetland in the near future.

Current provision is patchy with only limited 3G coverage and no 4G coverage. The national operator O2 has a license obligation to provide indoor and outdoor 4G coverage to 95% of the Scottish population by 2017. Of course with Shetland's population being approximately 0.4% of Scotland's, this obligation may not result in any improvement within Shetland.

Any upgrade in the mobile networks to support 3G/4G would almost inevitably require additional fibre infrastructure to support efficient backhaul of mobile traffic.

Consequently, we believe that an evaluation of investment in additional fibre infrastructure as an enabler to increased high speed broadband and 3G/4G mobile is required for the Council to meet its 2020 plan.

4.2.3 Shetland Telecom

The Council's telecom project (Shetland Telecom) has delivered significant benefit across a number of business and communities. There is also some anecdotal evidence to suggest that it also stimulated the market by encouraging BT to invest.

Shetland Telecom currently operate as a "wholesaler" of services and provider of both "active" and "passive" (dark fibre) services to businesses and to Council locations.

Shetland Telecom has also developed a plan to expand the network further including the provision of community "pumps" to enable communities to access broadband faster (and at higher speeds) than would otherwise be possible.

Consequently, we believe that Shetland Telecom has an active role to play in the development of broadband services across the islands; however the model for delivery and service provision needs to be reviewed in detail.

4.2.4 World Class 2020

The Scottish Government's 'World Class 2020' ambition is to ensure Scotland has the right mechanisms, partnerships and commercial models in place to deliver world-class infrastructure in a sustainable way and in partnership with industry.

As part of any business case for investment, the Council should evaluate the above in the context of creating a world class 2020 plan for broadband in Shetland (ie what will work for the islands, the partners and the approach).

The vision of what a world class digital Scotland will look like is set out below. By replacing 'Scotland' with 'Shetland', a vision for Shetland can similarly be set out:

- People choosing digital first, having access to digital technology and being capable and confident in its use at home, at work and on the move. They no longer worry about access to the Internet, caps on usage, slow upload or download speeds, patchy mobile coverage or mobile signal dropout.

- Scotland's businesses having the skills and the confidence to exploit digital technologies, an economic environment that encourages digital innovation and supports the creation, growth and digital transformation of businesses. Businesses take advantage of real time data to deliver innovation, greater productivity and provide better services.
- Scotland recognised as being seen as an attractive place for inward investment in digital technologies.
- All appropriate public services being delivered online, with partnerships being encouraged and valued as a source of innovation and service improvement. Healthcare, education, energy supply and provision, transport, and waste and environmental management have been transformed through the adoption of new technologies, information and ubiquitous access.
- The "internet of things" enabling local Government to manage congestion; maximize energy efficiency, enhance public security; allocate scarce resources and support education through remote learning. Data is being collected and turned into information and knowledge that is further transforming service delivery.
- A future-proofed digital infrastructure supporting any device, anywhere, anytime connectivity across Scotland. This infrastructure is less visible to people, because a majority connect to the internet wirelessly e.g. on mobile devices (tablets, smart phones, etc) or through wireless platforms (e.g. PCs and laptops through home or public space WiFi).

It is clear that these benefits will not be available to people living in Scotland's hard-to-reach areas without significant public investment and long term planning.

The Shetland plan for digital connectivity needs to reflect the Scottish Governments Infrastructure Action plan which outlines the call to make Scotland a world class digital nation by 2020.

This includes providing communities and businesses with a sustainable high speed infrastructure that will deliver digital connectivity across the whole of Scotland by 2020 and that next generation broadband will be available to all by 2020 with an interim milestone to close the digital divide. For Shetland the ambition should be to get ahead of the plan to ensure that it's requirements do

not fall at the end of the 2020 period due to the remoteness and inaccessibility of some locations.

