

Changing Lives in the Arctic with True Broadband

Sarah Barton, Quintillion, Partner
Steve Merriam, ASTAC, CEO

10/28/15



Quintillion Subsea Cable System

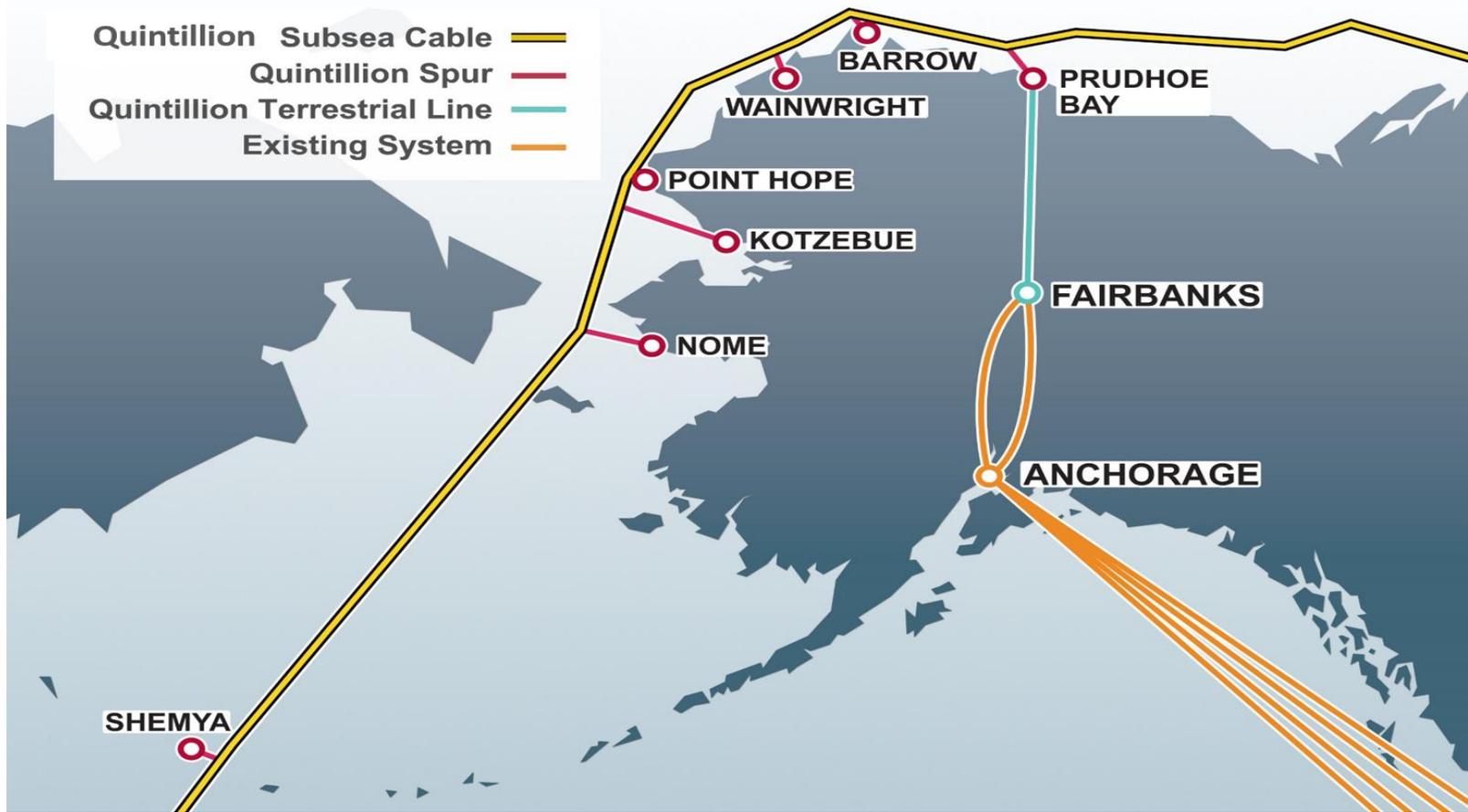


About Quintillion

Elizabeth Pierce – CEO &
Founding Investor

Desiree Pfeffer – CCO &
Investor

- Headquartered in Anchorage, Alaska
- Carrier for the local provider – we provide high speed “broadband” capacity to the local providers – ASTAC, ACS, GCI, etc.
- Managed by Elizabeth Pierce, CEO and Founding Partner
- Funded by US private investment group and select Alaska investors including ANC Investors



