

Alaska's Internet Access Grows – New Connectivity Options for Rural Alaska



PACIFIC DATAPORT

May 2023 | Pacific Dataport, Inc. | Anchorage, Alaska

Building On Our Experience ...



PACIFIC DATAPORT

Created by...



Partnering with...



About Pacific Dataport Inc. - Pacific Dataport Inc. (PDI) is a satellite middle mile provider headquartered in Anchorage, Alaska. PDI was founded “by Alaskans, for Alaskans” to enable Internet access for everyone, everywhere in Alaska. PDI is focused on providing affordable middle mile and last mile broadband using the newest satellite technology from the Aurora and OneWeb Networks. PDI clients include telecoms (wired & wireless), non-profits, hospitals, clinics, schools, libraries, governments (Tribal, local, state & federal) and Alaska Native Corporations, Villages, Tribes and Tribal consortiums.

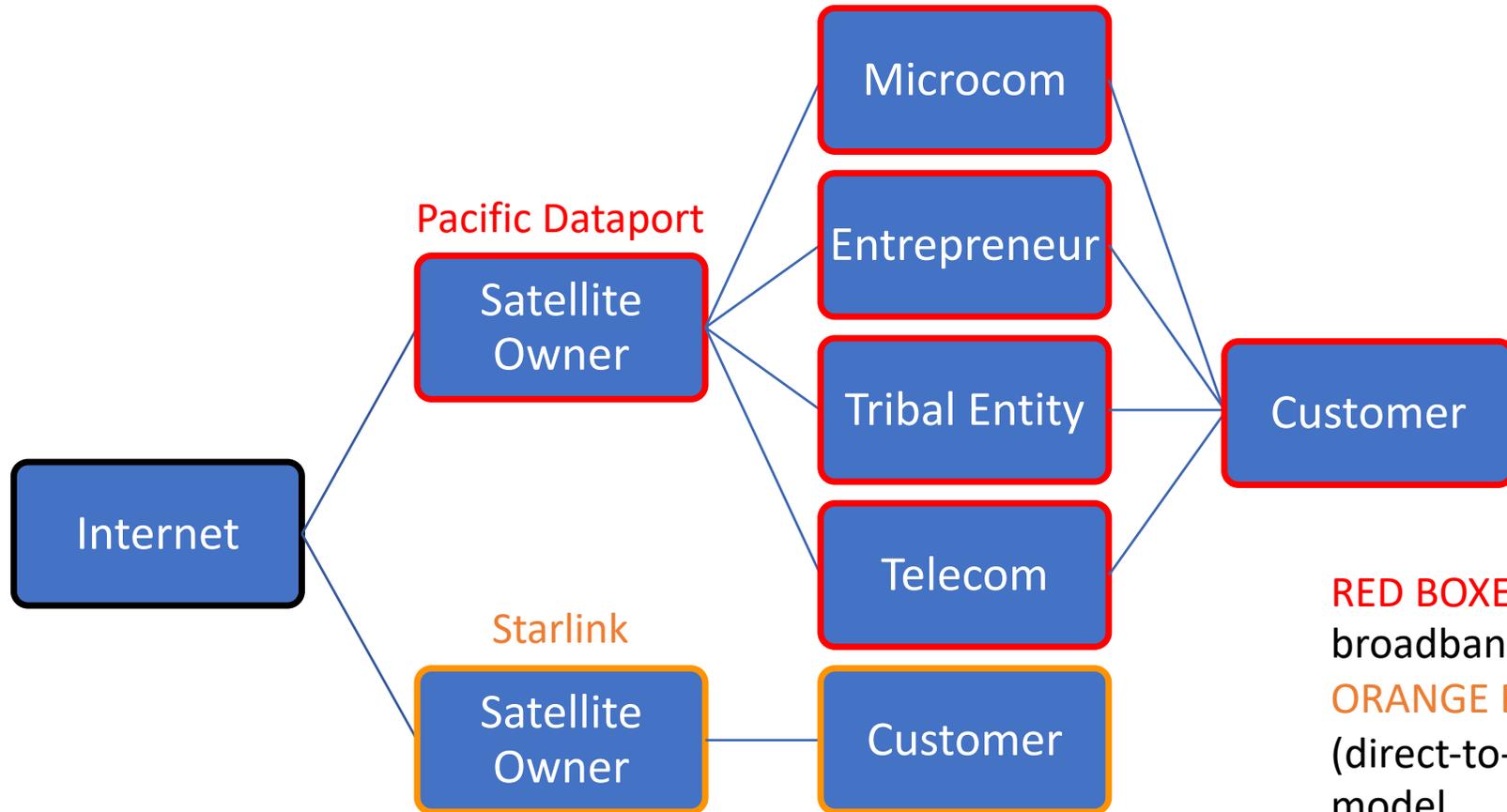
Last Mile and Middle Mile

DEFINITIONS:

