Regional Applications for a Digital Economy

Southwest Alaska Municipal Conference
December 2012

This report made possible by a USDA Rural Development
Rural Business Opportunity Grant
Dear Southwest Alaskan,

As an economic development organization, the Southwest Alaska Municipal Conference (SWAMC) has always focused on the issues and opportunities that seek to better our local economies and quality of life in the region. Oftentimes, efforts are directed at fishing and seafood industry development for our coastal communities, or tourism marketing and workforce priorities. In the past several years, it’s meant a greater emphasis on bringing down the burdensome cost of energy that threatens our economies and puts a dent in home savings and business investments. But more recently, a few technology infrastructure upgrades have opened the Southwest region to new opportunities for educators and students, health care providers, local governments, and most promising, for businesses and entrepreneurs. This technological advance is broadband internet, and it is helping to bring remote corners of Alaska online with the rest of the globe.

Technology leaps can move at warp speed, quicker than many of us can fathom. Just think: the first commercial airline flight in the United States occurred less than ten years after the Wright Flyer III was capable of fully controllable, stable flight over the prairies of Ohio. The first iPhone was released a little over 5 years ago, and today smartphones are ubiquitous, even in rural Alaska. And now, the Terra-SW project has brought fiber optic internet to the Bristol Bay region, not long after fiber connected the Kenai Peninsula to Kodiak Island in 2007. These systems allow for more bandwidth, faster data speeds, and greater reliability to meet our region’s expanding telecommunications needs. This is good news for our industries, our first responders, and average Southwest Alaskan looking to stream a movie from home or videoconference with friends and family far away. Not all of our communities will experience fiber connections in the next year or even the next decade, however. But improved satellite capabilities could also afford greater opportunities for our area- even to the remote regions of the Aleutians and Pribilof Islands- as this report will illustrate.

So as we transition to a world where we read our newspapers on a tablet and check our email and weather reports on a phone, the Southwest Alaska region needs to prepare for a future positioned to take advantage of broadband. Regional Applications for a Digital Economy is meant to provide policymakers, local leaders, business owners and other Alaskans with strategies and policy recommendations that will take us to the next technology leap and beyond. All Alaskans deserve the best telecommunications access we can provide. But they also deserve the tools and resources to make the most of this technology, because our greatest achievements are not built on a piece of fiber or the latest smartphone; true progress comes from our ability to utilize technology to transmit ideas and innovations in our businesses and communities.

Thank you for reading, and feel free to contact SWAMC to discuss broadband and this report.

Sincerely,

Shirley Marquardt, SWAMC Board President
Executive Summary

Broadband internet has become an important driver of economic and community development in the 21st century, and its value is further enhanced in rural areas. Unfortunately, due to lack of access, many rural communities in Southwest Alaska have yet to realize the social and economic benefits of faster connectivity.

The 2010 Southwest Alaska Municipal Conference (SWAMC) report, *Southwest Alaska Broadband Strategy: Planning for Opportunity*, identified a need for enhanced internet access in Southwest Alaska. It proposed that adoption of faster broadband internet in the region would increase the quality of life for residents in many ways. Having access to faster and more reliable broadband internet connections in Southwest Alaska will enhance residents' access to education, healthcare, commerce, public safety, and government.

This 2012 report, *Regional Applications for a Digital Economy*, expands on previous research and compiles user feedback to outline the steps necessary to integrate broadband into the lives of rural Alaskans. It summarizes the current state of broadband access in Southwest Alaska, and how users in the region have adopted the currently available services. With a focus on broadband application development, the report offers recommendations for improving access to and adoption of broadband internet services in the region. Many of the insights, strategies, and policy recommendations presented in this report were developed from focus groups representing key sectors of economic activity in the SWAMC region. The action plans defined in this report are a priority of regional and community leaders interested in using broadband to its fullest potential.

Economically competitive communities aggressively manage strategies to increase their use of technology in education, health care and job creation. Broadband is an essential utility on which technology-based innovation fosters and drives economic competitiveness, improves services, and reduces costs. Physical barriers prevent broadband from reaching its full potential in the SWAMC region; a dispersed population spread over large distances hinders straightforward connectivity between communities. Despite these challenges, connectivity is prevalent, hardware platforms are diverse and adoption is underway, and existing networks enhance lives and productivity in the region. The table below provides an overview of network connectivity speed and level of service by sub-region.

*Connection Availability and Monthly Costs in SWAMC Region*

<table>
<thead>
<tr>
<th>Network Connection Service Level</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Microwave</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic</td>
<td>Fastest</td>
<td>Basic</td>
</tr>
<tr>
<td>Kodiak Region</td>
<td>$50</td>
<td>$130</td>
<td>$60</td>
</tr>
<tr>
<td></td>
<td>10 Mbps</td>
<td>22 Mbps</td>
<td>1 Mbps</td>
</tr>
<tr>
<td>Bristol Bay Region</td>
<td>$60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>512 kbps</td>
</tr>
<tr>
<td>Aleutian Region</td>
<td>$65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>512 kbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Prices as of November 1, 2012*

Drawing on successful utilization of network resources, this report contains a case study of broadband adoption in Minnesota and input summaries from focus groups and surveys.
Appendix A outlines a successful program in rural Minnesota – the Minnesota Intelligent Rural Community Program – in which eleven rural communities created community coalitions to spur adoption of broadband and increase their use and technological sophistication throughout the community. Appendix B provides an example of demand aggregation by an anchor tenant to spur fiber deployment. Analyzing these successful strategies is helpful to understand and overcome barriers to more effective network capabilities in the SWAMC region.

Observations from the Minnesota example allow for insight into activities that could increase adoption:

1. Expand access to broadband through open wireless hotspots.
2. Expand the Knowledge Base by providing training and educational incentives.
3. Incorporate innovative means of replacing physical activities with digital services, saving time and increasing opportunities.
4. Develop programs that facilitate access to devices and a network connection.
5. Market digital applications that enable local institutions to be more efficient and effective in delivering services.

This report identifies the following critical findings in the SWAMC region:

1. The region has wide variation in levels of available connectivity; significant portions are likely to be dependent on satellite-delivered broadband in the foreseeable future.
2. The region’s technologists, especially in schools and health care facilities, are pushing the highest possible levels of applications across their networks, constrained by available bandwidth.
3. Most organizations are focused on solving their own connectivity issues by themselves or within their economic sector rather than at the community level.

The following recommendations identify priority strategies to utilize broadband value in Southwest Alaska:

1. Raise the level of interest and concern about broadband.
2. Form and support a regional technology council to develop collaborative broadband access and adoption strategies.
3. Provide local businesses with e-business training and consulting they need to succeed in the digital marketplace.
4. Encourage use and development of broadband applications.
5. Support at least one community location where residents have access to high-speed internet connection of at least 20 Mbps.
SWAMC should consider the following policies to help promote broadband expansion:

1. Universal Service Fund (USF) regulations should be made more flexible so that in remote communities, USF funded broadband may be more widely accessed.
2. The State of Alaska should ensure that every school meets the “100 Mbps per 1,000 students or 10 Mbps per 100 students” standard set by school technology experts.
3. Every Alaska student should have access to an internet-enabled device and broadband connectivity.
4. Every Alaska community should have at least one location where community members can access high-speed internet connection of at least 20 Mbps; this could be a school, library or other community center.

Broadband access and use are growing across the world. The Southwest Alaska region is benefitting from some deployment but continues to fall behind the increasing pace of very high-speed internet services. With no easy answers, regional leaders must increase their focus on everything broadband - from national policies to local adoption through all facets of the community. The next-generation economy will educate, trade, work, and live through networked communities; the backbone of that lifestyle will be a broadband connection. This report outlines the next steps necessary to achieving those goals.

