Institute of Social and Economic Research

UNIVERSITY of ALASKA ANCHORAGE

Rural Broadband: Opportunities for Alaska

Heather E. Hudson

Professor and Director
Institute of Social and Economic Research (ISER)
University of Alaska Anchorage

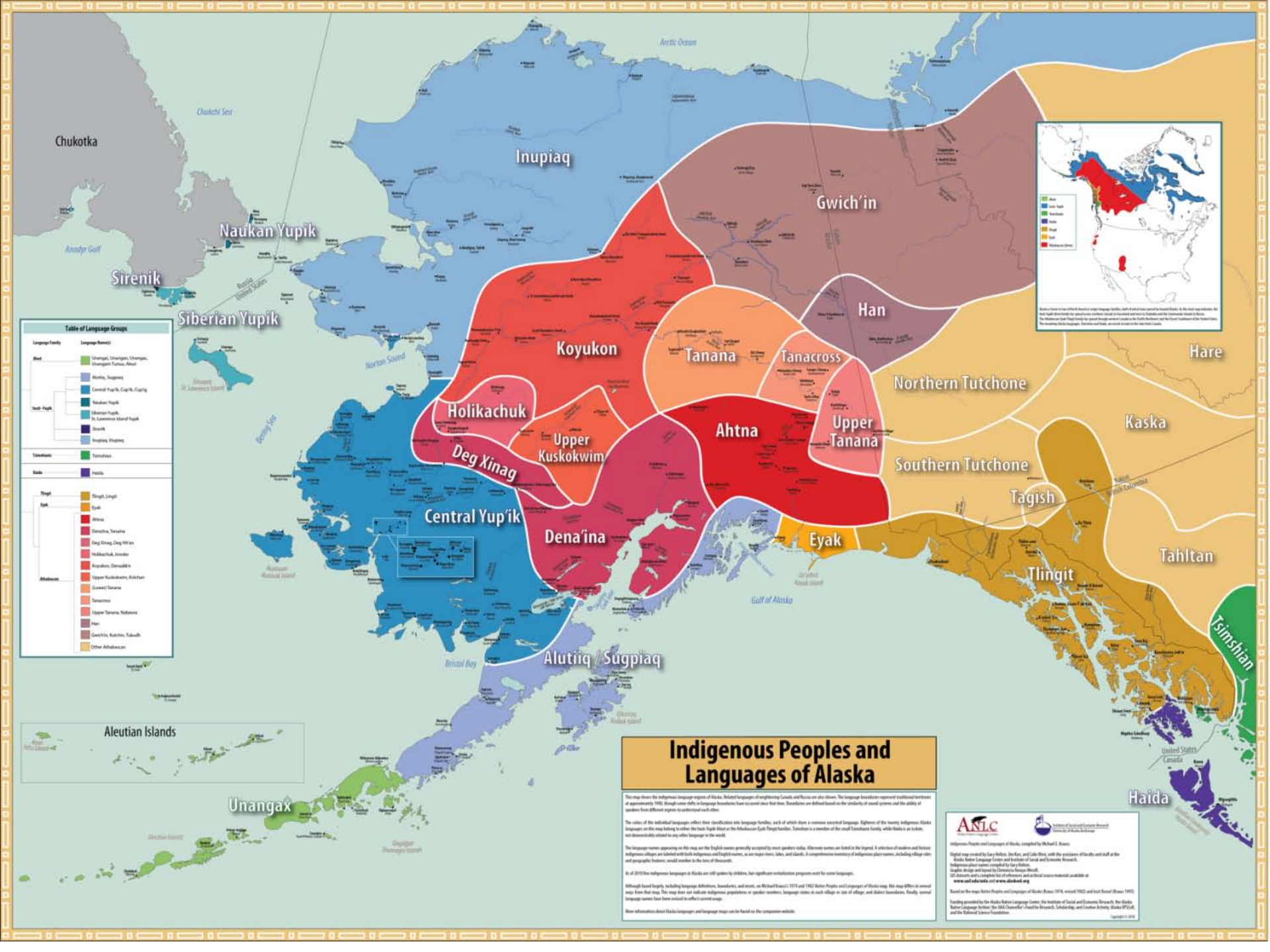
The Information Connection: Benefits of Information and Communication Technologies (ICTs)

- ***Efficiency:*** **Saving time and money**
  - **Logistics for transport and tourism**
  - **Ordering supplies and spare parts**
  - **Arranging clinic visits**
  - **Arranging to get perishable products to market**
- ***Effectiveness:*** **Improving quality of services**
  - **Education:**
    - **Adult education: university courses; GED completion**
    - **Schools: supplementary materials, online courses**
  - **Health Care:**
    - **Consultation between village health workers and physicians**
    - **Training for health workers**
    - **Access to specialized expertise**
- ***Equity:*** **Bridging Digital Divides**
  - **Urban and rural; rich and poor; minorities; disabled**

Alaska: Context

- Largest state: 571, 951 sq. miles
- Population: >710,000
- Lowest population density: 1.2 persons per sq. mile
- Half pop. in Anchorage

- Alaska natives: 14.8% of population
- 6 major linguistic/cultural groups, 226 tribes
- 2/3 live in more than 200 villages
- Very limited road system
- Many villages accessible only by boat or bush plane



Indigenous Peoples and Languages of Alaska

This map shows the indigenous language regions of Alaska. Related languages of neighboring Canada and Russia are also shown. The language boundaries represent traditional territories at approximately 1900, though some shifts in language boundaries have occurred since that time. Boundaries are defined based on the similarity of sound systems and the ability of speakers from different regions to understand each other.

