



Institute of Social and Economic Research



UNIVERSITY of ALASKA ANCHORAGE

Broadband for Rural Development in Southwest Alaska

Heather E. Hudson

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



Information and Communications

Technologies (ICTs): Applications and Benefits

National Purposes

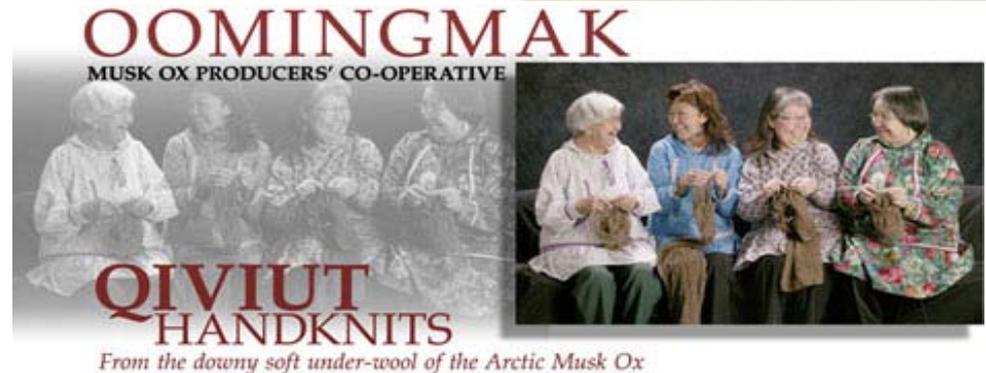
Health Care	Energy/ Environment	Education	Government Operations	Economic Opportunity	Public Safety
<ul style="list-style-type: none"> • Electronic health records • Remote/home monitoring • Mobile monitoring • Telemedicine • Health information exchange 	<ul style="list-style-type: none"> • Smart grid • Smart home applications • Smart transportation • Telework 	<ul style="list-style-type: none"> • American Graduation Initiative • STEM • Nat'l Ed Tech Plan • eBooks and content • Electronic student data management 	<ul style="list-style-type: none"> • Service delivery and efficient government • Improved performance • Transparency • Civic engagement • Policy 	<ul style="list-style-type: none"> • Job creation and economic development • Job training and placement • Community development 	<ul style="list-style-type: none"> • Interoperable mission critical voice and broadband network • Next-gen 9-1-1 • Alerts • Cybersecurity
<p>Innovation and investment</p>		<p>Inclusiveness</p>		<p>Consumer Welfare</p>	

The Information Connection: Benefits of ICTs

- **Efficiency:** Saving time and money
 - Logistics: arranging travel and shipping
 - Time-sensitive products: perishable crops
 - Finding markets and suppliers
- **Effectiveness:** Improving quality of services
 - Education:
 - Continuing education and training
 - At home, in the workplace, at regional centres
 - Support for teachers and students
 - Health Care:
 - Consultation between rural health workers and physicians
 - Access to specialized expertise
 - Continuing education for health staff
 - Integrated computerized medical records
 - Government services:
 - Making government information/services more accessible
- **Equity:** Bridging Digital Divides
 - Urban and rural
 - Rich and poor

Rural Broadband: Creating New Business Opportunities

- **Reach**
New markets, new audiences
- **Market Information**
Getting price information
Getting competitive bids
New sources of supplies
- **Outsourcing/Insourcing**
Doing work for distant clients
Call centers, data entry, translation
- **Funds transfer**
Online banking, investing
Merchant payment systems
Remittance transfers
- **Microfinance**
Connecting lenders with small businesses and entrepreneurs

