Tribal Engagement and Best Practices
Arctic Slope Telephone Association Cooperative, Inc./ ASTAC Broadband, LLC

August 9th, 2022

Like Other Ultra-Remote Alaska Communities the Arctic North Slope is Unique in Many Ways

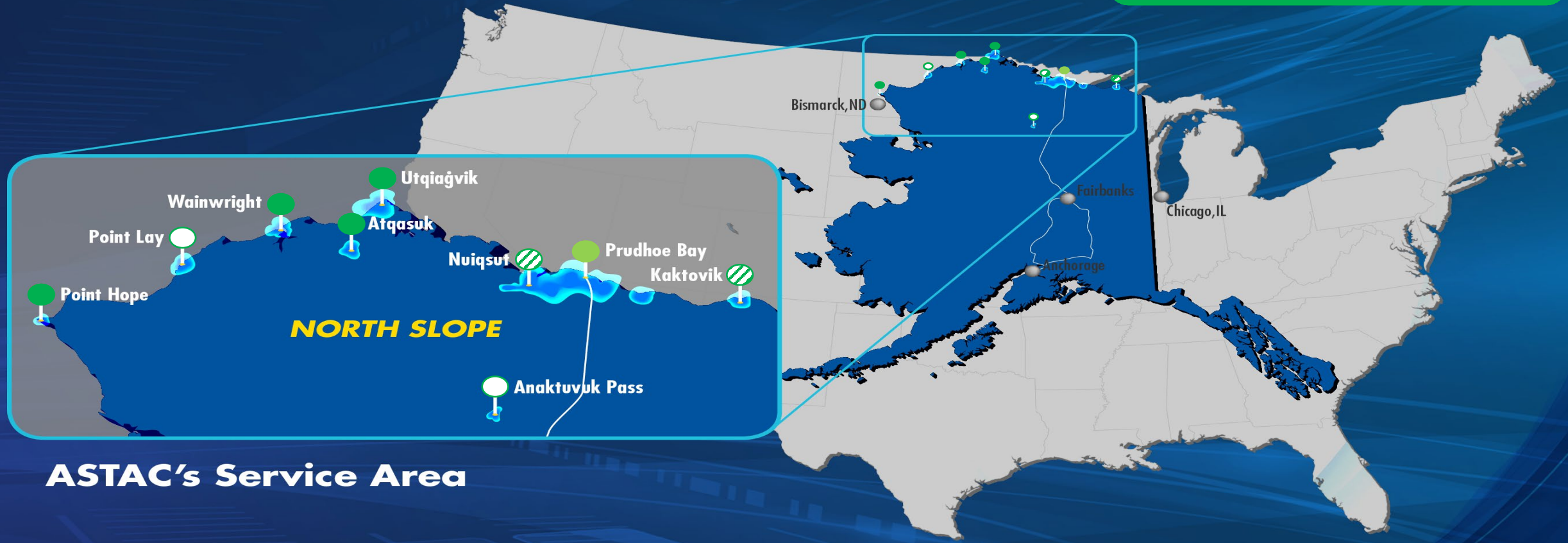
- Harsh Arctic environment
  - 66 days of no sun
- Winter builds requires different labor rules
- Roadless* serving area
  - Small plane ride
  - Barge service
  - CWAT (Ice Roads)

Minimum Wind Chills (°F)
Monday through 7:30 AM

Howard Pass (RAWS)	-91	Barter Island	-68
Deadhorse	-83	Anaktuvuk Pass	-68
Nuiqsut	-78	Point Lay	-65
Kuparuk	-74	Cape Lisburne	-58
Alpine	-70	Point Hope	-57

ASTAC serving area

All Villages Fiber to the Home	
Year	% Complete
2023-2026	100.0%



ASTAC's Service Area

ASTAC's service area - Point Hope to Kaktovik
90,000+ square miles, which is larger than
40 of the 50 states.