Southwest Alaska Municipal Conference
Regional Applications for a Digital Economy
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The Southwest Alaska Municipal Conference (SWAMC) is a non-profit regional economic development organization for Southwest Alaska. SWAMC serves three sub-regions of Southwest Alaska: the Aleutian/Pribilofs, Bristol Bay, and Kodiak. Find out more at www.swamc.org.
1. Introduction

The Southwest Alaska Municipal Conference (SWAMC) retained Minnesota-based Community Technology Advisors Corp. (CTAC) to bring their rural-focused broadband and economic development expertise to Rural Alaska. CTAC’s business model is to work with local leadership to develop and implement initiatives to improve both broadband infrastructure and broadband utilization in rural communities. This expertise was vital in developing a forward-looking broadband strategy to overcome the challenges of integrating advanced internet technology into local economies in the SWAMC region.

The Regional Applications for a Digital Economy (RADE) project recognizes the significant shortcomings of broadband infrastructure in many parts of the region and required a report that addressed elements of both infrastructure and applications. In addition to this written report, content contained in an online application toolkit (http://www.swakbroadband.com/toolkit) provides application examples from Alaska and elsewhere, categorized by economic sector and minimum broadband speed.

2. Broadband Access Today

Broadband has been a disruptive technology that has necessitated strategic change in every sector – some easier than others. Individuals, businesses and governments ignore or underestimate change at their own peril. Internet applications such as Amazon, Facebook, or Netflix provide consumers with adequate network connectivity, to the same content anywhere on the globe; online access to information has been a game changer. Broadband is also a game changer for community entities, such as the local bookshop, which now competes with booksellers around the world, both large and small. This requires a significant shift in their business model, to where adopting technology is the best strategy to remain vital. Southwest Alaska must act to fully embrace broadband technology and drive deployment and use across all economic sectors, at the community and regional level. Currently, Southwest and the rest of rural Alaska are losing ground on broadband connectivity to other states and countries.

National Broadband Plan

The National Broadband Plan, released by the Federal Communications Commission in 2010, sets a goal for 100 million homes to be connected with 100 Mbps broadband connections nationally by 20151. The benchmark for adequate broadband service in the rest of America, generally rural America, is defined as 4 Mbps downstream and 1 Mbps upstream. This essentially creates a three-tiered system in the United States: 1) those that have the world-class standard of 100 Mbps service, 2) those that have 4 Mbps standard of service, barely adequate for today’s use, and 3) those that lack even adequate service.

Homes, and especially businesses, not meeting the 100 Mbps connection speed will be at a disadvantage compared to those who do, both in the US and around the world. It is important to remember that a limited, but growing, number of global communities already have 1,000 Mbps services. Communities with 4 Mbps broadband services can at least

partially participate in today’s society; those below the 4 Mbps standard will be left behind in their ability to access quality education, obtain health services, find employment and enjoy a high quality of life. Until now, much of rural Alaska, and especially Southwest Alaska, has lacked broadband services that meet the 4 Mbps federal standard, which means Southwest Alaska is trailing in broadband connectivity. Akamai’s latest “State of the Internet” report indicates that the US ranks 12th in international comparisons of average connection speeds with an average of 6.7 Mbps (Figure 1).

Figure 1: The U.S. ranks 12th internationally among countries with average internet connection speeds of 6.7 Mbps (Source: http://www.akamai.com/stateoftheinternet/).

Statewide Statistics

The State of Alaska’s Broadband Task Force vision statement sets a goal of 100 Mbps connection speed to every person in Alaska by 2025². At the time of this report, the Task Force was putting together their strategy for reaching that goal. Connect Alaska (http://connectak.org) is charged with tracking and mapping broadband connectivity in Alaska. As Figure 2 illustrates, most of Alaska currently falls far short of the Task Force goal, with the fastest rates available reaching 6 – 10 Mbps. Outside of Kodiak, all of Southwest Alaska is woefully behind in this regard (or has insufficient data, which is an indicator of inadequate access).

**Impact of Federal Policy**

Supporting anchor institutions is a critical element of federal broadband policy. Anchor institutions include schools, universities, hospitals, clinics, libraries and other community use facilities providing high-speed broadband. They are critical as government-supported institutions that help maintain the economic and social vitality of communities, indeed, to all of rural Alaska, and will likely play a larger strategic role of increased future use and access. Through regional and/or statewide collaborations in online education or tele-health, anchor institutions are often quite sophisticated in their use of broadband, and can be a primary driver in creating value. A clinic using home tele-health technology for monitoring post-operative or chronic health conditions can save in healthcare costs compared to longer hospital stays. Streaming the world’s best health, education and social content to public use facilities connects rural communities to the global economy.

Across the country, anchor institutions can take advantage of federal Universal Service Funding (USF) to subsidize their broadband connections. Subsequently, these organizations are generally well connected, especially when compared to the private sector. Unfortunately, the same policies that have supported network development for anchor institutions have often created policies that prevent, if not outright prohibit sharing the institutional network with local households and businesses. While these subsidies allow anchor institutions the ability to subscribe, many businesses and residents cannot afford to pay the full retail price for services. The impacts of USF restrictions are significant everywhere in rural America. Today, where affordable and quality broadband is widely available, these restrictions have significantly less negative impact; in rural Alaska, restricting USF facilities is a major roadblock to more integrated and connected communities.
Alaskan Internet Service Providers, especially outside of Anchorage, face extraordinary expense to deliver services across long distances to sparsely populated areas. Likewise, these anchor institutions are generally using much less bandwidth than their peers across the continental US, due to the absolute lack of available bandwidth and considerable infrastructure costs. Their constituents cannot benefit from online services at the same rate as in other areas. In the National Broadband Plan, federal policymakers have discussed changing USF policy, which will create new opportunities for rural areas such as those in Southwest Alaska. When anchor institutions are permitted to share broadband with community members, it will open the door for new partnerships to deploy an integrated community broadband strategy.

Southwest Alaska Connectivity

Connectivity in Southwest Alaska is challenging and uneven, where each sub-region and community finds itself with a unique set of circumstances. Every community has a distinctive combination of telecommunications options, school assets, health care providers, tech support companies and local tech gurus. Figure 3 shows connectivity highlights at a more granular level. Table 1, below, provides some notes to expand on this information. The Connectivity Highlights Map and notes provide some detail on connection mediums within the region. The green dots represent TERRA SW communities with a microwave connection; the yellow dots are USF funded libraries that provide public access. Network technologies range from 100 percent fiber on the Kodiak road system to Satellite-only availability in the Aleutians (and other small remote populations), with a microwave backbone filling the gap in Bristol Bay.
Table 1: Select Highlights of Current Internet Connectivity in Southwest Alaska

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>Place</th>
<th>Opportunities*</th>
<th>Constraints</th>
<th>Application Toolkit Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Fiber</td>
<td>Kodiak Road System</td>
<td>High bandwidth applications</td>
<td>Relative cost compared to Railbelt; lack of similar connections to villages</td>
<td>Fast speed applications</td>
</tr>
<tr>
<td>Satellite – fed fiber local loop</td>
<td>Adak</td>
<td>High bandwidth in Adak; low to moderate bandwidth externally</td>
<td>Cost of satellite bandwidth; latency of satellite middle mile; download caps</td>
<td>Fast applications locally; medium speed applications to external connections</td>
</tr>
<tr>
<td>Satellite – fed copper or wireless local loop</td>
<td>Aleutian communities</td>
<td>Low to moderate bandwidth within community and externally</td>
<td>Cost of satellite bandwidth; download caps; latency of satellite middle mile; capacity of local loop</td>
<td>Slow to medium applications</td>
</tr>
<tr>
<td>Fiber-microwave backbone w. local loop</td>
<td>Terra SW Areas</td>
<td>Moderate to high bandwidth internal and external; dependent on last mile technology</td>
<td>Limitations of last mile technology that may limit high bandwidth applications</td>
<td>Medium speed applications</td>
</tr>
<tr>
<td>Satellite only</td>
<td>Home or Individual Networks</td>
<td>Low to high bandwidth opportunities</td>
<td>Latency; download caps; availability</td>
<td>Slow to high speed applications depending on bandwidth caps</td>
</tr>
</tbody>
</table>