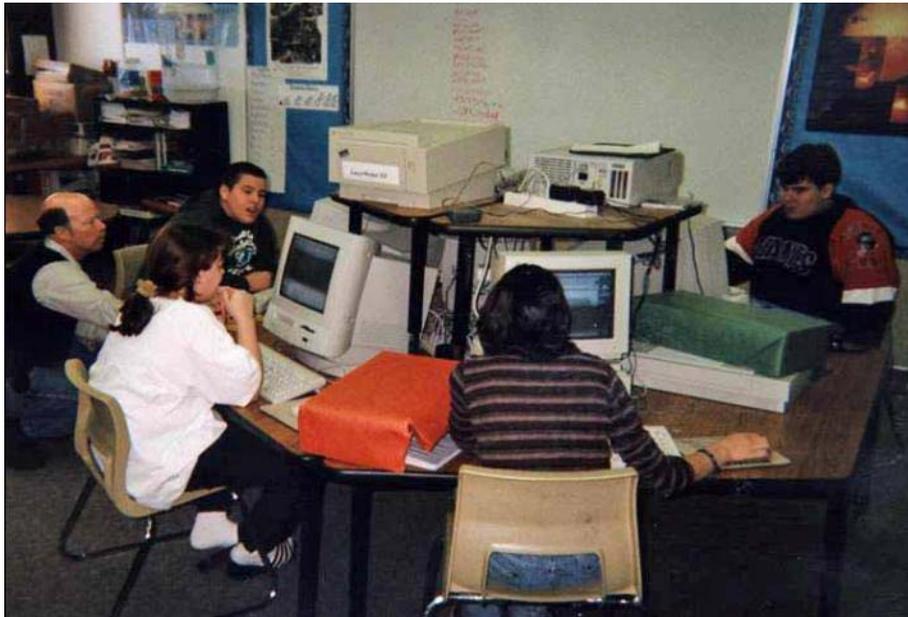


Alaska: Challenges in Rural Education and Health Care Delivery

- **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 in Rural Alaska: Schools/Libraries:



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



Early Telemedicine...

“We went from house to house taking care of the sick... Our tools consisted of a thermometer, a stethoscope, and a blood pressure cuff.... We had no phones... but used the school’s [HF] radio to report [on] our patients. There was no nonsense about confidentiality.”

-- Health aide Paula Ayunerak



Telemedicine in Alaska

AFHCAN Telehealth System:

250 sites; 70 member organizations

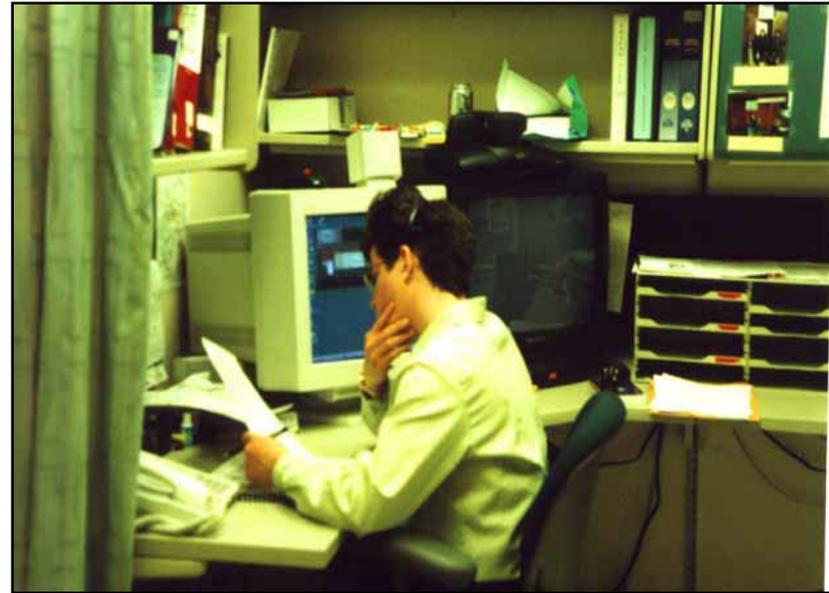
- Village clinics: Native health aides
- Public Health clinics
- Regional hospitals
- Military installations, Coast Guard, Veterans Administration

Covers more than 212,000 beneficiaries

- About 40% of Alaska population
- Majority are in Alaska native villages

- Supported by USF Rural Health Care Program

Alaska receives
the largest amount of
any State: \$29m in 2009



What makes Broadband Accessible?