The colors of the individual languages reflect their classification into language families, each of which share a common ancestral language. Eighteen of the twenty indigenous Alaska languages on this map belong to either the Inuit-Yupik-Aleut or the Athabascan-Eyak-Tlingit families. Tsimshian is a member of the small Tsimshianic Family, while Haida is an isolate, not demonstrably related to any other language in the world.

The language names appearing on this map are the English names generally accepted by most speakers today. Alternate names are listed in the legend. A selection of modern and historic indigenous villages are labeled with both indigenous and English names, as are major rivers, lakes, and islands. A comprehensive inventory of indigenous place names, including village sites and geographic features, would number in the tens of thousands.

As of 2010 five indigenous languages in Alaska are still spoken by children, but significant revitalization programs exist for some languages.

Although based largely, including language definitions, boundaries, and extent, on Michael Krauss's (1974 and 1982 Native Peoples and Languages of Alaska map, this map differs in several ways from that map. This map does not indicate indigenous populations or speaker numbers; language status in each village or size of village; and dialect boundaries. Finally, several language names have been revised to reflect current usage.

More information about Alaska languages and language maps can be found on the companion website.

ANLC

Institute of Social and Economic Research
University of Alaska Anchorage

Indigenous Peoples and Languages of Alaska, compiled by Michael E. Krauss.

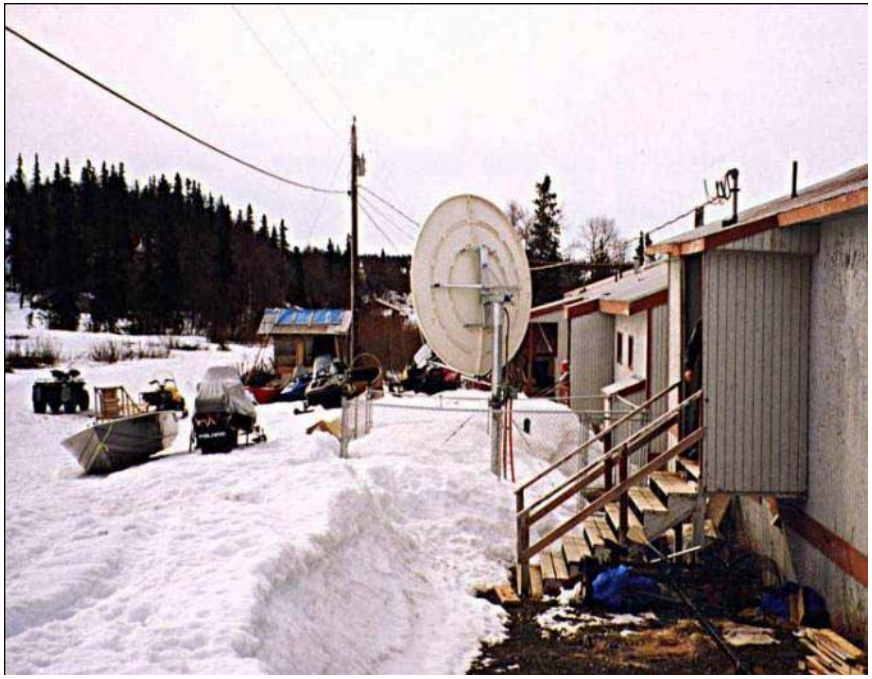
Digital map created by Gary Holton, Jim Kari, and Colin West, with the assistance of faculty and staff at the Alaska Native Language Center and Institute of Social and Economic Research.
Indigenous place names compiled by Gary Holton.
Graphic design and layout by Clementia Amaya-Morrill.
GIS datasets and a complete list of references and archival source materials available at
www.uaf.edu/anla and **www.alaskool.org**

Based on the maps Native Peoples and Languages of Alaska (Krauss 1974, revised 1982) and Inuit Nunat (Krauss 1995).

Funding provided by the Alaska Native Language Center, the Institute of Social and Economic Research, the Alaska Native Language Archive, the UAA Chancellor's Fund for Research, Scholarship, and Creative Activity, Alaska EPSCoR, and the National Science Foundation.