ASTAC

Risk Map and Permits

Land Use Agreements

- ASRC
- Atqasuk Corporation
- BLM
- UIC

Construction Permits

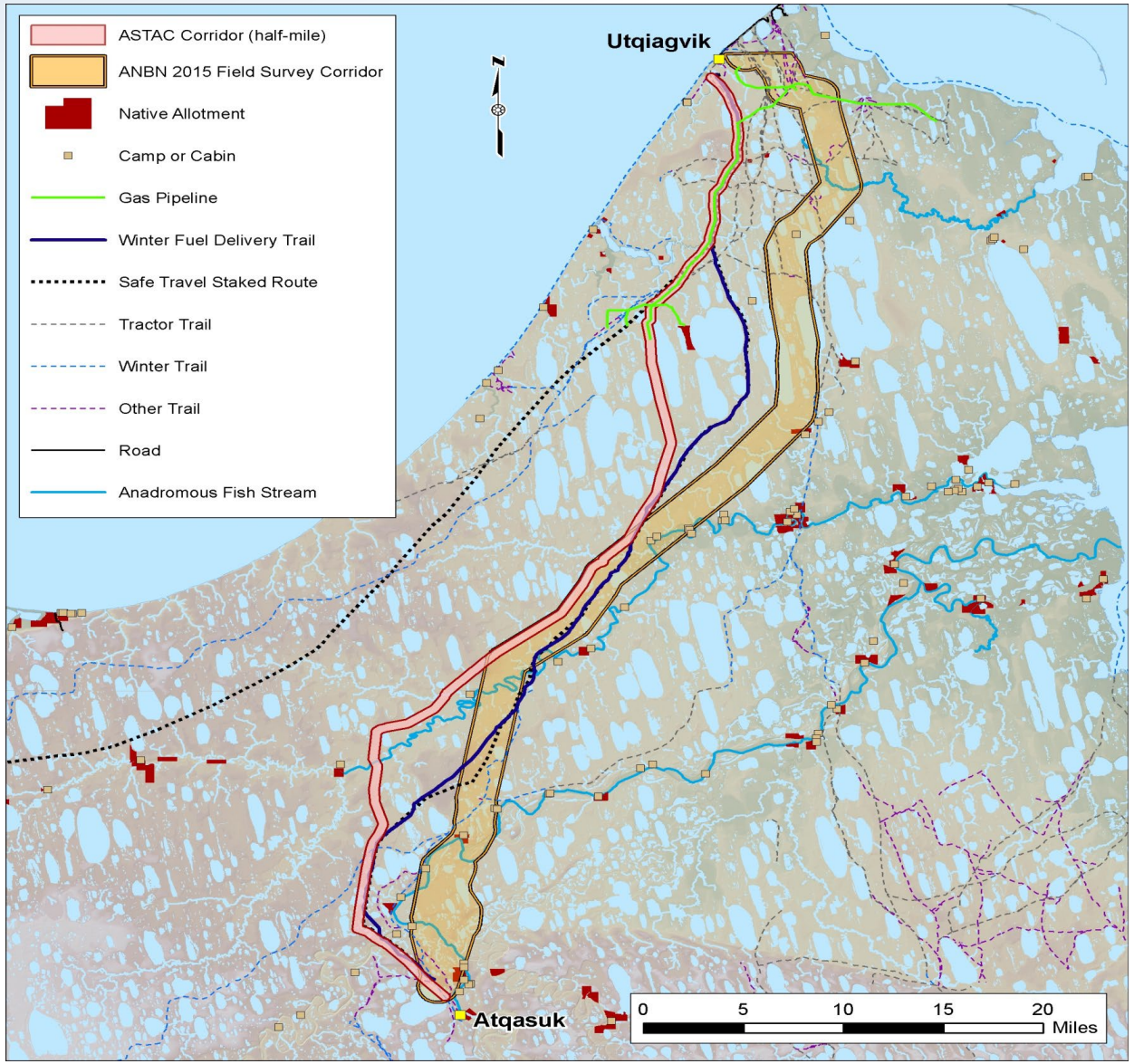
- ASRC
- Atqasuk Corporation construction permit
- BLM Right of Way
- NSB construction
- USACE (for river crossing)
- UIC LNO

