

ARRA and Broadband in Alaska  
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September 2009

### Broadband Background

Broadband for all Alaskans remains an elusive target. The United States lags behind many other nations in low cost broadband to the home. In Alaska there remains a sharp divide between urban and rural access. Alaska's cities have concentrations of high speed networks that make the state look well connected on a per capita basis. But in many areas of rural Alaska even basic, slow internet service is intermittent at best and there even remains spotty coverage on the outskirts of the cities.

Just as the age of the automobile demanded the building of modern multilane highway systems and the age of the plane demanded the building of a modern air transportation system, so the age of information demands the building of end to end high capacity networks. Not doing so in Alaska increasingly cuts off access to basic services. Not doing so stalls economic growth for the state. This is as much a challenge for the University of Alaska as it is for other sectors of Alaskan business, government, health, safety, tourism, all aspects of life. Bit by bit, literally, UA is making progress, working with natural allies in education and research but also with government and the private sector, to eradicate the barriers to broadband for all Alaskans. Not doing so means the university falters in its mission to provide access to higher education to all Alaskans.

Broadband is a national issue. It transcends administrations, political divisions, and challenges all Americans. The FCC has been tasked with developing a national broadband plan. Educause, the national higher education IT organization, estimates that in the not too distant future the average American household will need upwards of 100 megabits of bandwidth. That is a factor of nearly 100 of what many Americans have today. There remain sections of the country including large areas of Alaska, where even one megabit is not possible. Where high speeds are available, the price can be prohibitive.

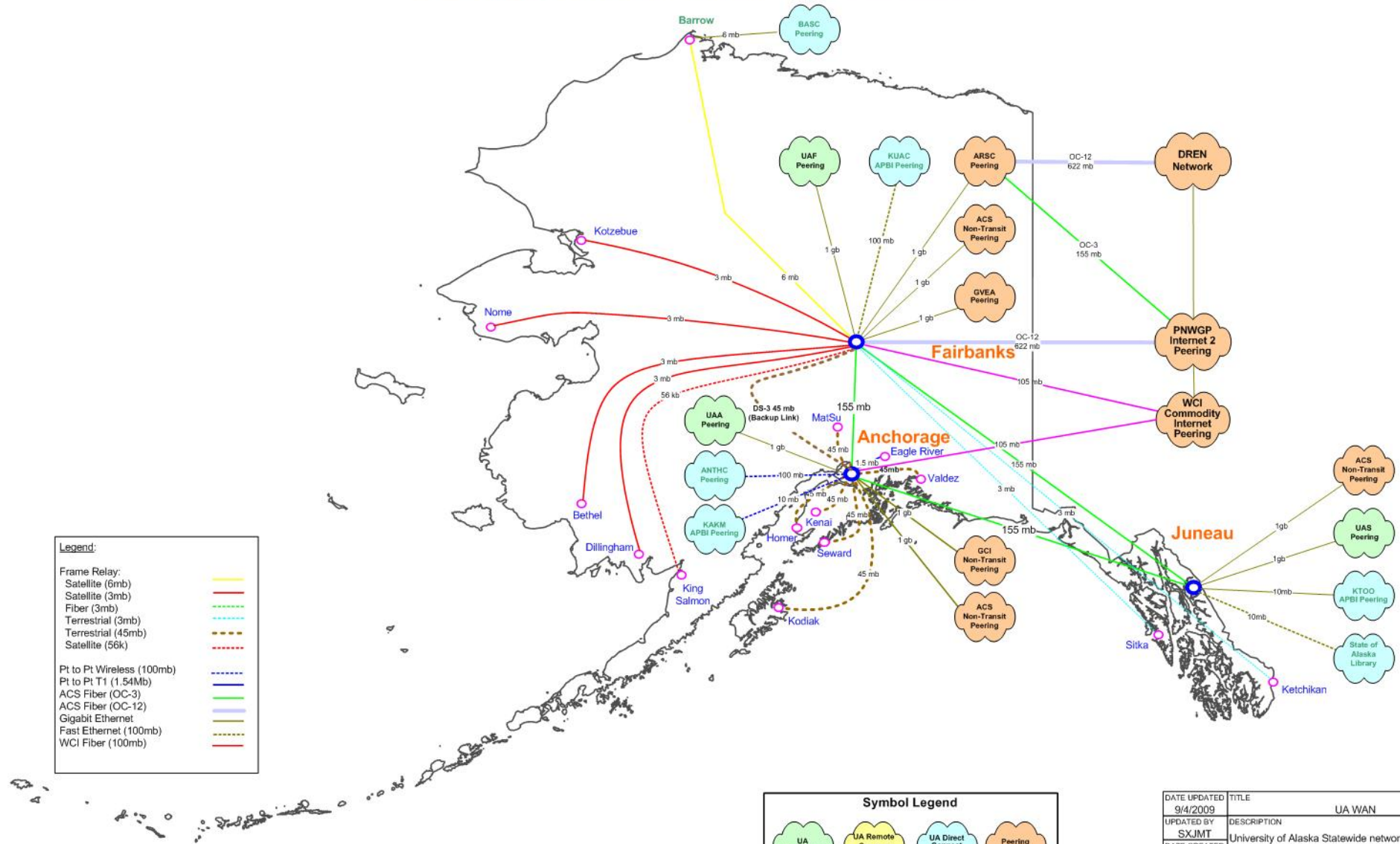
The nation, including Alaska, is not idle in solving this problem of broadband distribution. Carriers in the lower 48 states are deploying fiber optic cable to the curbside. Ketchikan is the first community in Alaska working on the same sort of fiber distribution. The danger in our state is that the unequal build out of capacity threatens to turn the digital divide into the digital abyss. While the homes of Ketchikan may soon have an optical fiber to their doorstep, there are places in rural Alaska where the entire community has far, far less bandwidth than a single fiber connected house.