- **Availability**
 - Houses passed (fiber, coax, copper)
 - Coverage (wireless)
 - Community: school, library, community center
- **Affordability**
 - Price for commonly used services
 - Price as percentage of disposable income
- **Bandwidth**
 - Broadband for Internet access and multimedia
- **Quality of Service**
 - Reliability
 - Outages, jitter
 - Latency (delay)

Universal Service Support for Alaska

Internet and Connectivity:

- **Internet for Schools and Libraries**
 - Supported by the USF E-Rate program
 - Alaska received \$25.5m in 2009; \$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: \$29m in 2009

• *Voice Services:*

- **High Cost Support:**
 - Alaska companies received \$168m in 2009
- **Low Income Subscribers:**
 - Lifeline and Linkup: Alaska low income subscribers received subsidy of \$24.5m in 2009

Lessons from Alaska

- **E-Rate Initiatives:**
 - **Schools, libraries, health centers as subsidized users**
 - **Become anchor tenants in communities**
- **The role of carriers**
 - **Working with schools, health organizations**
 - **Seeing opportunities to leverage subsidies**
- **Aggregation of demand**
 - **School districts, native health corporations**
- **Using policy and regulatory mechanisms**
 - **The “Alaska waiver” for village wireless from USF providers**
- **Wireless Internet access for villages**
 - **WiFi etc. may be used to extend community access to the Internet (e.g. from schools or libraries)**

Federal Stimulus Programs

- **NTIA (Dept. of Commerce):**
 - \$4.7 billion for BTOP (Broadband Telecom Opportunities Program)
 - Includes \$350 million for broadband data and mapping
 - Grants for infrastructure, public computer centers (<\$250 million), and sustainable broadband adoption (>\$350 million)
 - Alaska Projects:
 - OWL
 - Bridging the eSkill Gap
 - Connect Alaska
- **Rural Utilities Service (RUS), Dept of Agriculture:**
 - \$2.5 billion for rural infrastructure projects (BIP)
 - Grant/loan program
 - Alaska Projects:
 - TERRA (GCI/UUI): SW Alaska (middle mile)
 - Rivada Sea Lion: SW Alaska (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