Consequently, it is difficult to see how this ambition can be achieved without Council intervention

Although the Scottish Government has no firm position of what world-class access will look like in the future, they state that:

“technologies available today, like fibre, can provide the future proofed backbone we need to meet future demand at increasing speeds for decades to come”

4.2.5 European Regional Development Funding

The broadband measure under the European Regional Development Fund (ERDF) programme for 2014-2020 is about extending broadband deployment and the roll-out of high-speed networks and supporting the adoption of emerging technologies and networks. The fund is worth €25m (plus 50:50 match) and in Scotland is restricted to the Highlands and Islands. Current indications are that the fund may be used for a mobile project, which could potentially benefit Shetland. Confirmation of plans are due from the Scottish Government by the end of 2015.

4.2.6 Community Broadband Scotland

CBS are working with communities across Scotland with alternative network provision, by providing capital funding and resources to assist communities develop their own solutions. Within the Council area, there is a project underway with Fair Isle to fund a local fibre infrastructure and a high capacity radio link back to Sumburgh. Access to affordable backhaul is an essential component to these projects and can often be a limiting factor in their feasibility.

CBS has a fund of approximately £7.5m for community projects with a further £9m available for aggregated projects that combine neighbouring communities into larger scale projects.

4.2.7 Community Feedback

Appendix A provides examples of the feedback received on the current situation with digital connectivity across Shetland. This feedback is anonymised and was gathered through face-face meetings and through online feedback facility provided by the Council.

Appendix B provides a list of contributors to the information provided in this report.

4.3 Business Needs, Current and Future

4.3.1 Growth in Digital

Currently the average user has one or two devices (typically laptop and mobile) connected to the Internet. This has driven the current bandwidth requirements. Whilst their usage is set to continue, it is the growth in connected devices (wearables, connected homes, connected cars, traffic management, street lighting controls) that is set to fuel the exponential bandwidth growth over the next few years. Predictions are that growth will be from 2-20 devices per person.

Health care in particular is set to be one area where new applications are developed from monitoring to preventative care.

It isn't clear what the bandwidth demands will be from this growth but strategically having the ability to scale services at an affordable incremental cost to enable these new applications will be important to the Council.

4.3.2 Ofcom Report

According to the 2015 OFCOM report on Internet and Mobile usage for Scotland:

“Smartphones are now the most important device for accessing the internet in Scotland “

Interestingly, OFCOM research shows that:

“Half of Internet users aged 16-34 (50%) and more than four in ten (45%) aged 35-54 say a smartphone is the most important device for going online”

It is clear from this research that mobile devices and access to 3G/4G services are becoming ever more critical to consumers and also business.

Further to this, the OFCOM report supports the view that usage patterns are moving from laptop to mobile/tablet and that “time per device” per user is increasing as social media, TV/streaming and “day to day” services are moved onto the Internet.

4.3.3 Industry Trends

“In 2019, the gigabyte equivalent of all movies ever made will cross Global IP networks every 2 minutes”

“The Internet has changed the way people go about their daily lives. Over three quarters of adults in Great Britain used the Internet every day (76%) in 2014, with almost 7 out of every 10 adults (68%) using a mobile phone, portable computer and/or handheld device to access the Internet 'on the go'.

Young adults lead the way across all categories of Internet use. Those aged 16 to 24 used the Internet more than other age groups for recreational activities such as social networking (91%) and playing or downloading games (68%). Adults aged 25 to 34 used the Internet more than other age groups to carry out a wide range of established ‘every day’ activities, such as purchasing goods or services online (90%), Internet banking (71%) and selling goods or services online (36%)” – Source Cisco

Other key trends include:

- bandwidth usage continues to grow exponentially, driven by video streaming and gaming;
- the number of connected devices per household is growing at a rapid rate;
- the numbers of applications used is rapidly increasing;
- In a number of service areas, the Internet has moved to an “essential” tool without which people cannot perform their daily lives.

Consequently, where bandwidth is limited and connectivity is poor or expensive, communities and business are increasingly disadvantaged. From

our meetings there are a number of examples of this in Shetland across all services, ie health, education, economic development, social care and communities.