There is hope. Alaska's carriers, small and large, continue to find innovative ways to increase bandwidth, expand coverage, and lower cost. The university is aggressively working with carriers to significantly increase bandwidth to its campuses. At the same time UA has been working with others – in health care, in libraries, in government, in research, in education, to increase high speed connections for all Alaskans. Nationally, the American Recovery and Reinvestment Act (ARRA) set aside over \$7 billion to investment in broadband.

As the following map indicates, the University of Alaska has an extensive and complex network with intrastate and interstate connections. UA's connection outside Alaska has been substantially improved in the past year through the bandwidth gift from GCI for research and education. The biggest challenge in Alaska is that western and northern regions are principally served by satellite, a choke point for true broadband services. The university is revising its strategic plan for the system network, taking into account the GCI gift and changes in the technology. This plan will be used to write requests for proposals in 2010 when all the current system contracts for telecommunications expire.

# University Of Alaska

## Main Campus, Remote Campus, and Direct Connect Sites



**Legend:**

Frame Relay:	Yellow line
Satellite (6mb)	Red line
Satellite (3mb)	Red line
Fiber (3mb)	Green line
Terrestrial (3mb)	Cyan line
Terrestrial (45mb)	Orange line
Satellite (56k)	Dashed red line
Pt to Pt Wireless (100mb)	Dashed blue line
Pt to Pt T1 (1.54Mb)	Dashed blue line
ACS Fiber (OC-3)	Blue line
ACS Fiber (OC-12)	Blue line
Gigabit Ethernet	Green line
Fast Ethernet (100mb)	Orange line
WCI Fiber (100mb)	Red line

**Symbol Legend**

UA MAU Sites	UA Remote Campus Sites	UA Direct Connect Sites	Peering Points
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DATE UPDATED	TITLE
9/4/2009	UA WAN
UPDATED BY	DESCRIPTION
SXJMT	University of Alaska Statewide networkSite Map showing the University of Alaska Network locations and peering points.
DATE CREATED	
10/2/2007	
DRAWN BY	
SXERV	MAU and Remote Campuses

FULL FILENAME Y:\COMPLETED\5 YEAR NETWORK PLAN\UA WAN MAP.VSD

### Purpose of broadband stimulus funding

The ARRA broadband stimulus programs cover four areas funded through the Rural Utilities Service (RUS) of the Department of Agriculture and the National Telecommunications Infrastructure Administration (NTIA) of the Department of Commerce. Altogether \$7.2 billion of stimulus funding for broadband is available. Proposal guidelines require a 20% match.