From “Bush Telegraph” to Broadband

- **Early days: communication by HF radio**
- **Since 1980s, all permanent communities of at least 25 people have telephone service**
- **>95% of households have telephones**
- **Broadband in Anchorage and large towns**
- **Rural/remote service typically 768 kbps**
- **Remote service by satellite:**
  - **Generally reliable, but latency, high cost**



Community Access in Rural Alaska:

At the post office, at the store, or under a tree…

Internet Access in Rural Alaska:

Some village households have their own Internet connection

Satellite Facilities

Alaska Fiber Optic System

Rural Broadband: Entrepreneurship and Services

- *Reach*
  - New markets, new audiences
- *Market Information*
  - Getting price information
  - Getting competitive bids
  - New sources of supplies
- *Government Information online*
  - Fishing, hunting licenses
  - Permanent Fund applications
  - Permits, etc.
- *Native Organizations: Management and Fundraising*
  - Grant applications online
  - Filing reports for federally funded projects

Broadband for access to funding and government services

Community managers and development workers must apply for grants and file reports for projects online

E-government: state licenses, forms available online

Entrepreneurship: Native Telephone Co-ops

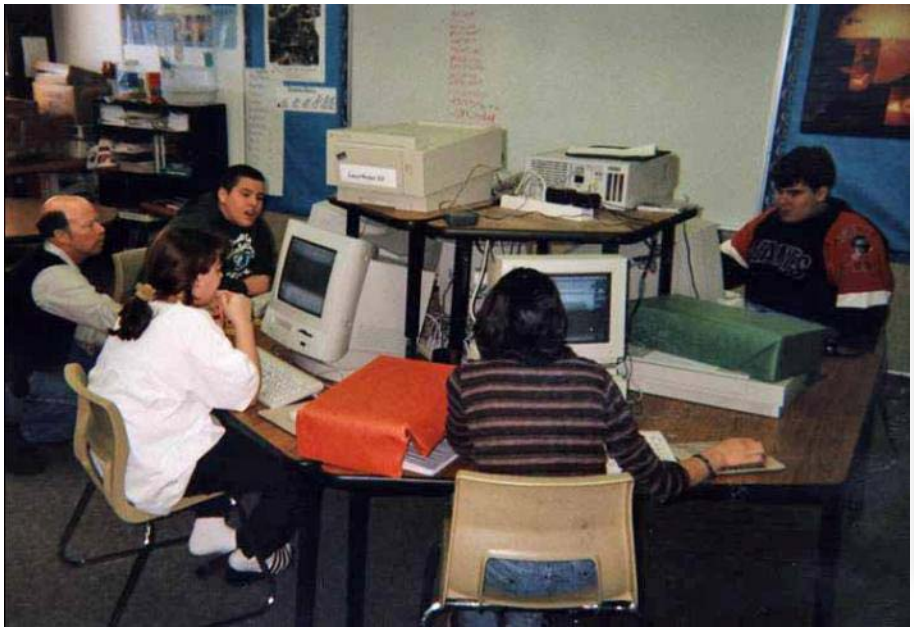
Alaska: Challenges in Rural Education and Health Care Delivery

- **Shortage of professionals**
  - **teachers, physicians**
- **Distance from specialized expertise**
  - **medical specialists**
  - **teachers of specialized and advanced subjects**
- **Problems exacerbated by poverty and isolation**
- **Lowest population density in U.S.**

Internet Access for Schools in Rural Alaska

- **Supplementary materials**
- **Online classes**

Adult distance education



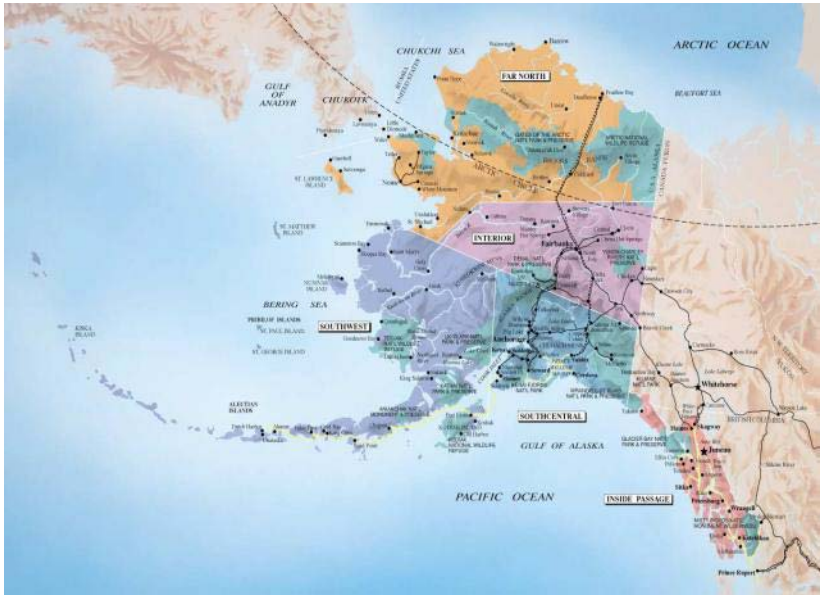
Telemedicine in Alaska

AFHCAN Telehealth System:

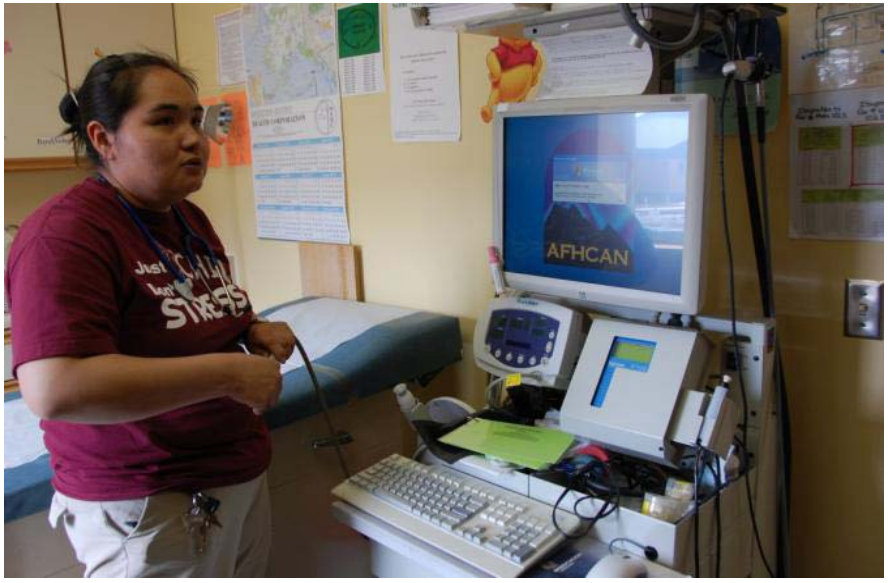
- **250 sites; 70 member organizations**
  - **Village clinics: Native health aides**
  - **Public Health clinics**
  - **Regional hospitals**
  - **Military installations, Coast Guard, Veterans Administration**
- **Covers more than 212,000 beneficiaries**
  - **About 40% of Alaska population**
  - **Majority are in Alaska native villages**

Telemedicine in Wales: Inupiat Village on the Bering Sea

- Closest mainland settlement to Siberia
- Part of Norton Sound Health District (Bering Straits Native Corporation)
- Regional Hospital in Nome

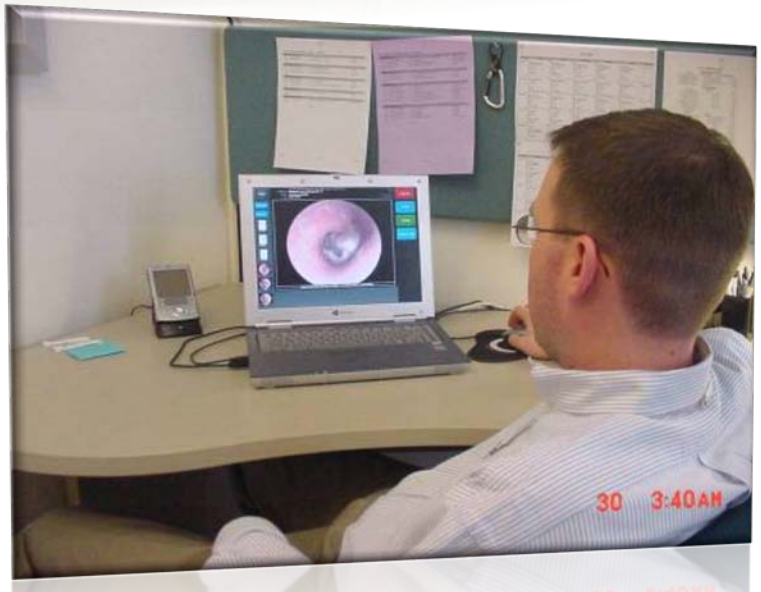


Wales: Clinic with Health Aide and Telemedicine Facilities



Case originated…

Case received…Alaska Native Medical Center, Anchorage



Native IT Training : Inutek.net
Maniilaq Training & Recruitment Program

- **Kotzebue: Inupiat regional hub community on the Bering Sea**
- **Partnership of health care provider and telecom carrier**
- **Recruit locally in villages**
- **Work with the school district to identify students who are interested in technology**
- **Provide summer employment while they are in school**
- **Build a highly motivated and qualified team of local network technicians**

Access: Providers and Users

Access from the providers' perspective:

- **Houses passed: wireline fiber, coax, copper, etc.**
- **Coverage for wireless technologies**

Users'perspective:

- **Availability**
  - **Houses passed or wireless coverage**
  - **Community: school, library, community center**
- **Affordability**
  - **Price for commonly used services**
  - **Price as percentage of disposable income**
- **Skills**
- **Content, applications**