- Internet (global backbone infrastructure)
- Broadband (connectivity including 25X3 and faster)
- 2.5 GHz Tribal Spectrum (Issued by the FCC)
- WISP (Wireless Internet Service Provider)
- Last Mile (community connection to the home)
- Middle Mile (Lower 48 Internet to community – could be fiber, microwave or satellite)

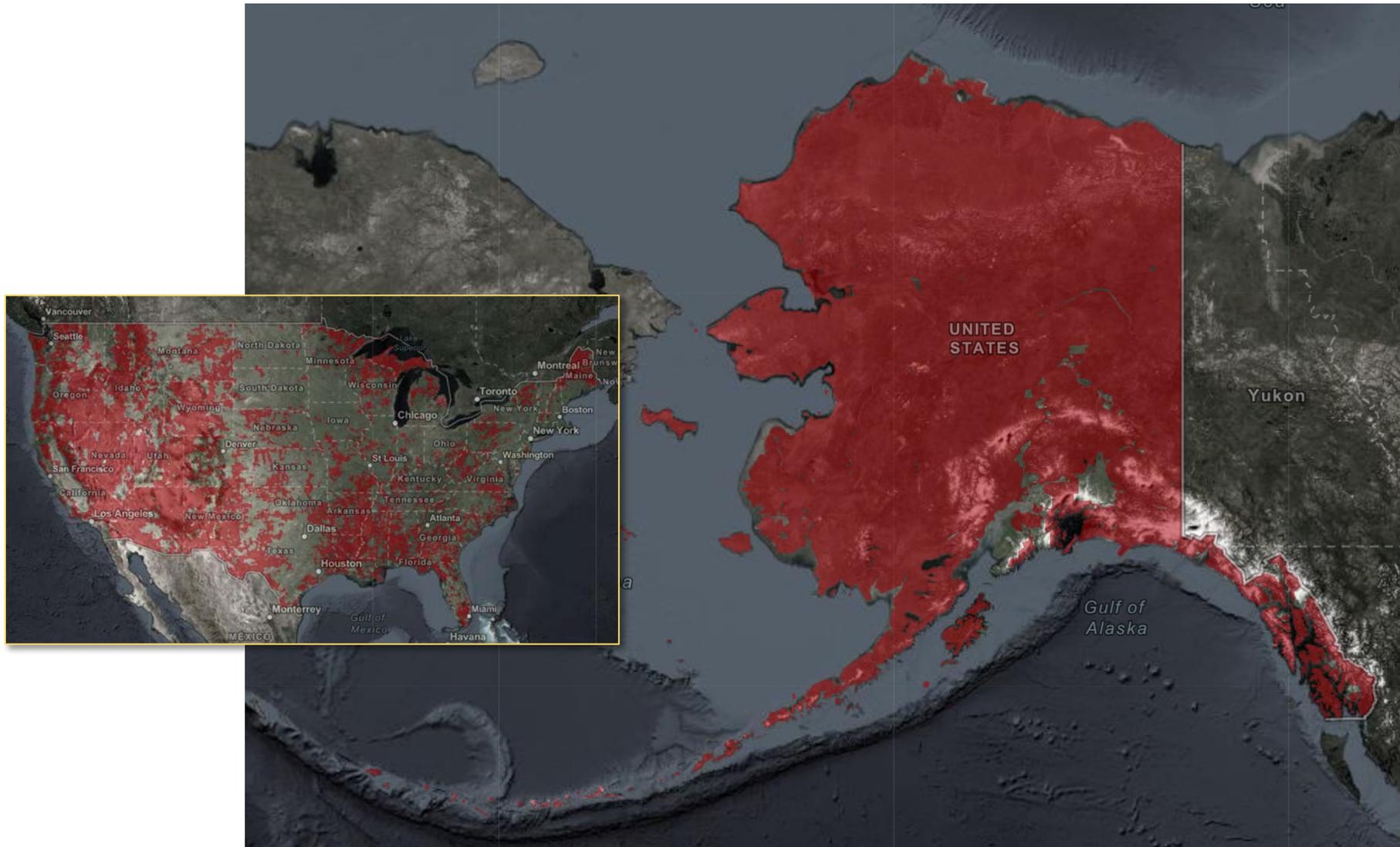


Internet to Customer Path



RED BOXES indicate middle mile broadband business model.
ORANGE BOXES indicate DTC (direct-to-consumer) business model.