The four programs include:

- broadband infrastructure that will go primarily to carriers through both RUS loan, loan guarantee and grant programs and through NTIA grant programs;
- broadband mapping and planning grants through NTIA to a single designated state entity;
- public computing center grants through the NTIA; and
- promoting sustainable adoption of broadband grants through NTIA.

The bulk of the funds will be for infrastructure projects. Unlike some stimulus funding that is funneled through various agencies of state government, the broadband funding is through a competitive grant process with three rounds of funding anticipated. The response to these broadband opportunities nationally has been intense. Preliminary indicators are that the amounts requested exceed the funds available by a factor of 7 to 1.

### University activities for broadband stimulus programs

When the ARRA broadband programs were announced the university moved immediately to act as the clearing house for information in the state. In cooperation with the Institute of the North, the State of Alaska and the Denali Commission, the university held four statewide briefings on the programs moderated by telecommunications expert Dr. Alex Hills. These were open to the public and each audio conference briefing had 50-60 participants. There was also a face to face meeting hosted at the UAA Anchorage campus. It was anticipated competition for the public computer center and sustainable adoption of broadband programs would be intense. NTIA indicated there was the possibility of only one grant being awarded to each state. UA coordinated a proposal for both programs that included participation from multiple agencies around the state to increase Alaska's chance for these funds.

The university supported all proposals from carriers and consortia for the infrastructure stimulus broadband grants and wrote letters of support if requested. The final list of proposers has not yet been made public but there are at least six Alaskan infrastructure proposals from enhanced satellite delivery to an undersea fiber optic cable to go from Kodiak to Prudhoe Bay.

UA has worked closely with the State of Alaska to bring focus and collaboration to the efforts to build out broadband infrastructure in the state. There has been regular contact and communication with interested legislators, the governor's office, the State of Alaska Washington DC office, and the Alaska Departments of Education, Administration, and Commerce, Community and Economic Development. In a meeting facilitated by the State of Alaska DC office, representatives from the Department of Commerce, Community and Economic Development and the University of Alaska met with the NTIA Chief of Staff to present Alaska's situation and need for broadband infrastructure.

The Denali Commission was designated by the State of Alaska as the agency to submit a proposal to map broadband coverage in the state. Each state will receive one of these grants. The university has worked with the commission throughout their proposal process. This grant also includes broadband planning

funds. The commission has indicated that the university will be included as a primary participant as that planning process goes forward.

Research for broadband in the state has not been neglected by the university. The Denali Commission proposal for mapping and planning includes an initial study by UAA's Institute of Social and Economic Research on barriers to broadband adoption in the state. UAF's College of Engineering and Mines was just awarded a grant by the National Science Foundation to research the feasibility of laying fiber optic cable directly on the tundra without the normal expense and environmental disruption of trenching and installing conduit to lay the cable. A partner in this project is GCI. If the research proves this a reasonable option, it will greatly reduce the cost of laying fiber optic cable to hub communities such as Bethel, finally breaking the bandwidth limiter of satellite only connections.

Following are project abstracts for the recently funded Cable on the Tundra project and three of the ARRA broadband proposals.

National Science Foundation: Early-concept Grant for Exploratory Research (EAGER)  
Project Abstract: Cable on the Tundra  
University of Alaska Fairbanks

The University of Alaska Fairbanks (UAF) has begun a research project to test the viability of laying fiber optic cable across the arctic tundra to extend broadband network capacity to regions now only accessible by satellite. UAF is undertaking this research in a public-private partnership with General Communication Inc. (GCI), an Alaska carrier with extensive experience in rural arctic telecommunications. The fundamental research question is this: can the cable be laid across the landscape – tundra, hills, streams – and provide reliable broadband to remote arctic regions?