Cisco is forecasting that, globally, IP traffic will grow 3-fold from 2014 to 2019, a compound annual growth rate of 23% with IP traffic reaching 22 Gigabytes per capita in 2019, up from 8 Gigabytes per capita in 2014.

Consequently, it seems clear that in remote locations, the demands and discrepancies will become ever more apparent with a need for some form of support to enable equivalent and sustainable services to be delivered.

4.3.4 Mobile Developments

In the development of the Internet over the past 20 years, rarely does the demand for services drive the growth of bandwidth, either fixed or mobile. Typically, technology has stayed ahead of the demand curve and become a key enabler to transforming peoples' daily lives.

A good example of this is 3G and 4G mobile services, where at launch there was little or no demand for face to face video across the mobile networks. Indeed, most users would have thought that they would never use mobile video streaming services or video download. But now where the bandwidth is available, there are many applications, social and economic that are driving significant change in the way people work. So the demand is following service availability and consequently fuelling a divide where service is lacking.

This pace of change and bandwidth growth appears to be set to continue and potentially the divide will increase. New applications for online streaming of video such as "Periscope" and other innovations (e.g connected vehicles) will be out of reach for locations without high speed fixed and mobile broadband.

Mobile operators are already developing their 5G services. Vodafone, for example, has revealed that its 5G network will be geared towards supporting machine-to-machine technology, and in particular, connected autonomous vehicles.

"Our vision is to connect every machine which is out there...we are very well-positioned, due to our size, our capabilities and our brand partnerships we have" Vodafone's director of M2M, Erik Brenneis

4.3.5 Public Health

“Well designed and sustainable communities, with people able to access the amenities and services they need” – Corporate Plan

Feedback from the community and 1-2-1 sessions seemed to suggest that the lack of available online services due to restricted bandwidth is increasing displacement and technology could be a key enabler to keep people elderly people in their own homes for longer in safer way.

Global health monitoring through connected services (video, wearables, smartphones) is currently one of the fastest growing and most influential sectors in the world with 3 million people expected to be using smartphone-powered remote patient monitoring devices by 2016.

The opportunities afforded to remote communities are potentially the most significant, but connectivity and mobility are two of the most critical enablers to success.

There are a number of applications that NHS Shetland could implement to meet the e-health 2020 targets, particularly in hospitals, but also in the field that could improve healthcare efficiency, significantly reduce travel for staff and patients and more importantly improve care.

Remote support from GPs for pre-diagnosis and after care support using video engagement with patients could ultimately be provided at home for patients but initially could also be delivered at a local community points “health hubs” if sufficient bandwidth and accessibility could be provided.

Access to expertise in remote locations through video conferencing with hospitals in Grampian and potentially further afield, could also be developed more extensively.

Access to mobile and fixed “operational and admin” systems for job scheduling and work allocation required by mobile staff will also improve efficiency, reduce travel time and costs.

Initially it may be worth considering creating community hubs where sufficient bandwidth could be concentrated for some tele-health services to be provided unless this could be extended to all homes.

Beyond the needs and benefits of tele-health services to both the community and clinicians there may also be an economic development opportunity for NHS Shetland to attract and develop expertise locally either by way of personal expertise being offered to other regions (or further afield) through remote tele-health facilities or through Shetland choosing to host and manage some services that could be offered to other NHS regions.

This could potentially encourage high level expertise to the area that would otherwise have not considered being based in Shetland due to geographic and communication constraints.

4.3.6 Telecare and Telehealth

The Joint National Delivery Plan from the Scottish Government, CoSLA and NHS Scotland, sets out the vision and direction for a Scotland in which the use of technology will be integrated into healthcare development and delivery, to transform access and availability of services in our homes and communities.