Phase 1 - Alaska

Phase 1 Alaska Build Status

- Subsea fiber optic cable connecting to new terrestrial fiber optic cable at Prudhoe Bay
- Scheduled in-service Q1 2017
- Turnkey contract with Alcatel Submarine Networks to provide and install the subsea cable systems
- Cable landing site construction commenced in 2013 and continuing this year with HDD bores for shore landings
- FCC Landing License application will be submitted October 2015
- Sister company constructing new fiber along Dalton Highway

Private Carrier

Providing backhaul capacity
to all communication
service providers

- Capacity is available to all communication service providers
- Existing carriers in Canada and Alaska suffer from lack of competition among middle mile providers – who are often also last mile competitors - leading to usurious middle-mile backhaul costs
- Carrier pricing 50 to 70% lower than existing satellite and microwave options
- Alaska needs lower cost service to ensure essential services to consumers and economic stimulus and growth

Purpose and Benefit to Community

- Education
- Healthcare
- Public Safety
- Search & Rescue
- Government Services

High-speed Bandwidth stimulates community development:

- Enables extensions to connect more communities
- Carrier neutral: All telecoms can use the networks
- Substantially improve communication service while reducing costs
- Enables improvements in education, health care, public safety, search and rescue
- Stimulates economic growth
- Reduce the cost of delivering Government Services

Why Alaska Needs Fiber...

Location	Monthly Cost	Speed (Mbps)	Monthly Capacity Limit	Price Per Mbps
Barrow, Alaska²	\$215.00	6	60 Gbps	\$35.84
Kansas City, MO ¹	\$70.00	1000	No Cap	\$0.07
Chattanooga, TN ¹	\$69.69	1000	No Cap	\$0.06
San Francisco, CA ¹	\$30.00	200	No Cap	\$.015
Seoul, South Korea ¹	\$30.30	1000	No Cap	\$0.03

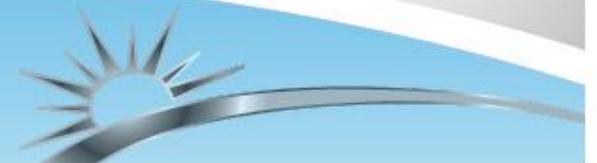
(1) As published by Open Technology Institute, New America Foundation; "The Cost of Connectivity 2014"

(2) Quoted on GCI website, October 2014

Access to robust and affordable broadband is key to the economic future of Alaska. Bringing 21st century technologies to the Arctic will allow us to develop 21st century economies by connecting to the rest of Alaska and the rest of the world quickly, efficiently, and cost effectively.

About ASTAC

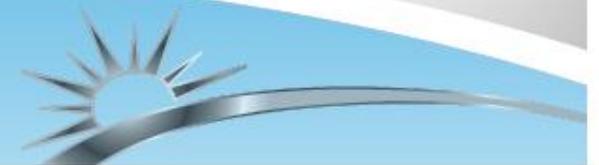
- Serving the North Slope Borough since 1980
- Exchanges include the oilfields of Prudhoe Bay, City of Barrow and seven native villages spread across the region.
- Provide wireline, wireless, Internet (fixed and nomadic via 700MHz) and LD service



About ASTAC

If the North Slope Borough were a state...