*For tangible examples of what an end user can do with various level of bandwidth (high, moderate, low….) check out the Southwest Alaska Broadband Tool, developed for SWAMC: [http://www.swakbroadband.com/toolkit](http://www.swakbroadband.com/toolkit)

**Network Enhancements**

The good news is broadband improvements are coming to Southwest Alaska. However, local leaders should ask themselves: Is this enough? Is it reaching enough people? Is it affordable? Most importantly: Does this meet our current needs and will it meet our needs into the future?

**Terra SW**

The primary regional network improvement comes from deployment of GCI’s Terra Southwest Project that combines fiber optic and microwave wireless technologies to improve middle mile broadband access for Bristol Bay communities. The Connectivity Highlights Map above identifies impacted communities as those with green dots. GCI received a $44 million dollar grant through federal broadband stimulus funds and a $44

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3 Middle Mile definition from Wikipedia: In the broadband Internet industry, the "middle mile" is the segment of a telecommunications network linking a network operator’s core network to the local network plant, typically situated in the incumbent telco's central office, (British English: telephone exchange) that provides access to the local loop, or in the case of cable television operators, the local cable modem termination system. [http://en.wikipedia.org/wiki/Middle_mile](http://en.wikipedia.org/wiki/Middle_mile)
million dollar loan from USDA Rural Utility Services for this project\(^4\). The stimulus package was a unique opportunity; federal stimulus funds are not likely to be available to finance expansion to this extent in the foreseeable future. Terra SW is designed to provide improved middle mile broadband service to significant sections of the region, including anchor institutions, and enable GCI to partner with local ISPs to provide last mile services. Full details about Terra SW, including maps, services and pricing, are available at http://terra.gci.com.

**Exede Satellite**

Enhanced [Viasat Exede](http://www.exede.com/) Satellite broadband services\(^5\) have recently become available in a small area of the SWAMC region. Improved satellite services provide speeds and prices comparable to DSL broadband, advertised at up to 12 Mbps for $49/month, although satellite still has limitations, including latency (delay) and bandwidth caps. While there is little to be done around latency, the 10GB (and up) monthly cap is a considerable improvement and Exede does not count late night downloads. These improvements will have little impact in the SWAMC region until a better coverage area is established. Next-generation satellites launch every few years, and the best hope for this technology may rest on coverage from future spot beams. Coordinating next-generation satellite coverage will require a concerted effort by all stakeholders to identify market potential for private companies and advocacy for public investment to cover the commercial funding gap.

**Access Denied Equals Opportunity Denied**

Access to broadband will likely remain a critical factor. For some SWAMC region residents, access is an issue of availability, while for others affordability is the major concern. Some residents are unaware of the positive quality-of-life aspects that connectivity brings through better communication with family and friends, better career opportunities, better health, and better education - in other words, depicting the global information resource the internet represents. The unique combination of factors inhibiting broadband access will vary from place to place within the region; however, all communities can take action to increase access through collaboration: by sharing bandwidth, by teaching skills, or by providing public access. Increased access will drive increased adoption.

It may take a region to create access, but it takes a community to increase adoption. This is where the rubber meets the road in broadband development. Digital literacy refers to those who lack a computer and/or internet skills. Conversely, everyone has their own level of digital illiteracy based on individual capacity: an elder may lack basic computer skills; a successful business owner may lack knowledge of the digital marketplace; a doctor may not know how to enter electronic records; or a teacher may not know how best to use digital education materials. Finding ways to enhance adoption rates ensures that broadband is reaching its full potential.

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\(^4\) The total private investment by GCI in this project was $103 million dollars or $11,000 per served household. More information on this project is available at [http://terra.gci.com/](http://terra.gci.com/).

\(^5\) More information can be found at [http://www.exede.com/](http://www.exede.com/).
3. Broadband Adoption Today

*Connect Alaska*, a non-profit organization advising the State of Alaska on broadband issues, has surveyed Alaska residents about broadband use and adoption. Results represent statewide concerns and are not confined to Southwest Alaska. *Connect Alaska’s* most recent adoption survey\(^6\) indicates that 27% of Alaska residents do not have broadband. Figure 5 shows the top reasons residents choose not to go online. While access is a noted roadblock, expense and lack of interest are bigger barriers.

![Figure 5: Top Reasons Why Alaska Residents Have Not Adopted Broadband Internet According to Connect Alaska’s Most Recent Adoption Survey\(^7\)](image)

In a series of surveys in Alaska and other states, *Connected Nation*, the parent organization of *Connect Alaska*, asked non-connected businesses why they do not subscribe to the internet. Two-thirds of respondents indicated that they do not need it nor do they understand why they should subscribe. Just less than 10% indicated a lack of access (Figure 6).

![Figure 6: Reasons Why Businesses Do Not Adopt Broadband Internet Connectivity (Connect Nation)](image)

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A much smaller survey of the SWAMC region conducted online by Community Technology Advisors and completed by 24 respondents indicates that access is an issue for businesses in Southwest Alaska, but so is cost and perceived relevance. Businesses were asked to rank the roadblocks for using broadband on a scale of 1 – 5, with 5 being the greatest roadblock. The results are displayed in Table 2.

Table 2: Results of a SWAMC Region Community Technology Advisors Survey: Roadblocks to Broadband Internet Adoption in Southwest Alaska

<table>
<thead>
<tr>
<th>Factor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access in our area</td>
<td>4.4</td>
</tr>
<tr>
<td>Too expensive</td>
<td>3.9</td>
</tr>
<tr>
<td>Limited skills or comfort level</td>
<td>3.3</td>
</tr>
<tr>
<td>No computer</td>
<td>2.1</td>
</tr>
<tr>
<td>Little or no interest</td>
<td>1.4</td>
</tr>
</tbody>
</table>

The University of Alaska Anchorage’s Institute of Social and Economic Research is conducting a statistically significant survey about broadband use in Southwest Alaska, specifically the effects of Terra-SW on the Bristol Bay region. That report is in draft form and should be available in 2013. Unsurprisingly, initial findings mirror similar surveys done elsewhere. People with higher incomes and levels of education are more likely to subscribe and use the internet to do more activities (email, health care, education, banking, social media, etc.) than people with lower levels of income and education.

The Price of Broadband

In the traditional telecommunications market model, network connectivity is largely a function of population density and adoption rates. Southwest Alaska’s vast geographic region, lack of overland connectivity and sparse population drives up the unit price per person, which reinforces low adoption rates and pushes price per subscription higher. The only fiber connection in the region is in Kodiak, where a relatively large subscriber base (including private industry and government) and short distances have encouraged infrastructure development. The Bristol Bay region, with a lower subscriber base and relatively dispersed communities, deployed a fiber-microwave hybrid system, although this required an initial public investment to offset high costs. In the Aleutian region, with the most dispersed subscriber base, satellite will likely remain the only viable network connection. Satellite coverage does not come without costs, and a business model needs to sustain coverage areas. Currently, the entire region receives connectivity, although costs are higher and the legacy technology does not approach speeds delivered by new Satellite networks. ViaSat, though generally not available in Southwest Alaska, provides download speeds of 12 Mbps for $49 per month and is just one example of next-generation network potential. Table 3, below, illustrates speeds, services, and prices offered by various Southwest Alaska network providers:

[7 http://www.iser.uaa.alaska.edu/]
Table 3: Network Providers and Monthly Service Rates as of November 1, 2012.