Technology-enabled care is vital to the successful delivery of this vision. NHS 24 is delivering a Technology Enabled Care Development Programme comprising five related workstreams, one of which is to investigate the transition of Telecare within Scotland from analogue to digital technology. The National Telehealth & Telecare Delivery Plan aims to enable greater choice and control in healthcare and wellbeing services for an additional 300,000 people by March 2016, enabling more citizens to remain at home and in their communities.

There are a range of potential benefits of digital Telecare which fall into four main themes:

- **Reliability** – Potential benefits relating to improving the reliability and quality of Telecare services, or ensuring the continuity of Telecare;
- **Efficiency** – Potential benefits relating to improving the efficiency of Telecare. These relate both to efficiencies gained through improvements in delivery methods and utilising increased sharing of information/partnership working to broaden services;
- **Additional Functionality** – Potential benefits obtained by using digital technology to deliver new Telecare functionality and services;

- **Telehealth** – Potential benefits obtained by using digital Telecare technology to support the delivery of Telehealth services.

To deliver digital Telecare a broadband connection is required to a subscriber's home. This broadband can either be fixed (i.e. DSL or cable broadband) or delivered using wireless (i.e. connecting to a mobile telephone network). Although figures for broadband availability in the UK are extremely high, many of the remaining areas unable to obtain broadband, or obtain high speed broadband services, are in Scotland. In the short/medium term obtaining access to broadband services capable of supporting advanced Telecare / Telehealth services is likely to remain an issue in some areas of Scotland, particularly in remote/Island communities.

4.3.7 Education Services

From the 1-2-1 sessions with representatives from Schools and the community feedback, a number of demands for increased bandwidth for broadband services became evident.

There is a short term “pinch point” for schools connectivity whereby staff cannot use the required administrative/operational system “Glow” (Scottish Schools National Intranet) due to slow bandwidth connections. This performance gap is only likely to increase as services across Glow are increased.

These include the following:

- Webconferencing, including audio and video connections;
- Blogs & Wikis – to enable individuals and classes to work together on one ‘canvas’;
- Mail, Chat & Messenger a messaging and mail system accessible by every teacher;
- An integrated Virtual learning environment allowing nationwide sharing of resources and creation of teaching courses;
- Groups - Sub-sites which can be created by teachers in each establishment for a variety of purposes;
- Discussion boards and shared document Stores.

Schools without the minimum connectivity required to support “shared services” such as these will be disadvantaged.

In addition, the growing bandwidth requirement for remote learning and access to global resources for pupils will mean that high speed broadband for education is increasingly a necessity.

Consequently, we would conclude that there is a minimum requirement for high speed broadband (ideally through fibre) to all schools, and a need to look at a specific GAP analysis of the potential impact of pupils not having broadband available in a home environment.

4.3.8 Economic Development

Over the last 5 years there are some good examples where the availability of high speed connectivity has driven economic benefits for the islands. Of course it can't be clear whether these businesses would not have existed or located without the Council/Shetland Telecom fibre availability, but it seems likely that would be the case.

- Shetland Broadband – now has over 3000 connected devices and services communities and workers. A real business success created through the availability of high speed broadband;
- The fish exchange/auction– an international success story and helped revitalise a traditional industry through on-line high availability services;
- Grieg fish farm – an international business connected to services in Denmark who operation and profitability without high bandwidth services would have been severely limited.

These examples, alongside the connectivity to Oil and Gas facilities for companies such as Petrofac, Total and BP, illustrate the economic benefit to the islands directly as a result of the Council strategy to invest in fibre connectivity.

Notwithstanding the long term benefit of improved connectivity across the islands as an enabler for economic growth, there are some immediate projects and initiatives where significant bandwidth/fibre connectivity will be required and the Council should consider both how these projects will be fulfilled and if/how they could be used as “anchor” projects to drive increased connectivity. Many of these projects could not happen without high bandwidth connectivity.

