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...

<table>
<thead>
<tr>
<th>Location</th>
<th>Monthly Cost</th>
<th>Speed (Mbps)</th>
<th>Monthly Capacity Limit</th>
<th>Price Per Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow, Alaska²</td>
<td>$215.00</td>
<td>6</td>
<td>60 Gbps</td>
<td>$35.84</td>
</tr>
<tr>
<td>Kansas City, MO¹</td>
<td>$70.00</td>
<td>1000</td>
<td>No Cap</td>
<td>$0.07</td>
</tr>
<tr>
<td>Chattanooga, TN¹</td>
<td>$69.69</td>
<td>1000</td>
<td>No Cap</td>
<td>$0.06</td>
</tr>
<tr>
<td>San Francisco, CA¹</td>
<td>$30.00</td>
<td>200</td>
<td>No Cap</td>
<td>$0.015</td>
</tr>
<tr>
<td>Seoul, South Korea¹</td>
<td>$30.30</td>
<td>1000</td>
<td>No Cap</td>
<td>$0.03</td>
</tr>
</tbody>
</table>

(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...

<table>
<thead>
<tr>
<th>Rank</th>
<th>State Name</th>
<th>Square Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alaska</td>
<td>663,267</td>
</tr>
<tr>
<td>2</td>
<td>Texas</td>
<td>268,581</td>
</tr>
<tr>
<td>3</td>
<td>California</td>
<td>163,696</td>
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<tr>
<td>4</td>
<td>Montana</td>
<td>147,042</td>
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<tr>
<td>5</td>
<td>New Mexico</td>
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<tr>
<td>6</td>
<td>Arizona</td>
<td>113,998</td>
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<tr>
<td>7</td>
<td>Nevada</td>
<td>110,561</td>
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<tr>
<td>8</td>
<td>Colorado</td>
<td>104,094</td>
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<tr>
<td>9</td>
<td>Oregon</td>
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<tr>
<td>10</td>
<td>Wyoming</td>
<td>97,814</td>
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<tr>
<td>11</td>
<td>Michigan</td>
<td>96,716</td>
</tr>
<tr>
<td>12</td>
<td><strong>North Slope Borough</strong></td>
<td><strong>94,796</strong></td>
</tr>
<tr>
<td>12</td>
<td>Minnesota</td>
<td>86,939</td>
</tr>
</tbody>
</table>
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
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.
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, Atqasuk, 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