Access Policy Targets

- **Household access** — U.S.: Broadband
- **Personal access**
  - wireless phones, PDAs, laptops, netbooks
- **Institutional access:**
  - SMEs, NGOs, government agencies, etc.
- **Public access**
  - Single national model (e.g. post offices);
  - Variety of public access models (telecenters, PCCs, cybercafés, other shops, NGOs, etc.); — Internet, broadband
  - Schools and libraries; — Internet, broadband
  - Other institutions, such as government offices, community centers, banks
- **Geographic access**
  - Within specified distance of access point
- **Other criteria**
  - Population, administrative function, etc. — Voice: Alaska

Broadband: U.S. Stimulus Projects

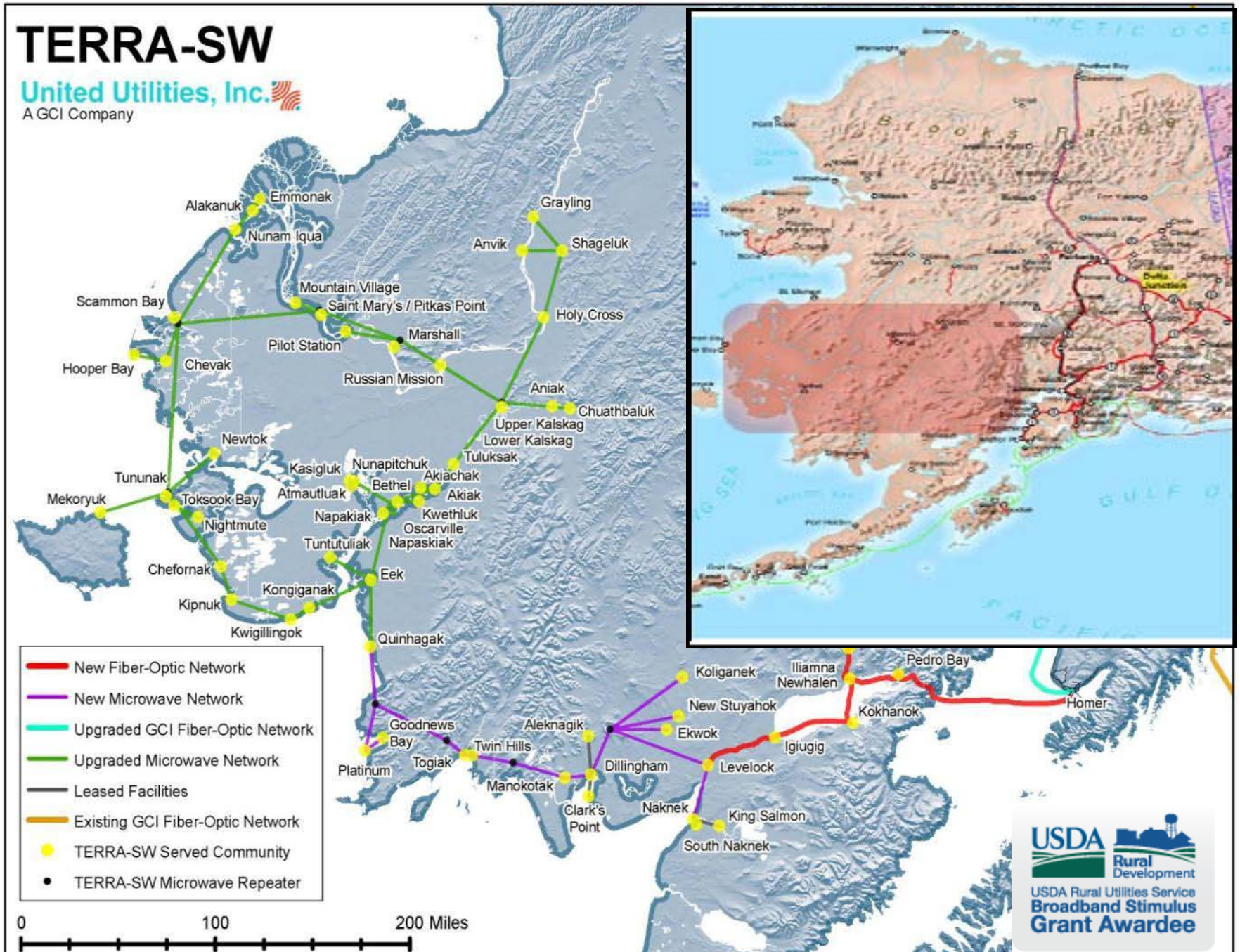
- NTIA (Dept. of Commerce):
  - BTOP (Broadband Telecom Opportunities Program) ($4.7 billion)
  - Alaska Projects:
    - OWL: Online with Libraries
    - Bridging the eSkill Gap: Community access, training, applications
    - Connect Alaska: Planning and Mapping
- Rural Utilities Service (RUS), Dept of Agriculture:
  - Broadband Infrastructure Program (BIP): grants and loans ($2.5 billion)
  - Alaska Projects:
    - TERRA (GCI/UUI): SW Alaska (middle mile)
    - Rivada Sea Lion: SW Alaska (wireless last mile)
    - Copper Valley: Cordova, McCarthy
    - Supervision: Tanana
- Other Stimulus Initiatives involving ICTs:
  - Electronic health record systems, other health IT
  - Energy: Smart Grids
  - Department of Education
  - Public Safety and Homeland Security