The projects identified through the 1-2-1 session and the community consultations include:

- The new SSE power station which will require fibre connectivity both for systems and operational control;
- The Gas sweetening plant which will require control systems and operational admin systems;
- Tidal generation developments will require fibre for control systems;
- Viking windfarm and an additional windfarm at Yell will require control systems for the turbines;
- The new fisheries facility will require high bandwidth connectivity for the on-line auction and administration systems.

4.4 Potential scope and service requirements

4.4.1 Options Evaluation

The scope for the project will need to be developed in the context of the Green book model for delivering value from proposals, namely that the intervention is supported by:

- A compelling case for change and that the intervention represents best public value;
- The proposal is attractive in the market place and can be procured;
- The proposed spend is affordable;
- That what is required is achievable.

The options open to the Council for scope of any intervention to aid market development of broadband services include the following:

1. Council to establish partnerships that will encourage vendors to develop infrastructure but the Council takes a hands off role to building and funding;
2. Develop Shetland Telecom further “as is” with current model with Council operating wholesales services;
3. Council expand the current fibre infrastructure as a “dark fibre” “passive” network including working with the mobile operators to deliver fibre to mast infrastructure to stimulate 3G-5G infrastructure;

4. The Council continues to intervene and develops the “Village Pump” model to help community groups develop their own programs.

Evaluation of the potential options will be completed and considered against the following attributes:

Table 1 Options Evaluation Matrix

	Can be procured	Commercially viable	Affordable	Achievable	Strategic fit
Option 1 - Council to establish partnerships that will encourage vendors to develop infrastructure but Council take hands off role to building and funding					
Option 2 - Develop Shetland Telecom further “as is” with current model with Council operating wholesales services					
Option 3 – Council expand the current fibre infrastructure as a “dark fibre” “passive” network including working with the mobile operators to deliver fibre to mast infrastructure to stimulate 3G-5G infrastructure.					

Option 4 - The Council continues to intervene and develops the "Village Pump" model to help community groups develop their own programs					
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4.5 Benefits Criteria

This section captures the key benefits associated with the proposed options and lays out a format evaluation of the benefits in line with the Government's green book guideline for business case evaluation.

There a number of key benefits that the Council could realise through expansion of broadband services, and these would be both quantifiable (cash releasing) and non-quantifiable (qualitative) in nature. Detailed work is required to complete the benefits case, particularly around the evaluation of cash impact to the Council and the wider economy.

A high level allocation of benefits based on the work completed to date is as follows:

- Development of new business economic growth both organically and from inward investment;
- Efficiencies in services delivered for health, social care and education through the delivery of new services;
- Reduced future costs for connectivity across the islands for all users;
- Improved social and health care resulting in reduced healthcare costs;
- Improved social wellbeing and social inclusion across remote location in particular;
- Reduced number of young people leaving and potential for high value workers to stay;
- Improved social services and access to services from across a wider population;
- Potential for new services to be offered across Shetland, both council and other 3rd party services that are currently restricted through lack of bandwidth;
- Binding together of communities for a common purpose to improve services in the community.

Benefits should be classified in each instance as a direct benefit to the Council and indirect benefit (ie health, education, social care, economic), once the detailed benefits case has been established. The allocation of direct and indirect benefits can be determined and per the Green Book requirements the relative value, or weight, of each spending objective.

During evaluation these can then be scored and weighted by qualitative and quantitative values.

Table 2 below provides a draft table to aid scoring and evaluation of benefits at the next stage and will be completed for each of the identified options.

Table 2 – Draft Benefits Evaluation (Options 1 – 4)

Benefits Allocation	List of Benefits	Direct / Indirect Impact	Strategic / Operational	Cash Releasing Value (High/Med/Low)	Benefit / Growth Value (High/Med/Low)	Qualitative Benefits (High/Med/Low)
Economic Development						
Total Economic Benefits						
Health						
Total Health Benefits						
Social Care						
Total Social Care Benefits						
Community Benefit						
Total Community Benefits						

4.6 Strategic Risks

There are a number of strategic risks that the Council should be aware of associated with any decision to intervene/not intervene in the market and/or invest/not invest in infrastructure.