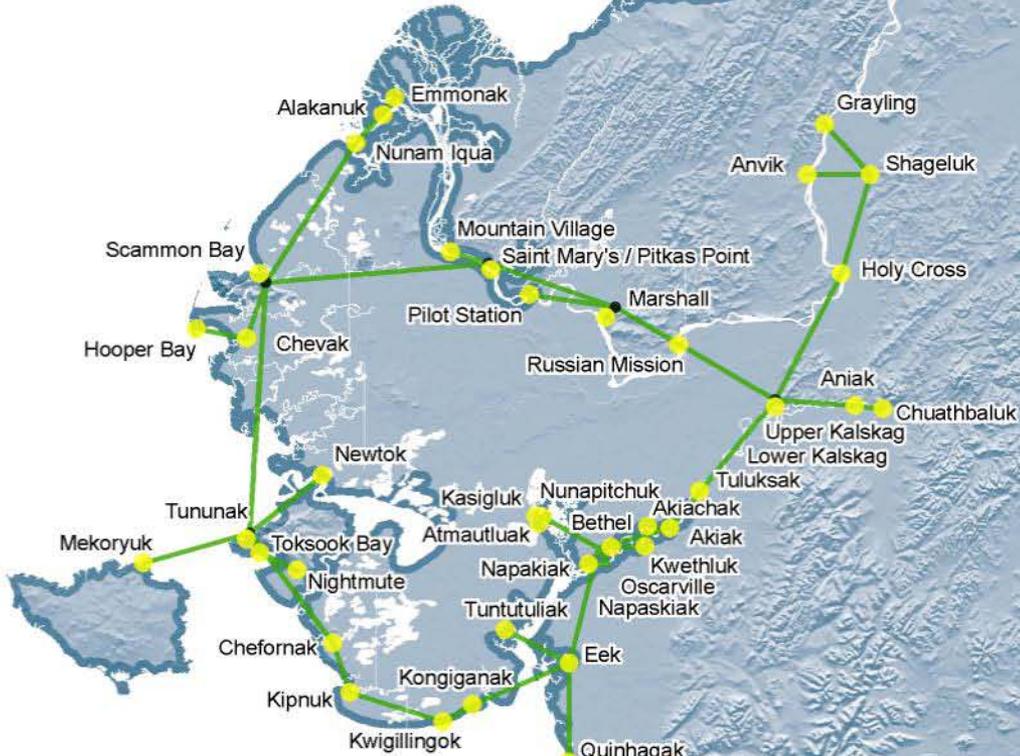
TERRA Southwest



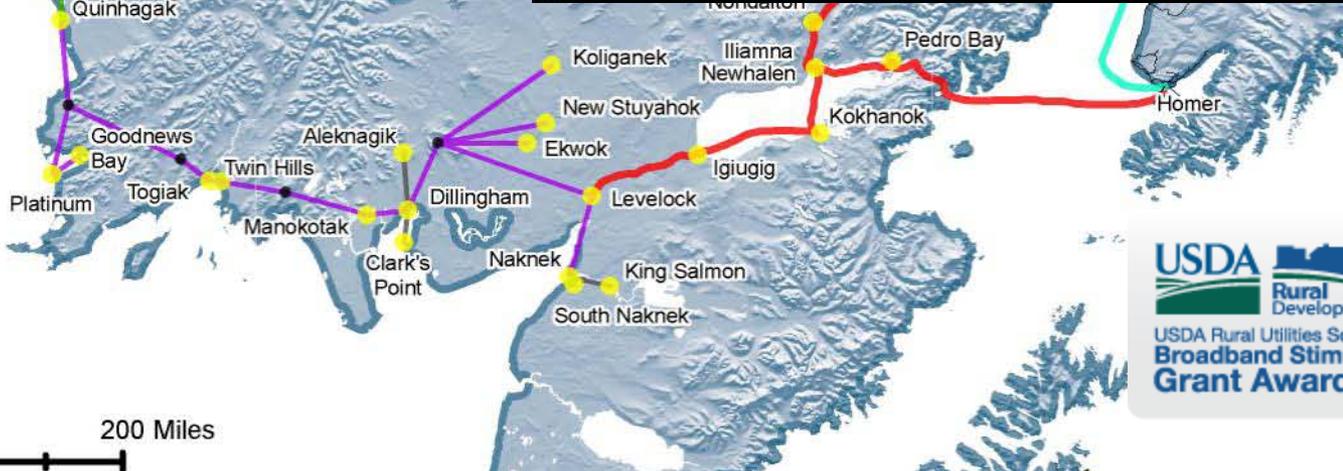
- What is TERRA?
 - Hybrid fiber optic and microwave network
 - Removes limitations of satellite service: latency and capacity constraints
 - Will provide symmetrical broadband service
- Will provide terrestrial connectivity to 65 villages in the Bristol Bay and Yukon-Kuskokwim regions
- Hybrid fiber/microwave network
 - 14 new microwave towers (4 remote/mountaintop)
 - 7 new cable landing stations
 - 9 new fiber segments (subsea, lakebed and buried)
- \$88 million in Stimulus grants and loans from Rural Utilities Service (RUS)

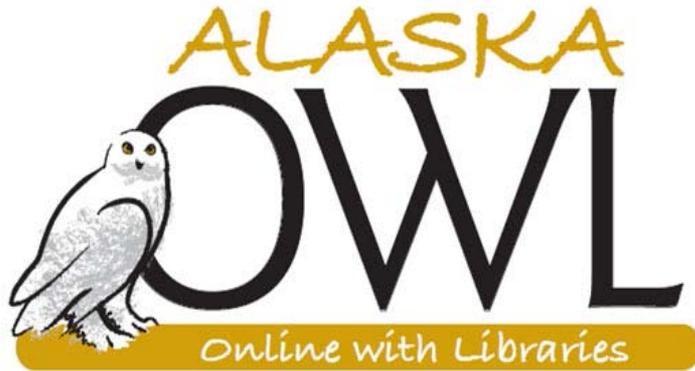
TERRA = Terrestrial for Every Region of Rural Alaska





- New Fiber-Optic Network
- New Microwave Network
- Upgraded GCI Fiber-Optic Network
- Upgraded Microwave Network
- Leased Facilities
- Existing GCI Fiber-Optic Network
- TERRA-SW Served Community
- TERRA-SW Microwave Repeater





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**

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



SABRE Network



- **Southwest Alaska Broadband Rural Expansion (SABRE) Network**
- **\$25.3 million RUS stimulus grant**
- **Project awarded to Rivada Sea Lion LLC (RSL) -- a partnership of:**
 - **Rivada Networks – provider of wireless broadband and voice emergency communication services and**
 - **Sea Lion International – a subsidiary of Sea Lion Corporation, the Alaska Native Village Corporation for Hooper Bay, Alaska.**
- **Wireless 4th Generation (4G) broadband service to SW Alaska**
- **Hi-speed wireless broadband**
- **Backhaul by satellite**
- **Three year project**



SABRE: Planned Service Area

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



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.