<table>
<thead>
<tr>
<th>Provider</th>
<th>Basic Service</th>
<th>Fastest Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$49 320 Kbps</td>
<td>$109 10 Mbps</td>
</tr>
<tr>
<td>ACS</td>
<td>$50 10 Mbps</td>
<td>$130 22 Mbps</td>
</tr>
<tr>
<td>GCI</td>
<td>$24 512 Kbps</td>
<td>$165 6 Mbps</td>
</tr>
<tr>
<td>GCI - Terra SW</td>
<td>$42 512 kbps</td>
<td>$155 6 Mbps</td>
</tr>
<tr>
<td>Nushagak Coop</td>
<td>$45 256 Kbps</td>
<td></td>
</tr>
<tr>
<td>TelAlaska</td>
<td>$150 6 Mbps</td>
<td></td>
</tr>
<tr>
<td>Bristol Bay Telephone Company</td>
<td>$30 512 Kbps</td>
<td>$150 6 Mbps</td>
</tr>
<tr>
<td>Adak Eagle Enterprises</td>
<td>$75 96 Kbps</td>
<td>$200 2 Mbps</td>
</tr>
<tr>
<td>Hughes Network Systems</td>
<td>$60 1 Mbps</td>
<td>$110 1.5 Mbps</td>
</tr>
<tr>
<td>Starband</td>
<td>$65 512 Kbps</td>
<td></td>
</tr>
<tr>
<td>Viasat Excede</td>
<td>$49 12 Mbps</td>
<td>Service Not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Currently Available</td>
</tr>
</tbody>
</table>

Impact of Affordability on Connectivity Choices

Affordability and funding availability drive connectivity options in Southwest and other rural Alaskan communities. The price of a connection determines how readily residents and organizations adopt broadband. Unlike commodities where price is set in a global marketplace, broadband pricing is extremely variable depending on a community’s location and aggregate network demand. Broadband access has become both more robust and affordable in the 65 communities connected to the GCI Terra SW Project. Terra SW offers a stand-alone, 6 Mbps plan for $164.99 per month with a 25 GB bandwidth cap. An entry-level 512k plan is priced at $29.99 per month, whereas a subscription that meets the federal broadband goal of 4 Mbps costs $114.99 per month. In a somewhat unfair but revealing comparison, Google will soon offer a 1 GB (1,000 Mbps) connection in Kansas City for $70 per month.

Organizations eligible for broadband funding subsidies through USF and other federal funding sources are much more likely to have faster connections than their peers in Southwest Alaska. USF subsidies provide thousands of dollars per month per connection in savings to anchor institutions such as schools, libraries and health care providers across the region. Even with the subsidies, these organizations have relatively low bandwidth access
compared to urban areas, or even rural areas in other states. In many places, schools or health clinics in other rural localities with similar markets and client bases would have 100 Mbps or even 1 GB internet connections, while USF-funded entities in Southwest Alaska make due with 5 Mbps or even 1.5 Mbps connections.

Organizations in the SWAMC region paying retail prices for connectivity seem likely to have 1.5 Mbps or slower broadband connections. In addition, these slower connections may also have download caps that limit effective usage of the service. USF-funded organizations may not share their bandwidth with ineligible organizations even if they share a building or mission. These restrictions discourage the practice of aggregating demand, a shared service strategy for improving high-speed broadband availability by portioning connection costs among multiple users. Anchor institutions in rural communities could find this technique particularly beneficial.

**Focus Group Feedback**

Through this project, Focus Groups were formed around key sectors within the sub-regions of Kodiak, Bristol Bay and the Aleutians: health care, education, commerce & economic development, tribal & native organizations, technology and government services. This process provided feedback from Southwest Alaskan users most acquainted with network potential and shortcomings and was incorporated into the project findings. Linkages were drawn to develop policy and strategy recommendations, developed in more detail later in this document. A sampling of their conversations follow:

**John Conwell, Superintendent of Unalaska Schools**

“High Schools need to offer core classes for AK Performance Scholarships. We need to tap into online classes to get students to qualify for these scholarships. Offering college/AP courses has been difficult with our limited bandwidth. We need to get into the 21st century.”

*Policy recommendation 2* states that every Alaskan school should meet 100 Mbps of internet connectivity for each 1,000 students. As the rest of the world reaches this standard, old ways of teaching are being augmented by more effective collaborative teaching techniques capable of providing a wider range of opportunities for students and teachers.
Bristol Bay Students

Students from Bristol Bay were asked the following question: “If there was unlimited internet in your community, how would your life change?”

“I could download presentations.”

“I would do the same things – just faster.”

“I would be so happy.”

“I could work so much more quickly.”

“Weather is happening every day – we could watch that in real time.”

“I could talk to family far away.”

“I’d be able to use the memberships I bought online.”

“This telephone call would be better via videoconference.”

“I wouldn’t see sunlight for days.”

Strategy Recommendation 5 and Policy Recommendation 4 state that every Alaskan community has at least one location with a minimum high-speed internet connection of 20 Mbps. Students want information, they want to be productive, they want entertainment and they want to communicate with family and friends. And they want to connect from wherever they are, anytime of day or night. Making robust network connections available to community members will allow students and others alike to join the reality already offered to much of urban America.

Jim Jones, IT Manager, Bristol Bay campus

“We have lots of single points of failure. Better redundancy and higher bandwidth would be good. With the latency, it is hard to host a videoconference.”

Strategy Recommendation 2 argues for a regional technology council that could collaborate to improve redundancy. Once organizations possess and depend on internet connectivity, reliability becomes more important. Redundancy means having more than one internet source so if one provider goes down due to weather-impaired satellite service or a fiber cut, organizations can continue to operate.
Edgar Smith, Eastern Aleutians Tribes

“We use broadband in our clinics. We are moving towards using video in consults. We now have 5 Mbps via satellite paid for with USF funding. It is doing what it needs but it is behind our need curve.”

Strategy Recommendation 1 states the need to raise the level of concern about broadband; elevating this concern will provide signals to leadership that capacity needs to be maintained and improved. The need for bandwidth in health care is accelerating just as it is in education. Many remote health care facilities are using tele-health video consults and monitoring to bring real time specialized expertise and ongoing treatment guidance from large urban hospitals to rural hospitals, clinics and to the home. The importance of Universal Service Funds to rural Alaska cannot be overstated.

Adelheid Herrmann, Southwest Alaska Vocational Education Center

“Since our grant funding for our dedicated T1 expired, it is hard to run the school.”

Strategy Recommendations 4 and Policy Recommendation 3 strive to develop software tools and minimum computing hardware necessary to maximize value from the limited resources available. Knowing how to use technology tools is an essential skill for the workforce in Southwest Alaska. A vocational educational center focused on hands-on skills needs to be able to deliver content and resources from beyond its four walls. No matter what degree students are pursuing, a lack of computer and internet skills will hinder their competitiveness in finding jobs.

Lale Gurer, Kodiak Chamber

“We use internet with our 400 members. It’s faster, it’s easier and it’s convenient. We maintain an e-commerce site for crafters which helps get global buyers for local products.”