Community Winter Access Trail (CWAT) Permits

- ASRC
- BLM CWAT/ROW
- DNR
- NSB

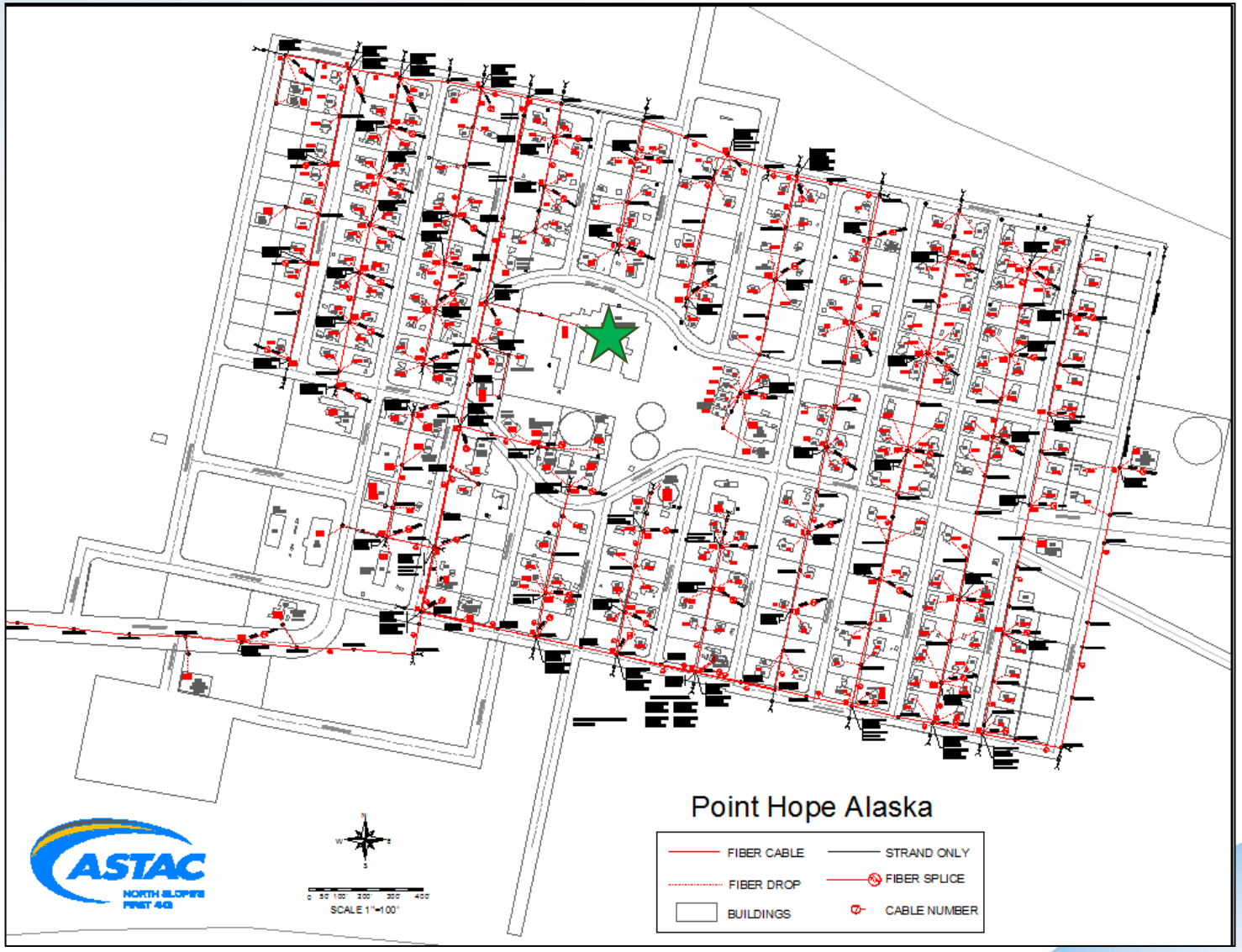
CWAT LNOs

- Emerald House, LLC
- Great Bear Pantheon
- Oil Search Alaska

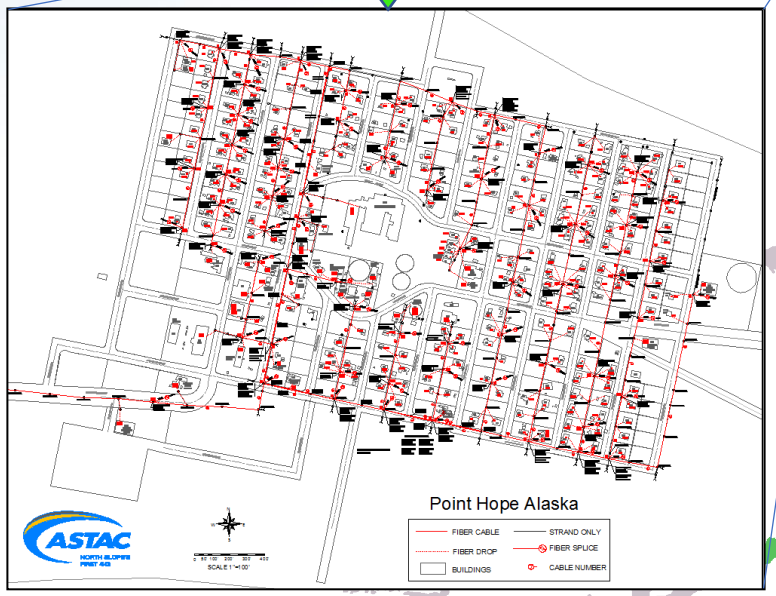


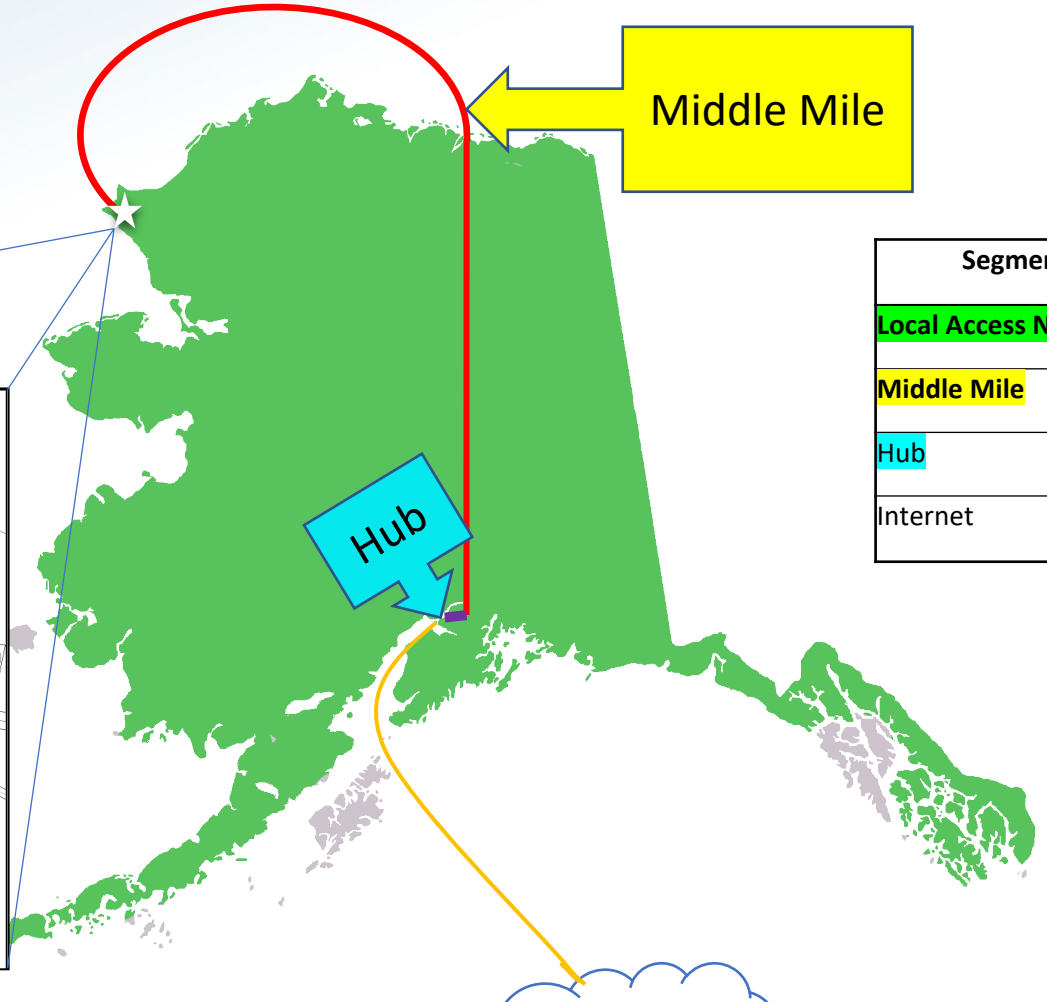
Innovations

What it Empowers:
North Slope Borough School District -- Remote Desk



Challenges – Middle Mile Costs





Segment	% of Costs
Local Access Network	9%
Middle Mile	83%
Hub	6%
Internet	2%

ASTAC
NORTH SLOPE'S FIRST 4G

Lesson's Learned

1. Have a detailed plan for initial build and financial sustainability

2. Partner early and often

3. Always ask is there a more effective and efficient way

4. Be patient

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Questions

Capex vs. Opex (Why Opex support is needed)

Example: Two hop Microwave between Utqiagvik and Atqasuk (~70 Miles) Total transport ~5 Gbps

Key Elements and ROM CapEx costs:

- Engineering and Permitting = $400K
- 3 towers = $1.33M ea., $4M total
- 1 remote prime powered mid-point site (twin generators, fuel tank, pad) = $500K (4 year life)
- Microwave Equipment (2 hops, diverse antennas) = $500K (5 year life)
- Power additions (far ends) = $100K

Total Year 1 Capex Spend = **$5.5M**

20 Year Capex Spend = **$7.0M**

Annual Operating Expenses, not including middle mile capacity:

- Fueling of mid-point site = $120,000
- Generator maintenance (Oil changes, filters, failover testing) = $12K
- Tower light testing, licensing, site maintenance, Etc. : $3K
- Transport to site for all operations activities = $45K

Total Annual Opex cost: **$180,000**

20 Year Opex cost: **$3.6M**

Annual Middle Mile Capacity Annual Opex Cost:

3Gbps Subsea bandwidth: **$5.4M**

20 Year Middle Mile Opex: **$108M**