Federal Rural Broadband Policy 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 Notice of Inquiry 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**
 - **Notice of Inquiry on Improving Communications Services for Native Nations: March 2011**

State Broadband Activities

- **Rural Alaska Broadband Internet Access Grant Program**
 - **Regulatory Commission of Alaska (RCA)**
- **Connect Alaska:**
 - **state broadband map**
 - **Support for training, content development, digital literacy**
- **State Broadband Task Force**
 - **Broadband planning funds from NTIA**

Connectivity: *Necessary but Not Sufficient*

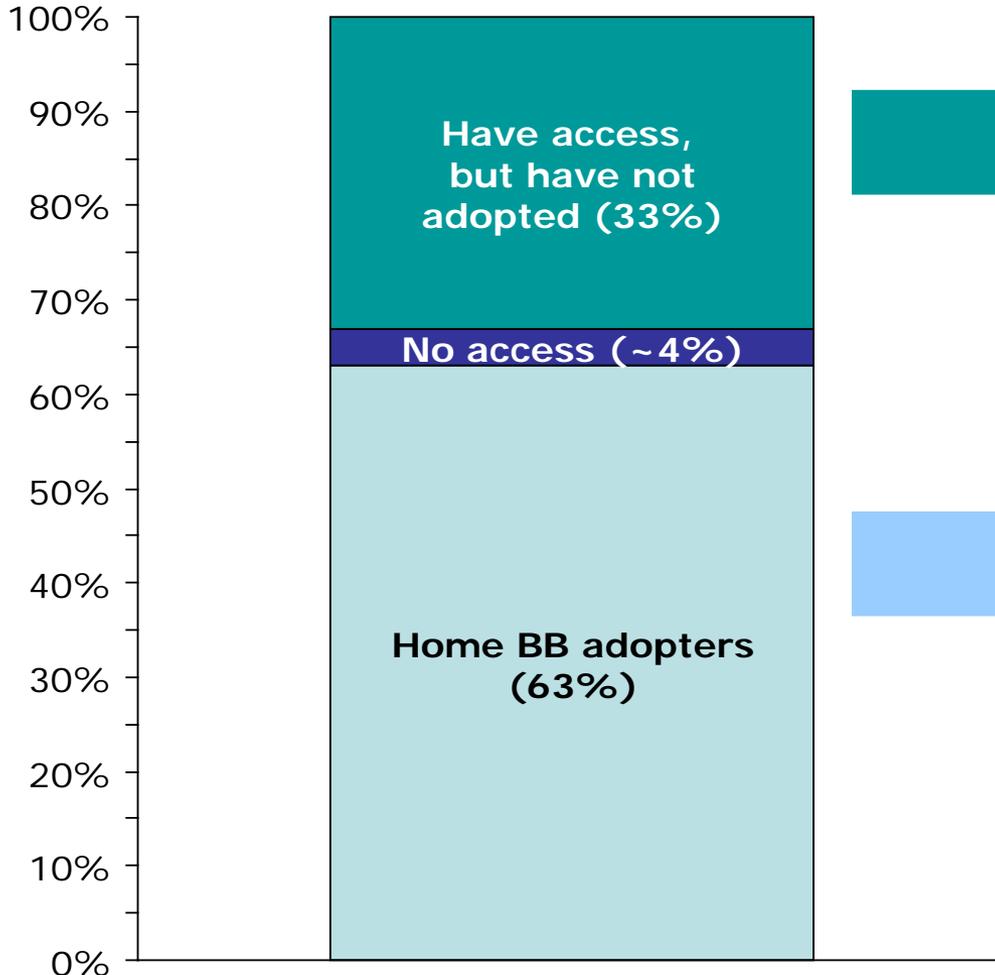
- **Context:**
 - **Social, economic, cultural**
 - Need other infrastructure: transportation, power supply, etc.
 - Other services: local banking, funds transfer
- **Content:**
 - Local languages
 - Relevance to rural conditions
- **Capacity:**
 - Skills to use and manage information facilities
 - “Infomediaries”: the information broker
 - Librarian
 - Public computer center staff
 - Extension agents, etc.