If such fiber optic cable deployment is feasible, many options open up for extensible broadband network topologies in the arctic. For UAF, this extends research and education possibilities. It expands the opportunities for research without boundaries. It also increases broadband applications for many other uses. The results will have applicability for telecommunications across the polar regions of the world.

The National Science Foundation has awarded UAF \$200,000 to explore this research at its Toolik Lake research station. GCI is providing the test cable and access to its existing fiber optic system so that actual data can traverse the test segments. This project is in its early stages; the plan is to have test cables in place for the winter season of 2009-2010. The principle investigator is Dr. Rorik Peterson in the Department of Mechanical Engineering at UAF.

Department of Commerce: National Telecommunications and Information Administration  
Broadband Technology Opportunities Program (BTOP)  
Project Abstract: Enhancing Rural Alaska's Community Computing Centers  
University of Alaska

This project will expand public access to broadband services and enhance broadband capacity at community colleges, public libraries, rural health and tribal government facilities that permit public use of computing resources. The proposal provides employment from construction and renovation of facilities, and staffing of local public computing centers. The goal is to create community public computing centers (PCCs) with the farthest reaching impact. A regional approach was taken - where partnerships and impact are strong and where projects are near shovel ready and can be carried out in the mandated time frame.

This project supports the following BTOP Statutory Purposes:

- Provide improved access to broadband services to consumers residing in underserved areas of the country;
- Provide broadband education, awareness, training, access, equipment, and support to community anchor institutions, or organizations and agencies serving vulnerable populations or job-creating strategic facilities located in state or federally designated economic development areas;
- Stimulate demand for broadband, economic growth and job creation.

This project includes community learning center expansions at Chukchi Campus, Northwest Campus, and Kachemak Bay Campus. Partners include Ilisagvik Tribal College, Maniilaq Association, Buckland IRA, and Chickaloon Tribal Council, Anchorage Public Libraries, Alaska State Library and Nome Public Library. Overall, 28 PCCs will be created - reaching 45% of the state population. The project will provide residents of economically distressed communities with access to information technology and related training that improves academic and vocational achievement, as well as individual physical and social well-being.

This proposal is closely tied to the Bridging the e-Skills Gap application, also submitted by the university. This project was pared down from over \$40M in project requests by interested partners. The total request is \$21,683,659 and \$6,947,700 in match. The UA portions are approved projects that lacked full funding and met ARRA criteria. They were coordinated through the UA system and respective campus facilities offices.

All partner organizations agreed to assume ongoing operational costs of their respective computing centers. University facilities expanded in this project will become the responsibility of the receiving campus. The following is a list of the project partners:

Northwest Community Campus  
Kachemak Bay Community Campus  
Chukchi Community Campus  
Ilisagvik Tribal College  
Maniilaq Association  
Buckland Tribal Council  
Mat-su Community Based Computing Center  
Chickaloon Tribal Council  
Alaska State Library  
Municipality of Anchorage Public Libraries

Department of Commerce: National Telecommunications and Information Administration  
Broadband Technology Opportunities Program (BTOP)  
Project Abstract: Bridging the e-Skills Gap in Alaska  
Alaska Distance Education Consortium (coordinated through the University of Alaska)

This project has four primary goals, consistent with the BTOP statutory purpose of promoting sustainable broadband adoption:

- To create a cadre of local rural residents with information technology software and hardware skills of use to new broadband users in the community, and with employability value to training participants.
- To encourage technology use among underserved audiences across Alaska with a broadband awareness program using print, radio and electronic media that includes a wide spectrum of topics to encourage broadband use, and through an innovative computer device loan program.
- To offer broadband technology audits (similar to energy audits), based on best practices in design, to project partners along with resources and assistance for any partner-desired revisions to garner increased use by target audiences.
- To create a statewide Multi-Sector Digital Inclusion Council as a forum for the discussion and sharing of best practices and the elimination of redundancy through sharing of partner-developed content.