Alaska's Digital Divide in 2022



[Indicators of Broadband Need Map - FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps \(Census Block Level\)](#)

Retrieved August 18, 2021 from <https://broadbandusa.ntia.doc.gov/resources/data-and-mapping>

Today's Alaska Broadband Facts

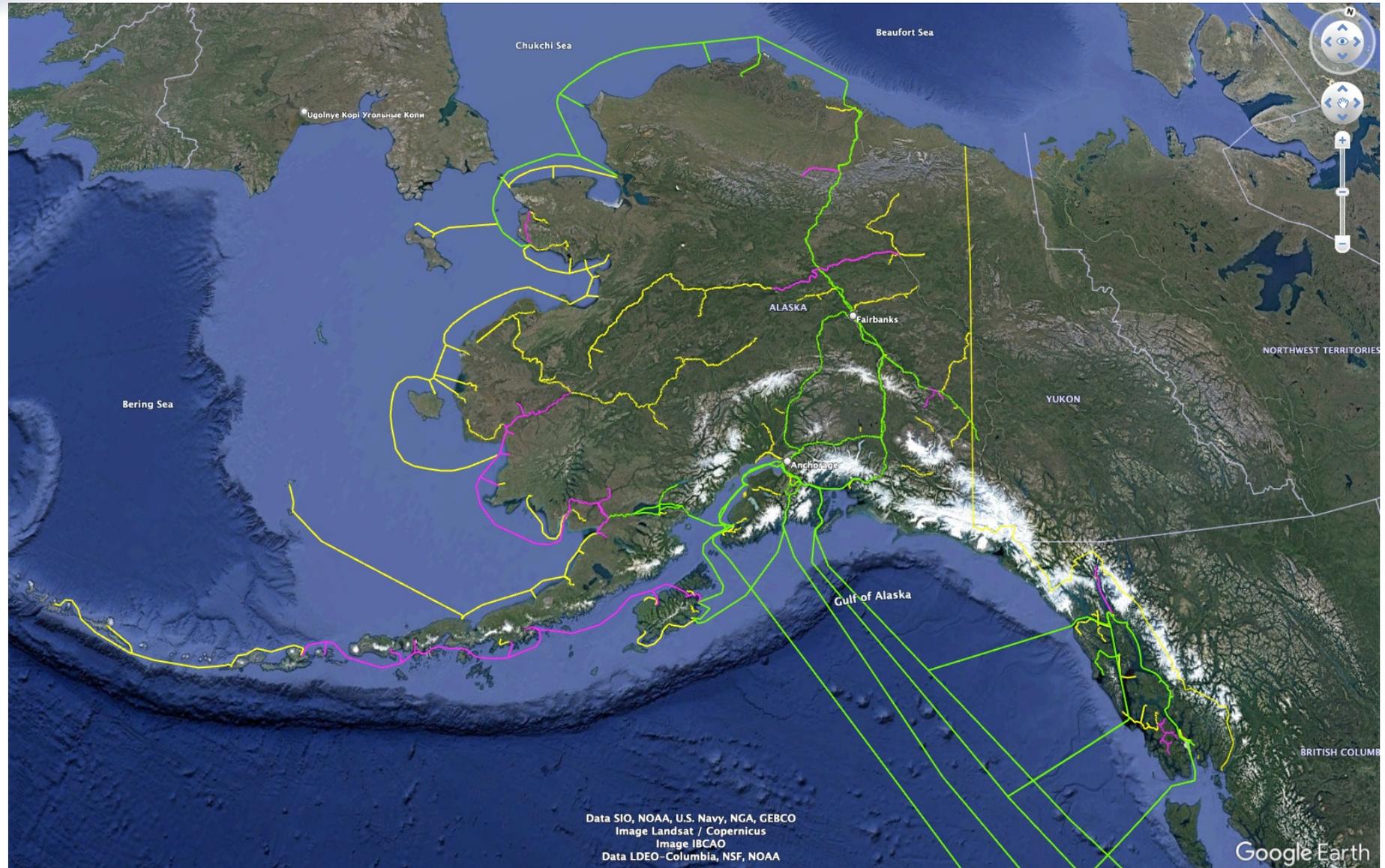
- 36.3% of rural Alaskans still have no wired broadband (25X3 or faster) connection* (242 Communities)
- There is currently NO long-term plan to reach the 150 unserved and underserved communities in rural Alaska
- No rural Alaska school meets the FCC's educational goals of 1 Mbps per student
- Anchorage pays ~\$.24 for a GB of data – Adak pays ~\$22.22 (before Starlink)
- Even where a fiber runs down the middle of the road, residents are often bypassed as potential customers (this is called digital red-lining)
- Off the Northern coast of Alaska, 25X3 fiber broadband service is offered at \$299 per month.
- Rural Alaska schools often pay \$40,000 to \$60,000 per month for 25X3 service (each school)
- Approximately 242 rural Alaska locations are unserved (no internet) or underserved (less than 25X3)



Before broadband was delivered to their homes, kids hang-out near the school in Akiak, Alaska to access wireless internet through their phones. Courtesy of Katie Basile/KYUK

* Retrieved from "[FCC FOURTEENTH BROADBAND DEPLOYMENT REPORT](#)" issued 1.19.21, page 57

- Universal Broadband Network (yellow)
- Existing Fiber (green)
- Newly awarded Fiber (pink)