We believe that generally these are well understood to the Council:

- Any intervention that cuts across exiting Scottish Government contracts with BT or other vendors may well cause potential removal of centrally funded investment;
- Any investment by the Council may cause BT to raise objections at a regulatory level and potential legal objections;
- A failure to invest by the Council may result in Shetland being overly reliant on BT/Scottish Government funding and leave the islands “at the end of the queue” for any service improvement;
- It is likely that if the key vendors invest, funded by the Council, they will do so to the minimum contracted level only – this may result in further tranches of funding being required in future years that the Council cannot afford;
- There are significant risks of economic, social, health and education gaps widening if the Council let market forces alone drive broadband and mobile infrastructure investment.

4.7 Constraints and Dependencies

A number of potential constraints and dependencies exist that need to be considered by the Council prior to any project approval. These include;

- Regulatory controls including OFCOM regulations;
- Funding dependencies, around any future funding, but also the existing obligations under the initial EC funding that was granted and any impact on Scottish Government/HIE funding for BT projects;
- State Aid considerations;
- Council resources, financial and other.

APPENDIX A

FEEDBACK ON CURRENT SITUATION

APPENDIX A – FEEDBACK ON CURRENT SITUATION

The following provides examples of the feedback received on the current situation with digital connectivity across Shetland. This feedback is anonymised as far as possible and is grouped around key issues, although some may cross a number of issues. The feedback was gathered through face-face meetings and through online feedback facility provided by the Council.

Health	<i>The NHS struggle with work allocation, and diary management is a major hindrance in evolving digitised patient records.</i>
	<i>National funding model for NHS prohibited using Shetland Telecom.</i>
	<i>There are Islands where people have dementia and can't stay in place because no care can be provided.</i>
	<i>E-health plan can't be embraced due to bandwidth/reliability issues.</i>
	<i>Health services will not be able to take advantage of the latest advances in telemedicine, something which is very relevant to a Shetland setting.</i>
	<i>As a disabled person and stuck in the house, I use the internet for everything Banking Shopping and contact with family and friends far and wide. The internet is all the social life I have.</i>
Shetland Telecom	<i>Shetland Telecom fibre has been a huge boon to the islands.</i>
	<i>Given that BT are not going to be able to help a large proportion of people especially in rural Shetland, without obscene subsidies. The SIC should as soon as possible move on completing their originally planned Shetland telecom rollout providing "digital village pumps" It is then fairly straight forward for communities to develop their own local solutions around this. provision of good quality high speed internet can also be a massive economic driver.</i>
	<i>I would like to see a concerted effort to expand the cable network throughout the islands, but ahead of that I think the priority should be to bring the outlying islands Unst, Yell Whalsey etc. to parity with the majority of the mainland.</i>

	<i>I would advocate that SIC support the extension of Shetland Telecom's cable network. It has proved to be very far sighted investment.</i>
	<i>If any improvements are made to the Shetland infrastructure it should be to bring the situation into line with the best international standard.</i>
	<i>Complete replacement of the existing telephone infrastructure in Shetland with fibre optic connections to every address. The council should have complete control of the network to make sure that BT are expelled from the islands.</i>
	<i>I'd hope the council could influence internet/mobile service providers to improve their coverage/network of public supply.</i>
	<i>If the council being involved in will result in improvements being made sooner and out to rural areas then the council should be involved.</i>
	<i>There has to be public-sector intervention. The Council does deserve huge praise for its involvement in Shetland Telecom and, especially, for the free Guest wifi in so many public places. But more is needed.</i>
	<i>Whatever happened to the plans to provide a community based service using the SIC internet service as was promised a number of years ago?</i>
Education	<i>Online processing is impossible for rural schools to use & online learning/becoming ever more important.</i>
	<i>Education will be adversely affected with risks to our children's educations and possible questions over the UHI if the connections are not there to support its operations.</i>
	<i>The issues for me is that we are getting to a stage where we are expected to be able to do things which our services cannot provide, for example my course tutors may expect me to have a Skype based meeting with them but won't be able to because of poor connection and my Company often tries to phone my mobile phone</i>