Alaska RUS (BIP) Projects

Alaska received more than $117 million in BIP rural infrastructure projects:

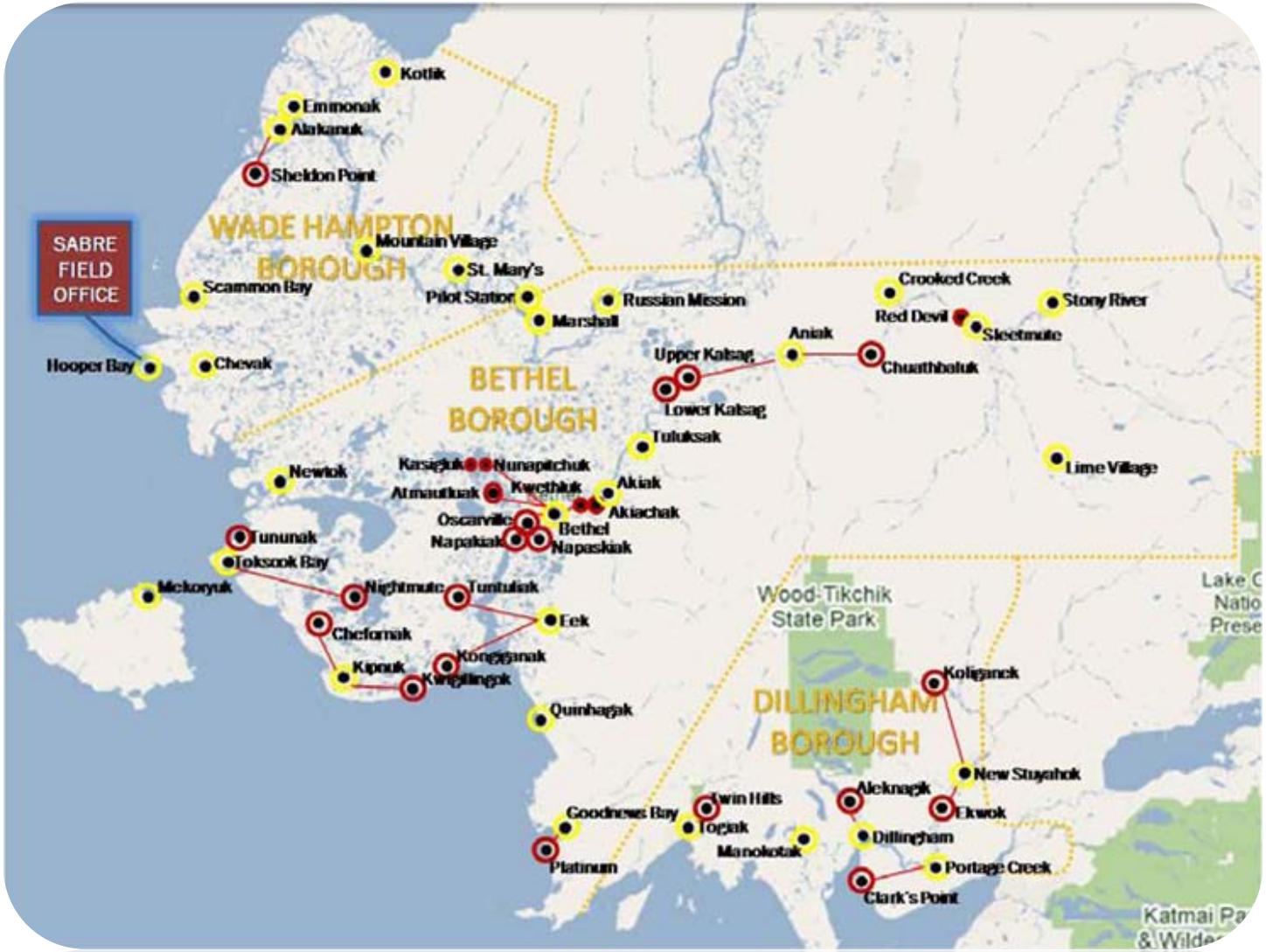
- **TERRA SW: ($88 million in grants and loans) will provide terrestrial connectivity through an hybrid optical fiber and microwave middle-mile network to 65 villages in Bristol Bay and the Yukon-Kuskokwim regions.**
- **SABRE (Southwest Alaska Broadband Rural Expansion): ($24 million) is intended to provide wireless 4th generation (4G) broadband service to southwest Alaska through a partnership between a telecommunications company and a subsidiary of Sea Lion Corporation, the Alaska Native Village Corporation for Hooper Bay.**
- **Copper Valley ($8.7 million): is to provide broadband for a few isolated communities near Valdez.**
- **Spacenet/Starband: one of the satellite providers funded to provide free satellite equipment and installation plus discounted service to residents who do not have other options to access broadband. Spacenet's funding was specifically for Hawaii and Alaska.**

TERRA: $88 million RUS grants and loans, 65 communities



SABRE: Planned Service Area

Covers 53 rural communities in southwest Alaska, a 90,000 square mile area.