Courtesy of the Alaska
Broadband Office

OneWeb Network

- LEO Satellite
- Statewide Coverage
- Operational Now



Aurora Phase I – Aurora 4A

- ~7.5 Gbps
- GEO HTS Satellite
- Statewide Coverage
- Operational Q3 2023



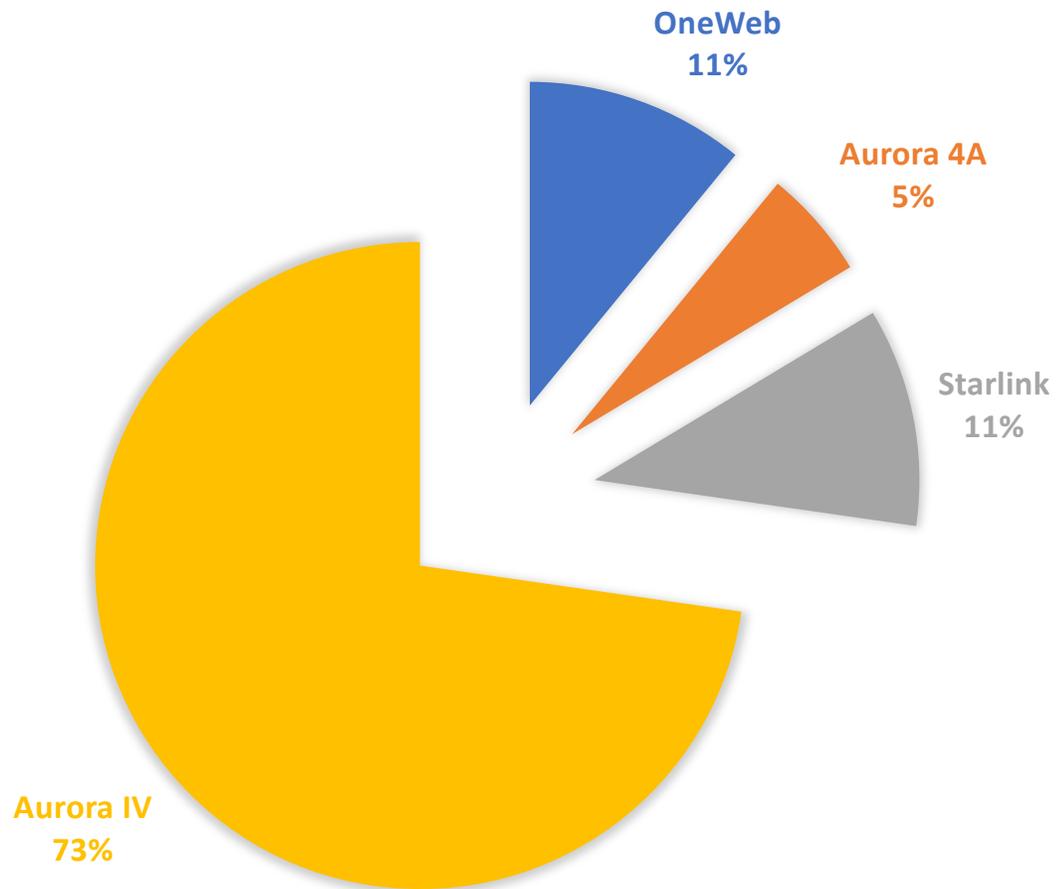
Aurora Phase 2 – Aurora IV

- ~100+ Gbps
- GEO VHTS Satellite
- Statewide Coverage
- Operational Q4 2024



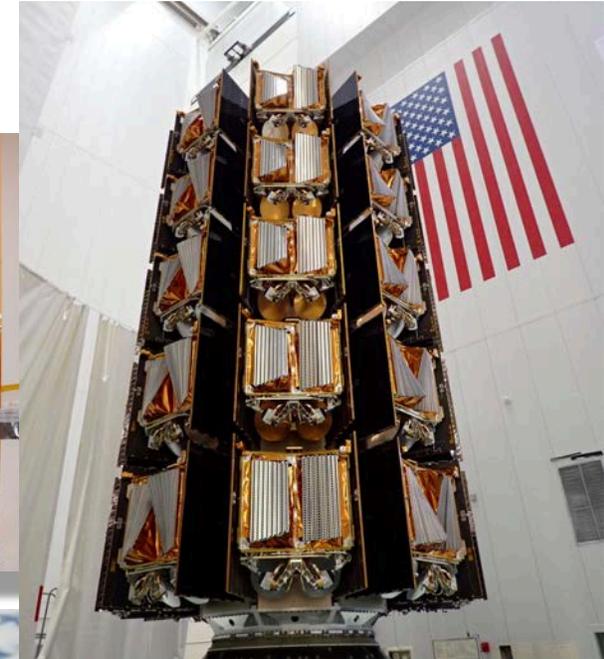
More Affordable, Sooner Deployment & No Additional Subsidies Needed

SATELLITE CAPACITY NEEDED TO SERVE ALL OF RURAL ALASKA'S UNSERVED/UNDERSERVED (~140 GBPS)