	<i>but can't get a hold of me due to lack of signal.</i>
	<i>We have found that the internet is too slow for the most basic websites for our young children to look at small cartoon clips or download games from cbbc, Lego etc.</i>
	<i>Over the next few years we fully expect that the slow broadband will affect our children schoolwork.</i>
	<i>The current unreliability of broadband connections and routinely slow connection speeds often have a serious impact on my ability to study effectively. OU courses, in common with those of most other educational institutions are increasingly dependent on the Internet and the emphasis on interactive-working skills is becoming far more significant; I am sure there are many other younger folk in Shetland for whom distance learning is far more critical and important to their future careers/employability and for whom the current poor broadband coverage presents a serious limitation (if it doesn't put them off altogether).</i>
	<i>As our children become older we worry that they would be disadvantaged for homework as our broadband is so poor.</i>
	<i>I can't download any Uni data, anything educational for my children as it can take a day sometimes. I have to venture to Lerwick to download anything.</i>
Community	<i>Maximum benefit is delivered to those who are most remote and most isolated.</i>
	<i>BDUK, doesn't address outer isles.</i>
	<i>Suggest the plan should be to connect as many people as possible with a good functional system, rather than focussing on key centres and giving them a fantastic system.</i>
	<i>Young people will want 3g/4G services.</i>
	<i>I hope that others will address the issue of how those in our community who cannot afford the subscriptions can be helped to gain access to the network.</i>

	<i>I wanted to pass land to my children to build houses in the local community. They said no, there is no connectivity. So we developed a community scheme and brought broadband to our community and now my family are building houses and remaining in the community.</i>
	<i>Communication and information are the main benefits of digital services. It would also enable businesses, especially rural ones, to have a more level playing field. If we are to keep our young folk we need the IT revolution to come to Shetland.</i>
	<i>Socially increasingly entertainment content is streamed or downloaded. Use of Social media e.g. facebook is now an integral part of modern life. Many people in Shetland do not currently have a service capable of supporting these services and are therefore effectively socially excluded. As services become more complex and more commonly are likely to be used in "real time" there will be increasing requirements for much faster services.</i>
	<i>Digital connectivity in future will be critical to how we live, it will be as important as roads, electricity or water supplies. If they don't perform we will be unable to do our jobs or to be socially connected. Both items which could mean an exodus from these islands. By providing a world class level of service our communities will be able to reap all the benefits of the "digital revolution" and it will help to attract people.</i>
	<i>Disenfranchisement of the populous, particularly those on the outlying islands. This will ultimately lead to continuing depopulation of these areas which will have a significant impact on the economy and therefore quality of life for those unable or unwilling to leave.</i>
	<i>Let me put it this way, if internet connectivity doesn't keep pace with the mainland (and by that I mean at least reaching levels consistent with mainland services five years ago) then I would seriously consider where I live! There's no way I could cope on Unst!!</i>
	<i>If it doesn't get better and we are increasingly left behind I would consider relocating, perhaps to an equally attractive area in</i>