Strategy Recommendation 3 encourages e-business training for the business community. Chamber members, especially those engaged in serving visitors, are generally using technology to facilitate engagement. By highlighting those organizations that are making good use of broadband technology, stakeholders can promote the adoption by others who have not yet recognized the full potential of the internet.

Many organizations in Southwest Alaska are ready to make use of internet technology for education, health care and economic development. Bandwidth and affordability are significant barriers to technology adoption by residents and organizations – large and small. Ensuring public access will make a positive difference. Input from local residents indicates there is an opportunity to address the digital divide with training, both to help residents recognize the relevance of broadband to their lives but also to encourage them to set a higher value on broadband and/or recognize the potential cost savings (and earning potential) available through broadband. There is an additional opportunity to elevate the application of broadband with current users.
4. Community Approaches to Boost Access and Adoption

There is an inherent supply and demand dichotomy between broadband access and adoption. Due to costs associated with building broadband, providers are reticent to deploy infrastructure that surpasses demand. Frustrated consumers limited by supply quit going online or limit their online activity, which in turn reduces demand. On a community level, leaders want to create an environment that improves both supply and demand to increase broadband use. An increase in broadband supply – competitive, reasonably priced, with logical capacity – makes a community more attractive for business locations and new residents. Increased use of broadband can mean a more dynamic community, with better access to education, health care, entrepreneurship and entertainment. The ISP is obviously a key player in the equation. Community leaders can influence provider decisions not only through collaboration but also by focusing on increasing demand to encourage investment.

To achieve full broadband benefits rural stakeholders must have strategies in place to address the supply and demand dichotomy, organized below into the four components of community vitality: 1) Network, 2) Services, 3) Subscription and 4) Sophistication.

Community analysis should include both regional/top-down and local/bottom-up approaches. Each community needs measures for these four components to determine its broadband priorities and strategies. Each component is described below, with questions provided for a community group or technology champion. Each community will have a unique combination of answers to the questions. Network and Services generally determine access and are dependent on Internet Service Providers; Subscription and Sophistication are more community-oriented towards adoption.

![Four Components of Community Technology](image)

*Figure 7: The Four Components of Internet Community Technology*
**Network**

*Network* refers to the physical broadband infrastructure of the community. It is the actual connection to the internet. In some communities, the network has multiple components and telecommunications providers, including a national backbone company, a middle mile carrier and a last mile provider. The network could include fiber, microwave wireless, coaxial cable from the cable provider, twisted pair copper from the telephone company and/or a local wireless carrier using fixed wireless or Wi-Fi to reach the ultimate customer. In satellite dependent communities, the network is quite simple – the base station, the satellite and the dish on the house.

**Key questions:**

1. What is the middle mile capacity for our community?
2. Is it fiber optic, microwave, copper or satellite?
3. Are we connected to multiple telecommunications networks or just one?
4. What is the last mile technology?
5. Is it fiber optic, copper, satellite or terrestrial wireless?

**Services**

Lumping *Services* together with *Network* is a common misconception; they are related but separate components of Community Technology. The levels of services are determined by a combination of the end-to-end network and the decisions of the broadband provider. Examples include a telephone company that does not provide voicemail because of telephone switch capabilities, or an ISP that has a strong local fiber network dependent on satellite to deliver bandwidth. *Services* also pertain to customer service. Factors to consider include time to install new services, repair orders, help desk and affiliated services.

**Key questions:**

1. What telecommunications services are available in our community and from whom? Are they adequate to meet the needs of our community?
2. Do we have competitive services or just one provider?
3. Are they affordable?
4. Are they reliable?
5. How is the customer service?

**Subscription**

*Subscription* refers to the percentage of residents and businesses that subscribe to broadband. People buy a service when the perceived value is higher than both absolute and the relative cost. Cost of broadband is not an issue for high-income people and those who get high value from the internet, but for low-income people and those who do not receive or do not know how to obtain high value from the internet, the price can be too high. In the latter group, subscription rates increase when a defined internet value can be identified. A
community can act to increase value and demand by putting more local information and more services online, including health and education, local sports, fishing reports, community calendars and other local interests.

**Key questions:**

1. What percentage of our residents and businesses subscribe to broadband services? What does this percentage say about our community?
2. What are the characteristics of the non-subscribers?
3. Do people not subscribe because it is not available, not affordable, or because of a lack of interest?
4. Who would like to subscribe but cannot?

**Sophistication**

*Sophistication* refers to the way people use broadband, both as producers and users of information. A sophisticated community uses the internet to share information and create value through innovation. It uses broadband as a tool for problem solving, and to market itself to attract people and investment.

**Key questions:**

1. How are people using broadband in the community?
2. Are they using it to improve their access to health care or education?
3. How are local businesses using broadband and online technologies: research, marketing, purchasing, customer service, online sales?
4. How are key organizations using broadband to serve the community? Are schools and health care providers making full use of available technologies? Are they connecting to other institutions in the state or within the region? Are they connecting to people in their homes to deliver information and services?

**5. Strategy and Policy Recommendations**

It is important to understand opportunities for improved broadband access, increased broadband adoption and the important relationship between access and adoption. The following recommendations will help boost both access and adoption – although the strategy and policy recommendation are by their nature very different.

- **Strategy recommendations** are actionable items that can be implemented using the Action Plans in the following sections.

- **Policy Recommendations** are messages encouraging State and Federal policymakers to ensure Southwest Alaska gets the support it needs to improve broadband access.
**Strategy Recommendations**

**Strategy Recommendation 1:**

**Raise the level of interest and concern about broadband**

Every successful broadband development strategy starts with a local champion who raises the level of interest and concern within the community. Together, local champions can form partnerships to become a regional team. To mobilize those champions, a concerted broadband campaign must become a top priority for the SWAMC Region.

**Action Steps:**

1. Plan a conference on broadband and/or make broadband a main topic at events. Get local and national speakers to discuss the benefits of broadband adoption and access.

2. Publish articles on a consistent basis that feature case studies and stories on the impact of broadband in rural areas and/or educate readers on technical details of broadband and/or broadband policy. Articles should be published in a newsletter, blog, Facebook page and other places that allow readers to easily share information with their constituencies. By using various types of social media, stakeholders will demonstrate the value of broadband networks including traditional and mobile-friendly technologies. In addition, use of these tools can educate elected officials about key broadband policy issues.

3. Meet with State and Federal Officials to discuss key broadband topics. Be sure that elected and appointed officials understand that broadband is a priority (i.e. voting issue) for Southwest Alaska and that improved broadband access will encourage economic development and improved quality of life for residents. Use the Policy Recommendations to help policymakers understand what is needed to expand broadband.

4. Plan local or regional events to enable the broadband information campaign to reach local residents and ensure leadership hears what local residents need from broadband. Publicize stories from these events in regular articles and relay information to State & Federal Officials.

**Strategy Recommendation 2:**

**Form and support a regional technology council to develop collaborative broadband access and adoption strategies**

A regional technology council could continue momentum built by a broadband awareness campaign. Focus group sectors and members in this report could act as the technology council model. The first purpose of the council is to share information across economic sectors and across the region. This is a very practical and direct approach to improving broadband services so that more people are aware of provider plans, grant opportunities and chances to collaborate on infrastructure, bandwidth and equipment purchasing, training, technical support and other tech issues. The second purpose would be to provide ongoing input and support for SWAMC’s efforts to pursue the recommendations in this report. With limited resources and a huge geography, local and sub-regional partners will be essential to successfully moving broadband access and adoption forward in the region. Capturing opportunities created through the State Broadband Task Force plan should also be a priority.
Action Steps:

1. Identify and recruit regional technology leaders from the Focus Groups identified in Appendix C as a model.
2. Gather people together to review this plan and to select specific items as a focus. Opportunities include USF advocacy, demand aggregation, community technology centers and shared application deployment.
3. Create an online place – Facebook, LinkedIn, Google Group or other tool – as a digital gathering and sharing place for regional technology information practitioners.
4. Provide technical support in grant writing, program development and other areas to collaborate broadband efforts that emerge from the council.
5. Support local and sub-regional technology interest groups aiming to improve their respective access and adoption platforms.