- Internet access everywhere, for everyone!
- 648 satellites (48 spares)
- ~1,200 km altitude
- 18 orbital planes, 36 satellites in each plane
- Low latency solution, <100ms
- Speeds up to 100Mbps download and 20Mbps upload per satellite terminal
- Pacific Dataport is a OneWeb distribution partner for Alaska

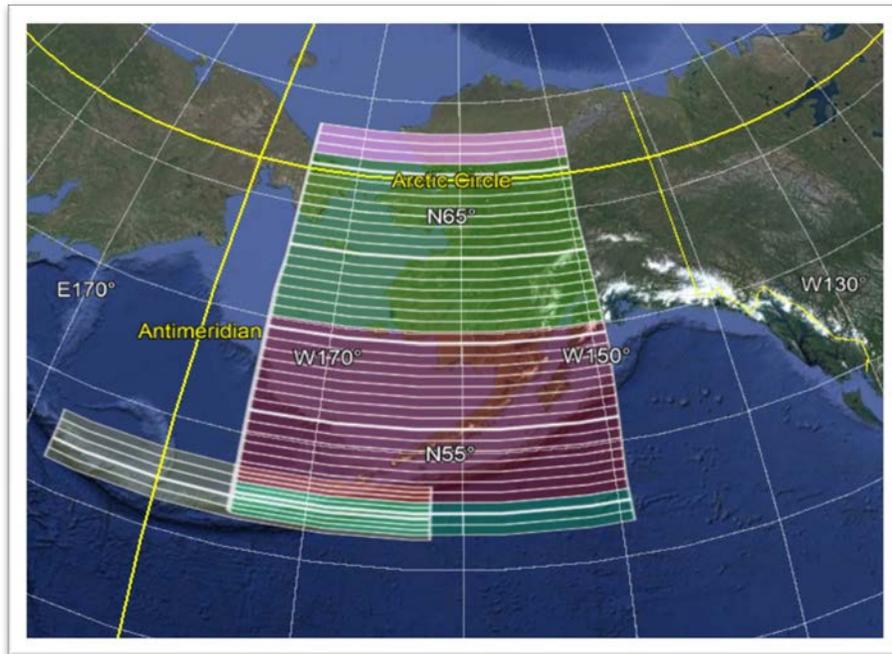


OneWeb Satellite Beam Pattern

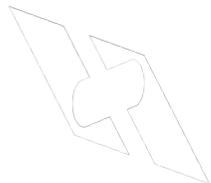
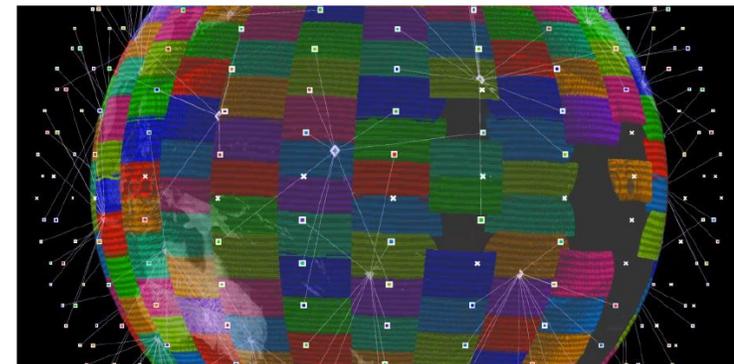


Satellite Beam Pattern

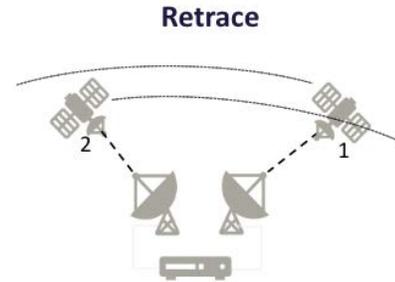
- Each satellite has 16 user beams, arranged in a “venetian blind” pattern
- The “footprint” of each satellite overlaps slightly with adjacent satellite footprints to create gapless coverage
- Forward: Each beam contains a single forward link carrier with 250MHz of occupied bandwidth
- Reverse: Each beam contains six reverse link carriers of 20MHz each, and 125MHz of total occupied bandwidth



Global Satellite Beam Coverage



UT Antenna Configurations



- One antenna of the Dual Parabolic UT retraces while another carries active service traffic.
- Compact-ESA has single antenna but retraces fast.
- Service switches from one satellite to another after the antenna retrace
- Satellites involved in the service switch could be of the same plane (intra-plan switch) or different planes (inter-plane switch)



Dual Parabolic



Electronic Steerable Antenna (ESA)

Kymeta's Hawk u8 OneWeb LEO Terminal

Antenna Variations:

- Fixed Locations
- Moving Land Vehicles
- Moving Marine Vessels
- Moving Aircraft

“With the vast unmet demands for ubiquitous broadband and growth in portable and mobile communications requirements across major industries globally, Kymeta and OneWeb’s partnership aims to fill these needs. Kymeta user terminals are available for fixed applications and will soon be available for communications on the move for land and sea.”