	<i>Scotland which has a better service.</i>
	<i>More and more reliance is placed upon your ability to go online. Eventually, it will be very difficult to live any sort of normal life if there is not a high speed broadband connection.</i>
	<i>The risks are Shetland being left behind economically and socially, especially the outlying islands and rural areas. These at risk communities stand to lose the most from the current poor service continuing.</i>
	<i>Neglect the digital age at your peril! This is a priority for the social cohesion of our community and needs to be seen as such.</i>
	<i>If Shetland cannot keep pace or even get workable speeds and coverage then we will be left behind. We will become far more remote than we are by way of geography.</i>
	<i>We would like to email photos of children to family but sending attachments takes ages and often times out or just fails.</i>
	<i>The Internet is the ideal tool for overcoming some of the constraints of peripherality, but many remote communities cannot, as yet, benefit from its full potential. Time for a bit of positive discrimination I think.</i>
	<i>If we want to have people living and working in rural areas, broadband in particular needs to be as universally available as water or electricity.</i>
	<i>Two tier society of areas with excellent Fibre service (Mainland) and rural areas with very poor service. Consequent decline of rural areas and pressure on housing/services in Mainland areas.</i>
Economic Development	<i>Internet critical to business, 38 businesses in Unst and <1MB available for most people. File sharing and Skype (video and audio) applications can't be used.</i>
	<i>Fish auction requires international connectivity and time critical live data feed. New customers require video connections.</i>
	<i>I sell direct to the public from my studio, people now expect to be</i>

	<i>able to pay electronically, particularly via paypal. They are unable to use their phones to do this due to no signal.</i>
	<i>I welcome the opportunity to contribute to the discussions on how SIC might be able to develop High-speed broadband in the isles. I sell my Native Shetland Lamb via my website across the UK and this is an issue I have been engaged with for 18 months. I am one of those who are actively pursuing a community broadband solution for Stromfirth in the Gott Exchange area. I will contribute separately about the specifics of the situation in Stromfirth except to say that our community solution is only viable because Shetland Telecom operates an open access policy. Shetland Telecom's existing network passes through our district giving us a straight forward backhaul solution.</i>
	<i>Can't run my business well when not in the office as cannot get Internet. I will loose more business if connectivity doesn't improve.</i>
	<i>Reducing social isolation. Allowing local businesses to function efficiently in rural locations. Reducing reliance on cars for commuting into work in Lerwick that could potentially be done from home. (Needlessly braving icy ungritted roads in the winter.)</i>
	<i>Shetland risks being regarded like a third world country. There would be significant negative effects on business with current businesses struggling to meet regulatory requirements and being at a huge competitive disadvantage to those with access to real high speed access.</i>
	<i>There is a danger with limited digital services leaving people and small business behind. Even with my small scale business this is a problem, it means that images and documents I send need to be reduced in file size and a number of images have to be sent over various emails. It doesn't look professional when viewed against competitors.</i>
	<i>Employment can be provided via good communication links. People choose locations to live for their own reasons. Commuting is more and more unsociable with transport links suffering because of cutbacks, and much work could be spread throughout Shetland if</i>

	<i>communication lines allowed.</i>
	<i>Without connection to the modern essential network, people will be forced to move where there is a connection. Skilled population leaving will cripple communities.</i>
	<i>Seen as a backwards thinking community and not a place to do business. Folk will not come to Shetland, often the first question I am asked is about connectivity when recruiting from south. Highspeed broadband is now seen as an essential and not a luxury.</i>
	<i>I am constrained in my professional work by the speed (lack of) of my upstream and downstream connection as my main client is in Edinburgh. This usually means that I have to drive into Lerwick where I can use a hi-speed connection to transfer my files or indeed send by mail if the deadline permits, with all the hassle and waste of fuel that this entails. A proper hi-speed connection, either through BT or a community based "hotspot" would enable the expansion of my business and indeed make other creative opportunities for younger people wishing to enter the profession thereby retaining some of our young people here in the Isles.</i>
	<i>Employment in rural areas is limited to several very lucrative and "critical to Shetland" industries such as fishing and Fish farming. Allowing people to diversify is a must.</i>
	<i>Digital development is utterly key to Shetland's economic future - it would be absurd to believe otherwise. The current digital capability is sorely lacking, and it's hard to comprehend given the amount of lip service given to this issue over the past 10 years.</i>

APPENDIX B

LIST OF CONTRIBUTORS

The following departments, businesses communities and individuals contributed to the information provided in this report. This includes contributions from the following people (our apologies to anyone who have been missed off this list)

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- Rick Nickerson (Community Council)
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- David Thomson (Shetland Library)
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