Strategy Recommendation 3:

**Provide local businesses with e-business training and consulting they need to succeed in the digital marketplace**

Economic development is a key goal for broadband expansion. Improving business use of current infrastructure is a good way to see improvements, build momentum and encourage greater demand for broadband, which helps build a business case for deploying infrastructure. There are numerous options for e-business training. A project that provides training and consulting for local businesses might help reach a wider group of businesses and provide the quickest approach to increasing business use of broadband - some businesses will want to learn to develop their online presence while others will prefer to have the site built for them.

- Work with an e-business specialist to provide training and consulting
- Offer classes to local businesses, such as:
  - Planning an effective website
  - How to build and maintain a website
  - How to promote your business online
  - How to sell online
- Invite local businesses to work with consultants to build a site
- Invite local online marketers to work with e-business specialist to hone their skills; this creates local capacity

Classes can be offered locally or regionally. They may even be offered in tandem with broadband awareness meetings while building support for broadband. While expertise can come from anywhere, success is built when local planners work to promote opportunities.

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8 The National Telecommunications and Information Administration has developed a toolkit of digital literacy curricula, including some e-business options [http://www.digitalliteracy.gov/](http://www.digitalliteracy.gov/)
Action Steps:

1. Identify existing efforts and curriculum for small business technology training, including colleges, SBDCs and private sector trainers.
2. Identify gaps in schedules and offerings.
3. Identify local organizations to co-sponsor business training events – chambers, economic development groups, schools, colleges, etc.
4. Develop strategies for increasing course offerings and business participation.
5. Develop strategies for small businesses to share their successes and challenges through on-site and online forums.

Strategy Recommendation 4:

Encourage use and development of applications

Applications are activities we do on the internet, powered by computing software such as Apps on mobile devices. The more we do online, the more value one obtains from their internet connection. Applications are designed to sell products, provide services, and increase efficiency. Some applications are designed to provide information or facilitate information exchange. Applications can focus on a set geography – state, region, community, or within an industry or single company. Major tech companies offer applications over the internet; many of these we now take for granted. Google has many applications – YouTube, Maps, Docs and others. Other popular applications are Skype, Dropbox, Twitter and Pandora, and these applications have a global presence. Many organizations embed these global applications into their own online strategies so that customers can find their location and better understand their product. Other organizations develop custom applications for marketing and operations purposes. By encouraging use and development of applications, the value that organizations and industries within the region receive from broadband services will rise.

Action Steps:

1. Use the toolkit described below to educate and promote the use of applications.
2. Identify the technical talent to help organizations create and deploy their own application strategy, using a combination of existing applications like those noted above and customized applications.
3. Seek funding and regional collaboration for projects that will further application development in key sectors such as health, education, fishing, tourism and government.
Application Toolkit
The Community Technology Advisors consulting team has created an online tool to provide guidance about the range of opportunities to use online applications that enhance economic development, health care, education and quality of life. The toolkit is online at:


The toolkit includes examples of online applications grouped by community sector and bandwidth requirements. Many examples from rural Alaska are included. The toolkit can be used to introduce applications that will increase demand for services, and is intended to encourage local citizens across sectors to come up with their own uses for various applications.

Use this toolkit in the following ways:

1. Better understand the constraints that limited bandwidth presents in application deployment – for example, search only for mobile applications to see what’s possible in areas that get only mobile access.

2. Educate community leaders and broadband champions on “state of the art” application practices in the key economic sectors within their communities so that they can advocate with possibly reluctant stakeholders.

3. Identify applications that would have high value for a community, and then work in partnership with target organizations to build community and financial support for application deployment.

4. Collaborate with partners to promote shared application development.

The following applications are found in the toolkit and included here as examples. Regional leaders may consider emulating or promoting these applications within their communities. Many more applications are available, and the offerings are expanding every day.

Business Applications
Mobile checkout for retailers - using wireless technologies, vendors are able to accept credit card transactions using their mobile telephones:

http://swakbroadband.com/toolkit/?p=259

Mobile phones can also be used to transfer money (useful in villages with no banks) or conduct local surveys of visitors, customers or local residents:

http://swakbroadband.com/toolkit/?p=252
Sensors can be used for shipping or fishing logistics to keep track of inventory, temperature and other considerations:


**Health Applications**

PatientView is an electronic medical record application that runs on standard cell phones, especially good for health workers working in village clinics and in local homes

http://swakbroadband.com/toolkit/?p=245

**Government Applications**

Make sure that all of your local government information is current and accurate with Alaska’s 511-telephone application.

http://swakbroadband.com/toolkit/?p=305

In addition, we have created a presentation using Prezi to give online viewers quick context about how available bandwidth enables different types of applications. That presentation is also available at:


**Strategy Recommendation 5:**

**Support at least one location in each community where residents will have access to high speed internet connection of at least 20 Mbps**

Increasingly, applications for business, education, government and entertainment are designed to make use of more robust broadband networks. A modern-day economy, able to support and attract businesses and residents, needs public access to high-speed internet at a minimum. This is not a luxury but a necessity to interact in the global community. Widely available Community Centers are viable facilities to enhance and house broadband connectivity; however, these institutions likely use USF funding, with associated restrictions that create barriers for more dynamic public use. **Policy recommendation 1,** focusing on flexible use of USF funded facilities will need to be addressed before public use Anchor Institutions can become valuable Community Information Centers. While many public funds will come with USF restrictions - for the time being - a multi-purpose facility funded through a public-private partnership (3P) is another option. Federal and State grants not tied to USF could be leveraged against private resources, and local telecommunications providers could be valuable partners, as they have incentives to provide more and better service customers.
Action steps:

At the regional level

1. Pursue Policy Recommendation 1 to allow flexibility with USF funded Anchor Institutions.
2. Contact telecommunications providers to understand availability and cost of the bandwidth requirements needed by these centers.
3. Explore funding possibilities through public-private partnerships.
4. Communicate this strategy to key local, regional, state and national stakeholders.

At the community level

1. Identify stakeholder groups interested in such a facility.
2. Identify existing and potential sites to house a community technology center.
3. Develop capital and operating budgets.
4. Identify and pursue funding through permanent legislative funding or grant programs.

Policy Recommendations

Investment will be a requirement for increased broadband access. Due to the remote nature of many parts of Southwest Alaska it is likely that ubiquitous and improved broadband will not happen without government subsidies and a significant coordinated effort among users. Before the SWAMC region can pursue efforts to influence national and state leaders on the importance of broadband, they need to believe that broadband is a critical issue to the region, thus the importance of a strong effort to implement Strategy Recommendation 1: Raising interest and concern with local leadership. The following talking points frame the importance of broadband enhancements in Southwest Alaska and encourage State and Federal investment by pursuing the following Policy Recommendations:

Policy Recommendation 1:

Universal Service Fund (USF) regulations should be flexible so that in remote communities, USF-funded broadband may be more widely accessed and shared more broadly.

a) Organizations and residents of Southwest Alaska generally face extraordinary costs to deploy and subscribe to broadband services.

b) Current USF rules discourage sharing of these high-priced services to the detriment of Southwest Alaska communities.

c) Existing USF rules are built on the assumption that other organizations will purchase their own services since they cannot share USF funded services. In many parts of Southwest Alaska, broadband pricing excludes many organizations from even minimal bandwidth purchases. In other words, there is no substitution, just fewer broadband services used.
Policy Recommendation 2:

The State of Alaska should ensure that every school meets the “100 Mbps per 1,000 students or 10 Mbps per 100 students” standard set by school technology experts.9

a) When schools and students are denied adequate internet access, there is an effective denial of equal opportunity. All Alaska children deserve equal educational access.

b) Educational institutions are evolving into more collaborative learning environments, and these new tools will require high-speed networks to be effective.

c) Students around the globe are using broadband to network, take classes, find content and expand resources; limited access means that students are at a competitive disadvantage.