~ OneWeb & Kymeta Press Release





Talkeetna Alaska Teleport

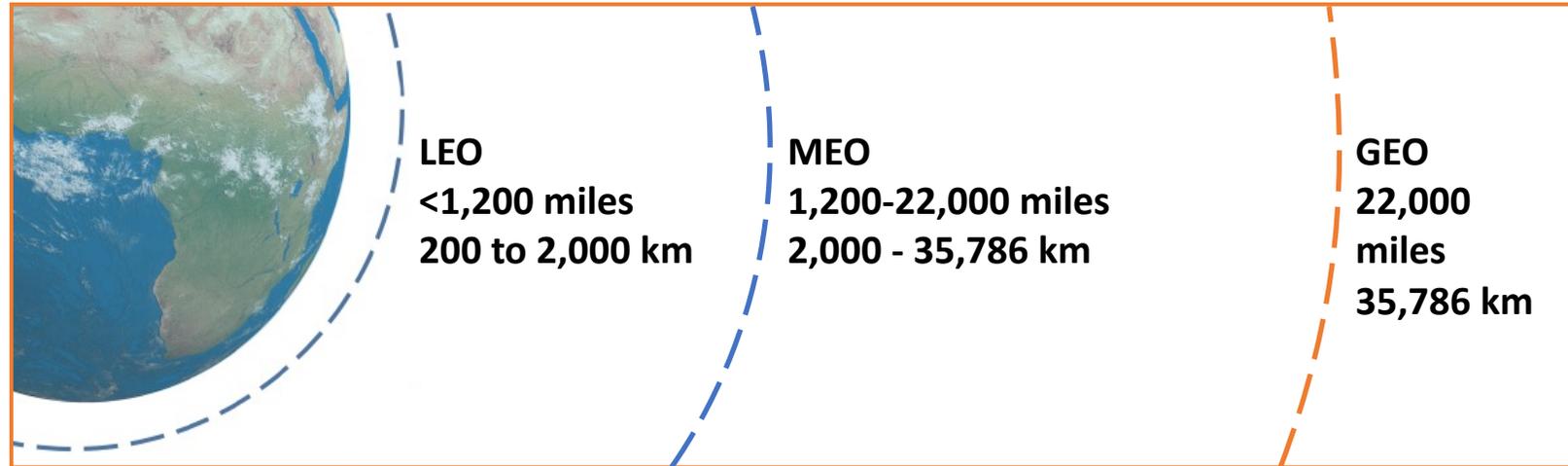


- First Customer: OneWeb’s Alaska Satellite Network Portal (SNP)
- 90 Acre Site developed in 2019
- Able to host multiple gateway clients
- Statewide reach
- Redundant fiber connectivity
- Back-up generator power