From Access to Adoption:

Barriers to adoption are not well understood

Percent of U.S. households

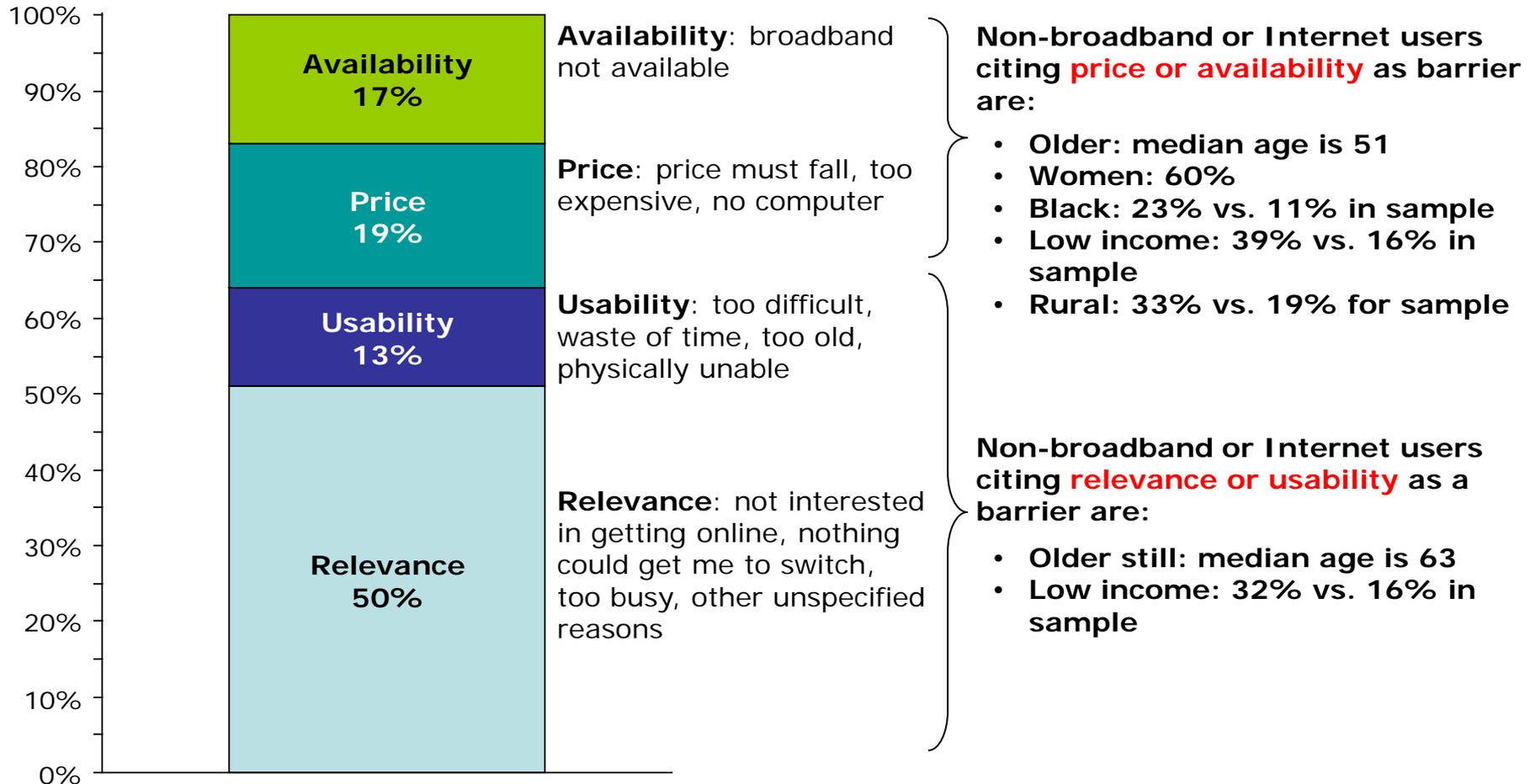


- Limited data on barriers that non-adopters face
- Need better data and understanding on barriers to adoption in Alaska

US: Among non-adopters, lack of relevance cited as main reason for not having broadband at home

Broadband adoption levels

Percent of dial-up or non-Internet users



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 Native Alaskans***
 - 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