Policy Recommendation 3:

Every Alaska student should have access to an internet-enabled device and broadband connectivity.

a) Connectivity allows students to use the internet and foster their education, and lacking computer hardware as well as home connectivity eliminates access.

b) Students unfamiliar with basic hardware devices necessary to access the internet and work in a Knowledge Society are at a competitive disadvantage.

c) Communities may lack public internet access that meet residents’, especially students’, needs; a flexible society requires that students have tools to access the World Wide Web.

Policy Recommendation 4:

Every Alaska community should have at least one location where community members can access a high-speed internet connection of at least 20 Mbps; this could be a school, library or other community center.

a) Vibrant communities need high-speed internet access for the purpose of enhanced e-commerce, health, education and community vitality.

b) The costs of providing a community technology center with high speed internet service is beyond the means of most rural communities, absent public investment.

c) These centers would support many state initiatives as state agencies seek to use technology to deliver high quality, low-cost services.

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9 The State Educational Technology Directors Association recommends that by 2014, schools have external Internet connections equal to 100 Mbps for every 1,000 students or 10 Mbps for every 100 students. Internal school networks should be 10 times faster capacity or 1 Mbps per student. [http://tinyurl.com/6mwmw22](http://tinyurl.com/6mwmw22)
6. Closing Discussion

This project focuses on Southwest Alaska, but is really meant to be a strategic roadmap for all of Rural Alaska to maximize competitiveness and quality of life. Geographic, topographic, and demographic circumstances will most likely ensure that rural Alaska pays a premium for high-speed internet. Strategically approaching access and adoption from an organized and regional framework is necessary for effective utilization of broadband networks.

Maintaining access to quality networks, applications, and hardware for every resident needs to be a priority goal, and a necessity for students. Anchor institutions with reliable service, made possible through public investment, must be available to all residents. If publicly funded facilities are to have value, they must be flexible enough to provide digital services and training that will be important for containing costs and creating a vibrant community. Current USF laws do not serve the unique broadband needs of rural Alaska, and could use reform in order to fulfill their maximum potential.

Adoption will develop as access to quality networks becomes widespread and users of the network continue to understand its perceived value; this requires the right combination of hardware and software applications. Critical mass has developed throughout the World Wide Web where applications seamlessly permeate modern society. More sophisticated applications with tangible benefits may need to be developed in order for rural Alaskans to pay the high price of access. Through training, collaboration and especially education, rural Alaskans will incorporate useful applications that enhance economic activity and their quality of life. A next-generation economy is developing in rural Alaska, and that requires successful access and adoption of high-speed internet technologies and applications.
Appendix A

Case Study: Minnesota Intelligent Rural Communities (MIRC) - Improving Broadband Adoption

The following case study illustrates a situation where, like SWAMC, rural communities in Minnesota recognized that they needed better broadband and were motivated by a desire to do more to support infrastructure development through increased adoption. The Minnesota Intelligent Rural Communities\(^\text{10}\) (MIRC) Team provided structure, leadership and support to the community. The definition of community in this program was flexible; communities included towns, counties, a five-county development region and a tribal government; each was unique but united through their membership in MIRC.

The MIRC team identified and used an economic development strategy that led to better broadband and more vital communities: The Intelligent Community Approach (http://www.intelligentcommunity.org/). The MIRC project was funded through a federal stimulus grant from the US Department of Commerce, NTIA Sustainable Broadband Adoption program. The grant funded the development of training resources for digital literacy and small business as well as funds for 11 rural Minnesota communities. Each community received $100,000 and worked with a community coach to implement the Intelligent Community approach shown below. The Intelligent Community approach promotes using broadband infrastructure and services as a platform to create, attract and support a knowledge workforce, spur innovative use of technology throughout the community and address digital inclusion. Developing these assets helps market communities to the outside world to attract talent and investment.

Each community worked with their coach through a benchmarking and planning process to understand their current situation and to set strategies for improving their use of broadband. Through a community Request for Proposal process, local organizations submitted proposals for projects. Communities selected and implemented an average of eight projects for implementation over a two-year period. Individual projects ranged $1,000 - $50,000 in grant funding.

\(^{10}\) The Minnesota Intelligent Rural Community (MIRC) program is a federally funded Broadband Technology Opportunity Program project.
The following represents a sampling of projects implemented through the MIRC project categorized by the five components of Intelligent Community. A table with all of the MIRC projects can be found on the Blandin Foundation’s Community Broadband Program webpage, at:


**Broadband Access**

1. The City partners with local independent broadband provider to install multiple outdoor wireless hotspots at key attractions, including parks, campgrounds, and downtown. Result: Increased tourism, improved quality of life as residents can access internet via mobile devices.

2. A county supports wireless networks at public libraries, at assisted living facilities and in partnership with private businesses, creating at least 13 new public access points. Result: Job seekers have better access to computers to find and apply for employment.

3. Multiple school districts open their networks to student devices like laptops, tablets and phones as well as general community access. Result: Neighbors, including some entrepreneurs, are able to access better broadband to accomplish more online.

Connection to SWAMC: There was no inherently right way to promote better broadband access. Each community assessed their needs and assets to develop the custom solution to meet their needs. Similarly, communities in Southwest Alaska could expand access to broadband through open wireless hotspots.

**Knowledge Workforce**

1. The Leech Lake Band of Ojibwe requires that each member seeking to participate in the Temporary Employment Program first complete a digital literacy-training curriculum. Result: Several hundred tribal members have been trained at one of four public computer labs assisted by tribal college students tutors.

2. In Winona, the Workforce Center purchased a mobile laptop lab to bring to local businesses for computer assessment and training. Results: Local businesses receive training and improve their use of the internet as a marketing tool; some see improvement in business due to online activity.

3. Adult Basic Education teachers in each of the 11 communities have been teaching digital literacy programs in partnership with the Workforce Centers. Result: Job seekers improve employable skills.

Connection to SWAMC: Many Southwest Alaska residents, especially in villages, spoke about broadband being prohibitively expensive while others said they simply did not have skills required to be effective online; opening public access spaces and increasing training would meet both sets of needs. Similarly, communities in Southwest Alaska could expand the Knowledge Base by providing training, and incentives to do so.
Innovation

1. In several communities seniors have been able to stay in their homes using digital monitoring and communication technologies. Grandparents stay connected to kids. Elderly patients are remotely monitored for health issues. Sandwich generations – looking after both old and young – can check in on aging parents remotely while staying home with their own kids. Result: People stay in their homes longer, increasing quality of life for them and reducing costs for patent and healthcare facilities.

2. A rural county makes all Geographic Information Systems (GIS) mapping and property records available online. Result: Saves staff time and enables remote access from customers who may be some distance away.

3. A county promotes the use of digital video technologies for live streaming and archiving of community events, including county board meetings, sporting events, festivals, etc. leading to a local YouTube video channel. Result: Videos have been a great marketing tool, connecting more potential visitors to the area.