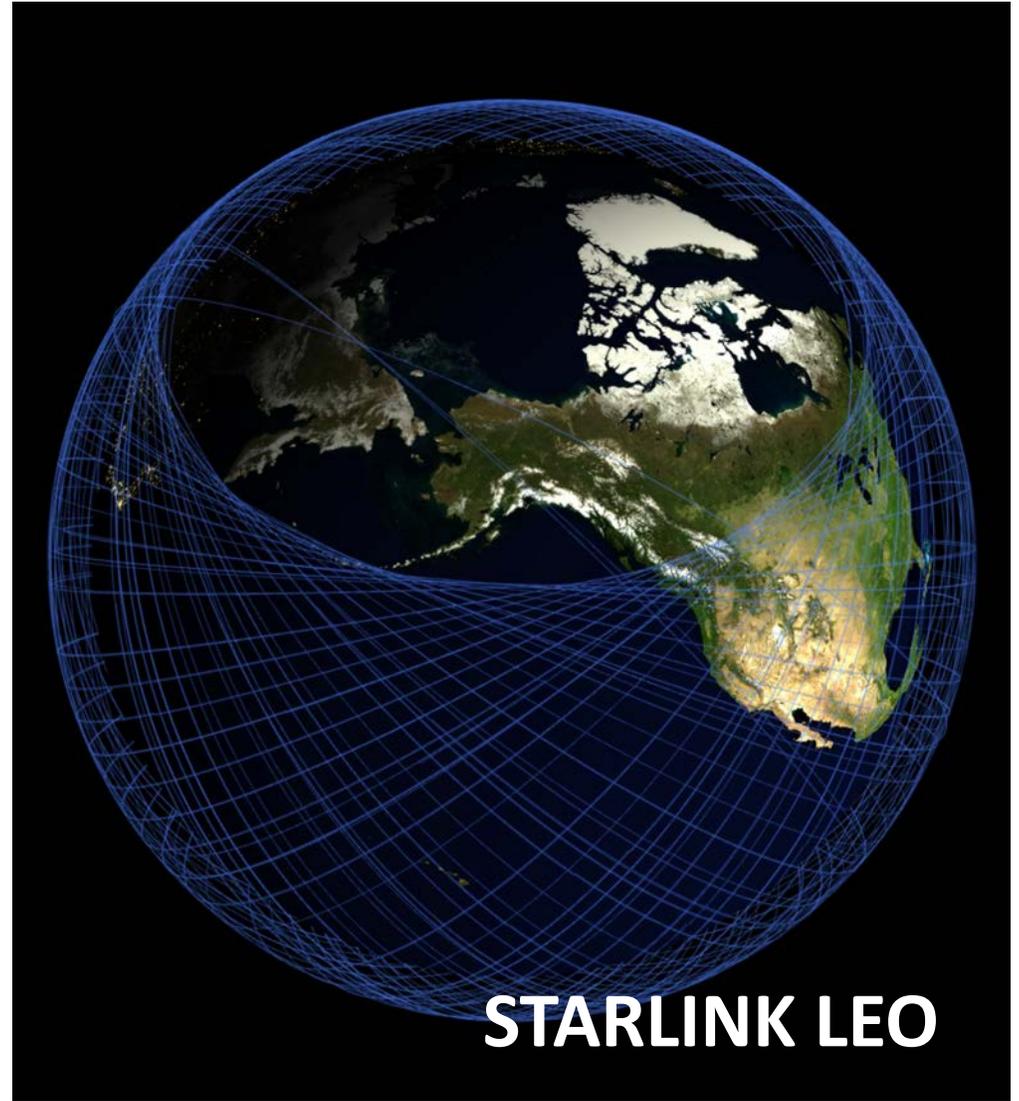
LEO Satellite Projects



LEO Network	Date Available	Reported Speeds	Reported Latency
OneWeb (mm)	Now	up to 100/20	65-200 ms
Starlink (SpaceX, dtc)	Now	up to 180/20	65-200 ms
Kuiper (Amazon, dtc)	Unknown	Unknown	Unknown
Lightspeed (Telesat, mm)	Unknown	Unknown	Unknown
Galaxy Space (China, dtc)	Unknown	Unknown	Unknown