USDA Rural Development
USDA Rural Utilities Service
Broadband Stimulus Grant Awardee

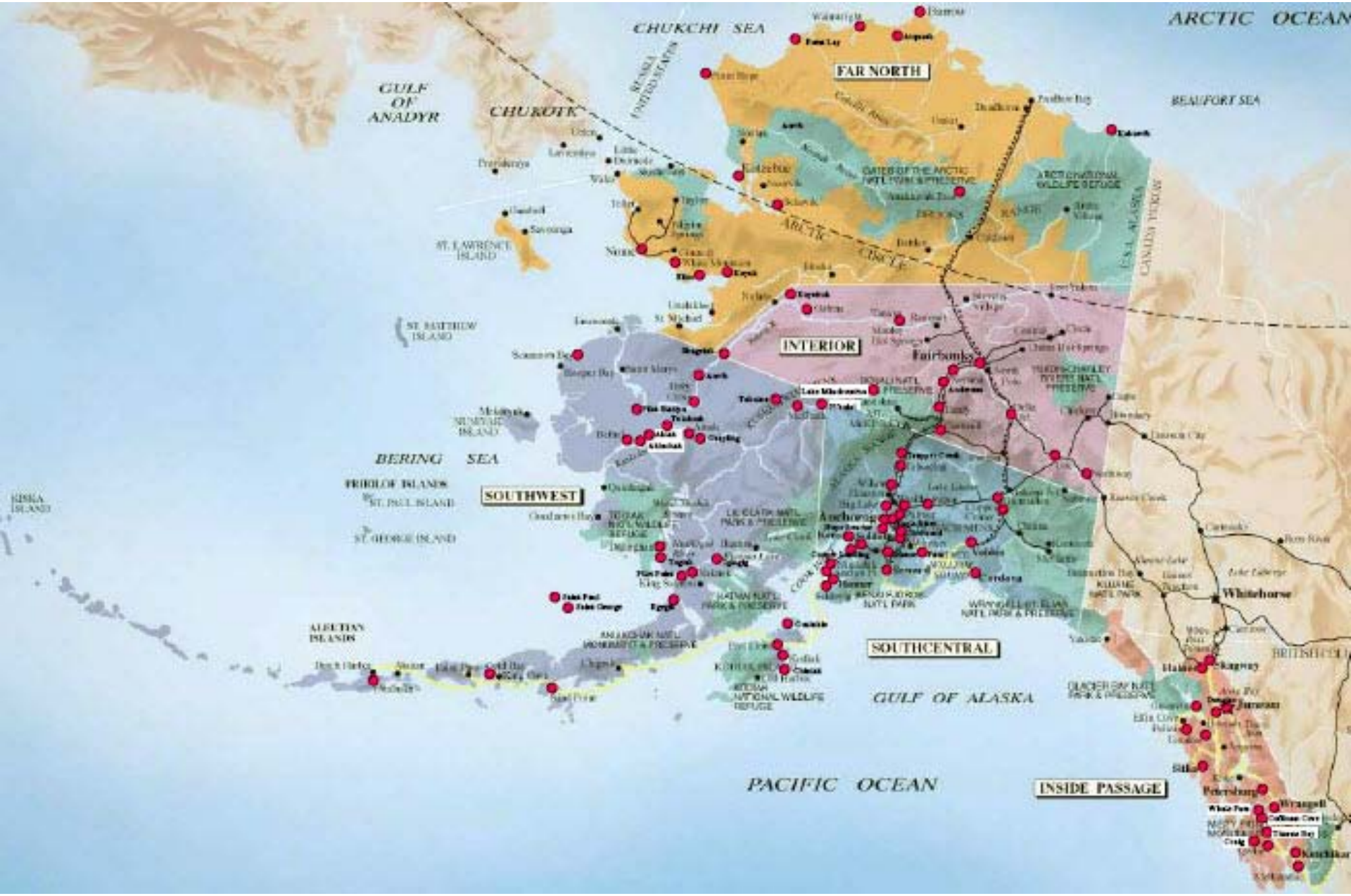
Stimulus-Funded Project for Alaska Libraries

- **Broadband-buying consortium + E-rate for libraries under American Library Association**
- **Recommended standard = 1.5 Mbps**
- **Videoconferencing/webconferencing network**
- **Equipment for all libraries**
- **IT Support for libraries open less than 20 hours per week**
- **Training for all libraries**

Potential beneficiaries:

- **Remote library users where home ownership and subscriptions are lowest**
- **Students – K-12 Live Homework Help, 1 on 1**
- **Adult students – University, Vocational, Certificates**
- **State agencies**

OWL (Online with Libraries) sites (NTIA BTOP)



Helping to Pay for Rural Telecommunications: Universal Service Fund Support for Alaska

Federal Universal Service Fund

Surcharges on all telephone bills

In 2009, Alaskan subscribers contributed about $19 million and received $244 million, or more than $12 for every dollar paid in.