The 21 partner institutions, agencies and businesses expect the project to reach across Alaska, providing training to over 84,000 Alaskans including school-age children, professional adults, unemployed adults, and senior citizens.

This project includes innovative strategies for reaching Alaska's diverse and dispersed residents. Video conferencing technology, live electronic discussions, and web archiving of content for asynchronous retrieval will all be used. Much of the training is local job capacity building – village IT support, TeleHealth coordinators, continuing education for educators and other professionals, and work skill readiness as a tool for addressing unemployment and poverty. Nearly 1/3 of the project budget represents training costs with an average cost for broadband awareness or broadband-assisted training of just \$51/person. This is a phenomenal demonstration of the value of broadband for precipitating change in Alaska. Currently, most training tops \$1,000 per person for travel alone.

There are no ongoing costs of maintaining the program to the university. The AKDEC project is self-sustaining or will cease to exist. This BTOP project brings indirect costs to the university as project coordinator. The total request is \$4,525,936 with \$2,293,374 in match. The following is a list of the project partners:

Alaska Pacific University  
Alaska Rural Telehealth Consortium  
Alaska Native Tribal Health Consortium  
Alaska Vocational Technical Education Center  
KACN-TV  
Ilisagvik College  
Department of Education and Early Childhood  
Alaska Injury Prevention Center  
UA Ak20 Network Expansion  
Alaska Digital Storytelling  
Alaska Library Network  
Alaska Family Centered Services

Department of Commerce: National Telecommunications and Information Administration  
Broadband Technology Opportunities Program (BTOP)  
Project Abstract: Broadband Mapping  
Denali Commission

Alaska Governor Sean Parnell designated the Denali Commission (Commission) as the single entity to apply for funding under the Notice of Funds Availability issued by the National Telecommunications and Information Administration (“NTIA”) of the United States Department of Commerce, RIN 0660-ZA29, Catalog of Federal Domestic Assistance Number 11.558.

The Governor and State of Alaska recognize the unique nature of the Commission and its successful track record in addressing similar challenges, and therefore, has designated the Commission to lead this important effort to map and plan broadband in Alaska. The Governor’s designee, Ms. Karen Rehfeld, Director of Alaska Office of Management and Budget is the Commission’s State Co-Chair. The State intends to be an active participant and major partner in this proposed mapping and planning effort with direct involvement by the State Co-Chair, Governor and appropriate state agencies and state personnel. In addition, the Commission will employ the services of broadband mapping leader, Connected Nation, to implement the Connect Alaska program.

This application, submitted on behalf of the state of Alaska, seeks to employ industry-standard GIS toolsets and experienced personnel to deliver comprehensive and accurate broadband mapping data, develop state-level broadband maps, aid in the development and maintenance of a national broadband map, and fund statewide initiatives directed at broadband planning.

The Connect Alaska suite of deliverables will include datasets as required by the NTIA as well as web-based, interactive broadband maps to inform state and local government officials, consumers, broadband providers, community development organizations, researchers, and other stakeholders. This interactive website will be critical to ensure accessibility of the broadband data, but it will also be key to increasing awareness of the mapping program and the benefit of broadband. It will also play an important role in ensuring local verification of the mapping data.

In compliance with the Notice of Funds Availability (NOFA), Connect Alaska will facilitate the mapping project under the strictest of secure protocols for data collection and analysis. In particular, Connect Alaska will be carrying out this mission in the most secure and confidential manner to maintain full compliance with the confidentiality standards called for in the NOFA.

The scope of this project will span five (5) years and in accordance with the following timeline:

- |                   |   |
|-------------------|---|
| November 1, 2009  | Delivery of preliminary data, as available at that time.            |
| February 1, 2010  | Delivery of a substantially complete set of broadband mapping data. |
| March 1, 2010     | Delivery of a complete set of all broadband mapping data.           |
| September 1, 2010 | Commence with Semi-Annual updates through 2014.                     |

The state of Alaska and Connect Alaska will continue to work closely to ensure a tightly integrated state strategy for effective grant program implementation.