Rank	State Name	Square Miles
1	Alaska	663,267
2	Texas	268,581
3	California	163,696
4	Montana	147,042
5	New Mexico	121,589
6	Arizona	113,998
7	Nevada	110,561
8	Colorado	104,094
9	Oregon	98,381
10	Wyoming	97,814
11	Michigan	96,716
12	North Slope Borough	94,796
12	Minnesota	86,939



Satellite Middle Mile Constraints

- Prohibitively Expensive
- High Latency
- Limited Capacity

- Two examples from the E-Rate Program



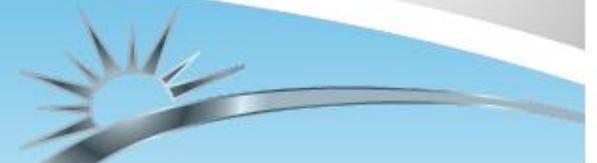
NSBSD Network/Costs

Barrow - 8 schools/Locations:

- Ipalook Elementary School
- Eben Hopson Middle School
- Barrow High School
- Kiita Learning Center
- Central Office and Annex
- Maintenance & Operations
- Student Transportation

Internet bandwidth requested in 2014 RFP: 11.5/11.5Mbps (2Mbps increments to 21.5)

Winning Bid: \$28,175 MRC or \$2,450/Mbps



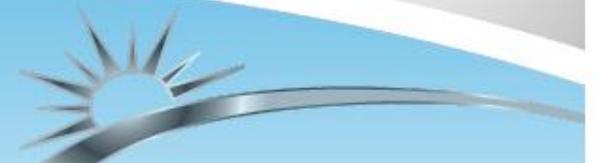
NSBSD Network/Costs

7 Village schools:

- Nunamiut School, Anaktuvuk Pass
- Meade River School, Atqasuk
- Harold Kaveolook School, Kaktovik
- Nuiqsut Trapper School, Nuiqsut
- Tikigaq School, Point Hope
- Alak School, Wainwright
- Kali School, Point Lay

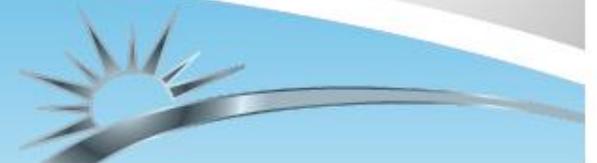
Internet bandwidth requested in 2014 RFP: 2.5/1.5Mbps (1/.5Mbps increments to 10.5/5.5Mbps)

Winning Bid: \$6,130 MRC or \$2,452/Mbps per school



2015 RUS Community Connect Grant Recipient

- Awarded \$1,418,502 to bring fiber to the home in Point Hope Alaska
- 68 grant applicants nationwide in 2015; 5 projects funded by the grant
- ASTAC provides a 15% cash match
- Must provide free broadband to all Critical Community Facilities for two years.

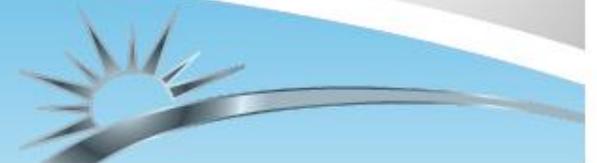


ASTAC Board Resolution

RESOLUTION 2015-12

Network Extension Resolution

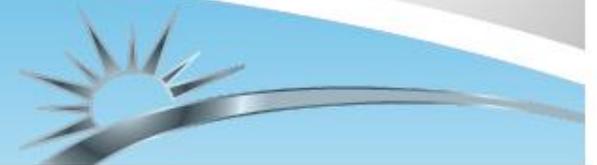
RESOLVED that management is directed to pursue, by all means possible, funding to extend broadband to the communities not initially reached by the Quintillion Undersea Fiber (Point Lay, Atkasuk, Kaktovik and Anaktuvuk Pass). Possible sources of funding would include, but not be limited to, self-funding from net margins, partnering with the North Slope Borough and Arctic Slope Regional Corporation, applying for available government and foundation grants and securing additional prudent debt.



Extending fiber to the villages

95 miles

62 miles



Extending fiber to the villages



62-70 miles
Possible spur option

69 miles