- ***Internet and Connectivity:***
  - **Internet for Schools and Libraries**
    - **Supported by the USF E-Rate program**
    - **Alaska received $29m in 2010; $155m from 1998 through 2009**
      - **Highest per capita of any state**
- ***Rural Telemedicine:***
  - **Supported by USF Rural Health Care Program:**
    - **Alaska receives the largest amount of any State: $35.5m in 2010**
- ***Voice Services:***
  - **High Cost Support:**
    - **Alaska companies received $219m in 2010**
  - **Low Income Subscribers:**
    - **Lifeline and Linkup: Alaska low income subscribers received subsidy of $26.8m in 2010**

FCC's National Broadband Plan: Goals

- **Speed: "100x100":** At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 Mbps and actual upload speeds of at least 50 Mbps.
- **Access and Skills:** Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
- **Anchor Institutions:** Every community should have affordable access to at least 1 Gbps broadband service to anchor institutions such as schools, hospitals and government buildings.
- **Mobile Innovation:** The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
- **Public Safety:** To ensure the safety of Americans, every first responder should have access to a nationwide public safety wireless network.
- **Energy Management:** To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

Steps to Achieve U.S.Broadband Plan: Universal Service Goals

- **Connect America Fund**
  - **Affordable broadband and voice with at least 4 mbps down and 1 mbps upload speed**
- **Mobility Fund**
  - **National 3G coverage; support for 4G**
- **Retain and improve E-Rate Program**
- **Reform High Cost Fund**
  - **Include broadband**
- **Update Low Income Funds to include broadband**

(For more information, see www.broadband.gov and www.fcc.gov)

FCC Rural Broadband Reviews Affecting Alaska

National Broadband Plan:

- **Connect America Fund**
  - **Affordable broadband and voice with at least 4 mbps down and 1 mbps upload speed**
- **Mobility Fund**
  - **National 3G coverage; support for 4G**

FCC Activities: 2010/2011

- **Connect America Fund and High Cost Support:**
  - **FCC NOI and Proposed Rulemaking: Adopted April 21, 2010**
- **Upgrading E-Rate for the 21st Century:**
  - **FCC 6th Report and Order: Adopted Sept 23, 2010**
- **Review of Lifeline and Linkup Programs:**
  - **"Universal service support should be directed where possible to networks that provide both broadband and voice services."**
- **Native American Broadband Task Force: 2011**
- **NOI on Improving Communications Services for Native Nations: 2011**
- **Connect America Fund NPRM, 2011**

USF Reform: Connect America Fund

- **High Cost Fund represented more than 70 percent of the USF subsidies for Alaska in 2010**
- **FCC's Connect America Fund Order**
  - **Executive Summary released Oct 26, 2011**
  - **Connect America Fund:**
    - **CAF to ultimately replace all high cost support**
    - **High Cost Fund will be frozen at $4.5b (same level as FY11)**
    - **Requires carriers receiving legacy high cost support for voice to also offer broadband with speeds 4 Mbps downstream and 1 Mbps upstream**
    - **Customers in service area must request broadband**
  - **CAF Mobility Fund**
    - **$300 million for mobile voice and broadband in high cost areas, plus $500 million/year ongoing support**
    - **Tribal areas up to $100 million/year**
  - **Remote Areas Fund: $100 million/year**

State Broadband Activities

- **Rural Alaska Broadband Internet Access Grant Program**
  - **Regulatory Commission of Alaska (RCA), funds from USDA**
  - **For low income communities**
  - **Required speed only 768 kbps**
  - **Carriers receive up to 75% of construction costs; must keep rates comparable to urban rates for 2 years**
- **Connect Alaska:**
  - **Stimulus funding from NTIA**
  - **state broadband map**
  - **Support for training, content development, digital literacy**
- **State Broadband Task Force**
  - **Broadband planning funds from NTIA**
  - **See www.connectak.org**

Beyond Infrastructure:

- ***From Access to Adoption***
  - **Understanding non-adopters**
  - **Develop training, applications**
- ***Improve Skills:***
  - **Ensure Alaskans can use these tools**
- ***Develop Applications:***
  - **For rural businesses and Services**
- ***Involve Alaska Natives:***
  - **National goals/benchmarks may not reflect the needs of Alaska Native communities**
  - **Need to understand barriers to adoption**
  - **Need to collect and verify data on rural access**
- ***Evaluation: Learning about Broadband Impacts:***
  - **For consumers: adults and young people**
  - **For schools**
  - **For health care**
  - **For businesses and organizations**

Institute of Social and Economic Research

UAA University of Alaska Anchorage

Thank You

For more information: hehudson@uaa.alaska.edu

www.iser.uaa.alaska.edu