Connection to SWAMC: Better access to healthcare and information has been a key to improving quality of life, especially in remote areas. Online access to health care removes distance as a barrier to good health. Similarly, communities in Southwest Alaska could incorporate innovative means of replacing physical activities with digital services, saving time and increasing opportunities.

Digital Inclusion

1. In partnership with PC’s for People, a Minnesota non-profit, more than 1,000 computers have been refurbished and distributed to low-income families through school districts, Head Start programs and workforce programs. Many of the local communities have arranged discounted broadband services through partnerships with Internet Service Providers. Result: More children and families have a computer at home to help with homework and to communicate with school (via student portals).

2. A local bank partnered with the Elder Circle program to offer digital literacy training focused on online banking. Result: The bank can provide more services to clientele online, which is both easier for the client and more efficient for the bank.

Connection to SWAMC: Especially in colder climates, travel can become more difficult and life more isolated for the elderly; increasing digital connections from home would increase their quality of life. Local social service providers and commercial establishments can develop strategies to connect to elderly and lower-income families in their homes. Similarly, communities in Southwest Alaska could expand adoption through programs that facilitate access to devices and a network connection.
Marketing

1. After learning that more than 25% of all web site visitors are now connecting via mobile devices, a local Convention and Visitors Bureau has converted all of their tourism web sites to be mobile device friendly. Result: The improved websites are reaching more tourists.

2. In Benton County, broadband service availability and wireless hot spot directories have been printed and placed online. Result: More local citizens (as well as visitors) are able to get online.

3. Through the University of Minnesota Extension Service, thousands of small businesses have claimed and verified their Google map locations and multiple communities are using Google Mapmaker to map community assets and attractions. Result: Local businesses are attracting more visitors.

4. In Thief River Falls, community members attended a technology fair that provided information and training around broadband services and the use of broadband. Result: Local residents are more informed about how they can use broadband in their daily lives and recognize the value that their broadband subscription provides.

Connection to SWAMC: Marketing should be targeted to both external and internal audiences. Focusing on external audiences brings new customers, more visitors and increased local business vitality. Advocating for broadband use among community members increases their receptiveness to local products and services delivered online, and increases local residents' access to information. Similarly, communities in Southwest Alaska could market digital applications to enable local institutions to be more efficient and effective in delivering services.

Applications Conclusion

A key to the success of the MIRC Project is that each community developed their own set of priorities and sought proposals from interested and willing community partners. Once project ideas were identified, MIRC steering team leaders facilitated collaboration among those projects with shared elements. Community leaders in Southwest Alaska can set a goal to increase the technological sophistication of the region, as can leaders in individual communities. Determining the priorities, the correct partners and scale, funding sources, best vendor and appropriate use policies requires local discussions, planning and implementation.
Appendix B

Case Study: Partnering with Anchor Institution to Aggregate Demand - US Cable & East Central Minnesota Educational Cable Cooperative

This case study looks at complimentary needs of two organizations, which enabled the deployment of a regional fiber network and provides a platform for continued broadband deployment. The East Central Minnesota Educational Cable Cooperative (ECMECC) is a consortium of 13 school districts and a Technical College in East Central Minnesota. The cooperative was seeking to expand its use of interactive television and to meet its needs for high speed internet. At the same time that ECMECC was seeking to upgrade its network, US Cable needed to improve its network in order to provide high speed internet, digital and HD television and telephone services to its customers. The investment required by US Cable was large and the dynamic nature of the telecommunications business added risk to the small company’s considerations.

With significant overlap in territory and a shared interest and need for a high bandwidth network, the two organizations were able to develop a mutually beneficial arrangement that provided the services that ECMECC and its member districts required and enabled US Cable to obtain an Anchor Tenant for their network, reducing risk to an acceptable level.

Results

In January 2006 a new fiber optic based gigabit network was put into place. The ECMECC membership grew to its present level and a whole new era of programming began to unfold. ECMECC continues to offer two-way interactive classes within membership schools using video conferencing. ECMECC is connected to the statewide network, offering and receiving courses, and attending virtual field trips using video technology. A high capacity network backbone allows sharing of data applications and allows ECMECC members a high bandwidth outlet to Internet II applications\(^\text{11}\) and the commodity internet.

The citizens in the region now have competitive broadband and higher bandwidth services, with the telephone incumbent providing DSL and voice services and US Cable providing voice, video and data services. With its advanced network, US Cable can now offer a larger selection of services across the region. With a wealth of fiber connecting the region, US Cable was able to expand from providing only local services to a delivering middle mile services throughout the region and beyond. Organizations needing large bandwidth services, such as hospitals, governments and data-driven businesses have access to these services, either for the first time or in a newly competitive marketplace. The regional nature of the local economy means that many organizations have offices in many of the same cities as this regional network, thus allowing them to operate advanced networks across the region.

\(^{11}\) [http://en.wikipedia.org/wiki/Web_2.0](http://en.wikipedia.org/wiki/Web_2.0)
# Appendix C: Focus Group Matrix

<table>
<thead>
<tr>
<th>Focus Group Members</th>
<th>Bristol Bay Area</th>
<th>Aleutians Area</th>
<th>Kodiak Area</th>
<th>out of region reps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Representative - clinical</td>
<td>BB Health Corp.</td>
<td>Iliuliuk Family &amp; Health Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Representative - IT</td>
<td>Dillingham Public Health</td>
<td>Eastern Aleutian Tribes</td>
<td></td>
<td>Primary Care Association</td>
</tr>
<tr>
<td>K12 School Representative - Educator</td>
<td></td>
<td></td>
<td>KIBSD</td>
<td></td>
</tr>
<tr>
<td>K12 School Representative - IT</td>
<td>Dillingham Superintendent</td>
<td>Unalaska Superintendent &amp; Library</td>
<td>KIBSD IT Director</td>
<td></td>
</tr>
<tr>
<td>Higher Ed - Educator</td>
<td>Bristol Bay Campus IT &amp; BB Campus Director</td>
<td>SW AK Voc Ed Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Ed - IT</td>
<td></td>
<td></td>
<td>Kodiak College Director</td>
<td></td>
</tr>
<tr>
<td>Chamber of Commerce</td>
<td></td>
<td></td>
<td>Kodiak Chamber</td>
<td></td>
</tr>
<tr>
<td>Economic Development</td>
<td>SAVEC</td>
<td>Trident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native Corporation / Entities</td>
<td>BBNC &amp; BBNA</td>
<td>APIA Technology Officer</td>
<td>Koniag Inc.</td>
<td>Small Business tech trainer</td>
</tr>
<tr>
<td>Tech-oriented Business</td>
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</tr>
<tr>
<td>Focus Group Members</td>
<td>Bristol Bay Area</td>
<td>Aleutians Area</td>
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<td>out of region reps</td>
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</tr>
<tr>
<td>Internet Service Provider</td>
<td>Nushagak Cooperative</td>
<td></td>
<td></td>
<td>GCI, Terra SW</td>
</tr>
<tr>
<td>Local government official</td>
<td>Dillingham Mayor and BBEDC</td>
<td>Unalaska City Planner &amp; City of Adak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tribal government official</td>
<td>BBNA</td>
<td>APIA</td>
<td>KANA</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>University of Alaska Workforce Programs &amp; Former BB resident</td>
<td>Unalaska City Council</td>
<td></td>
<td>ISER</td>
</tr>
<tr>
<td></td>
<td>Bristol Bay School Kids</td>
<td>AEB</td>
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<td>Connect AK</td>
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<td></td>
<td>Safe and Free Dillingham</td>
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<td></td>
<td>WACDA</td>
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<td></td>
<td>BBNA</td>
<td></td>
<td></td>
<td>Intelligent Energy Systems</td>
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