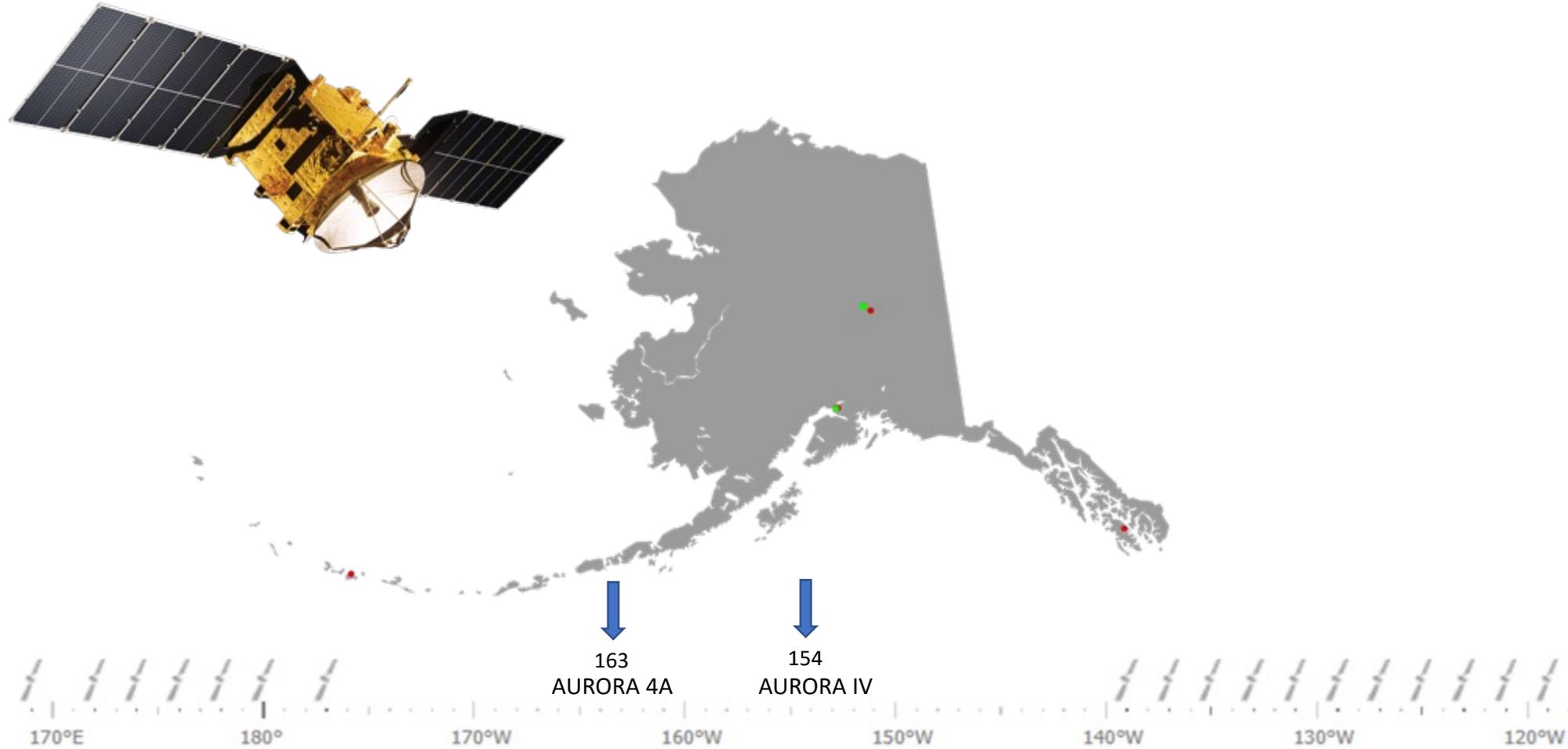


LEO Satellite Projects

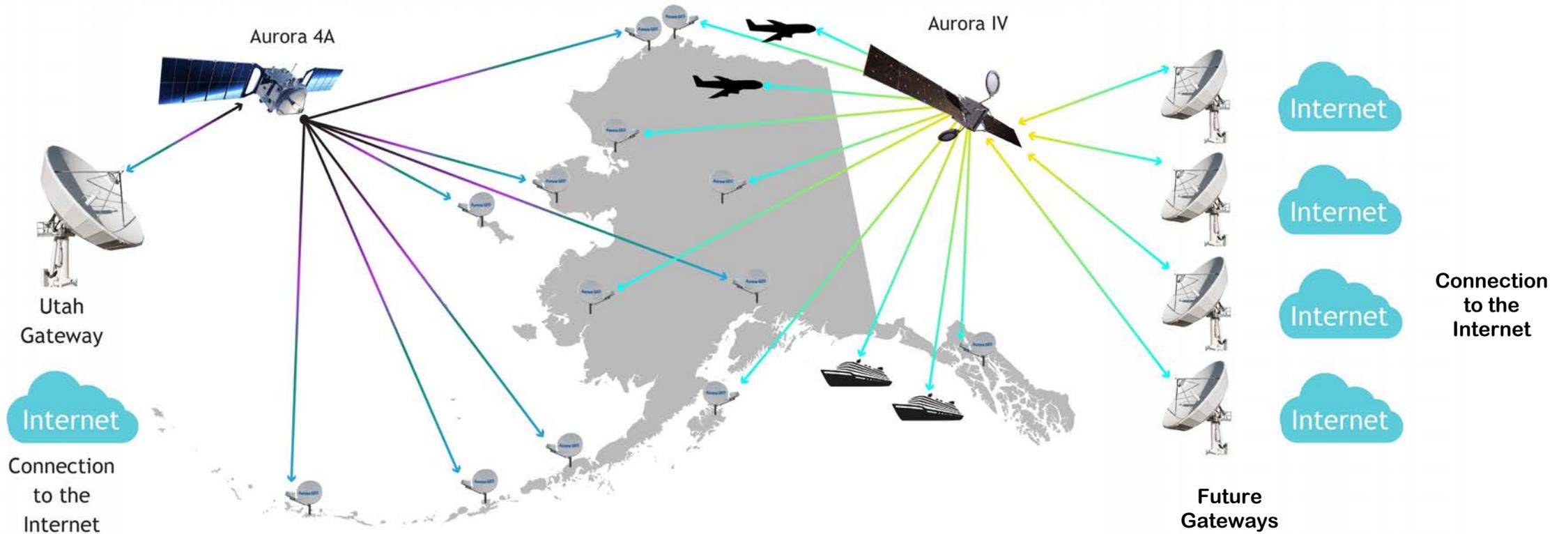




Aurora GEO HTS Network Orbital Slots



Aurora GEO HTS Network Coverage



Aurora Project Satellite Capacity Comparison



New Technology

- High Speed and high capacity
- Direct Connection to the Internet (Layer 3)
- Ka-Band

(1) Aurora 4A



=

(5.2) Ku Satellites



=

(11.5) C Band Satellites

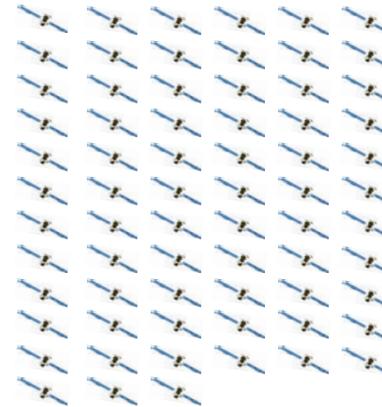


(1) Aurora IV



=

(69) Ku Satellites



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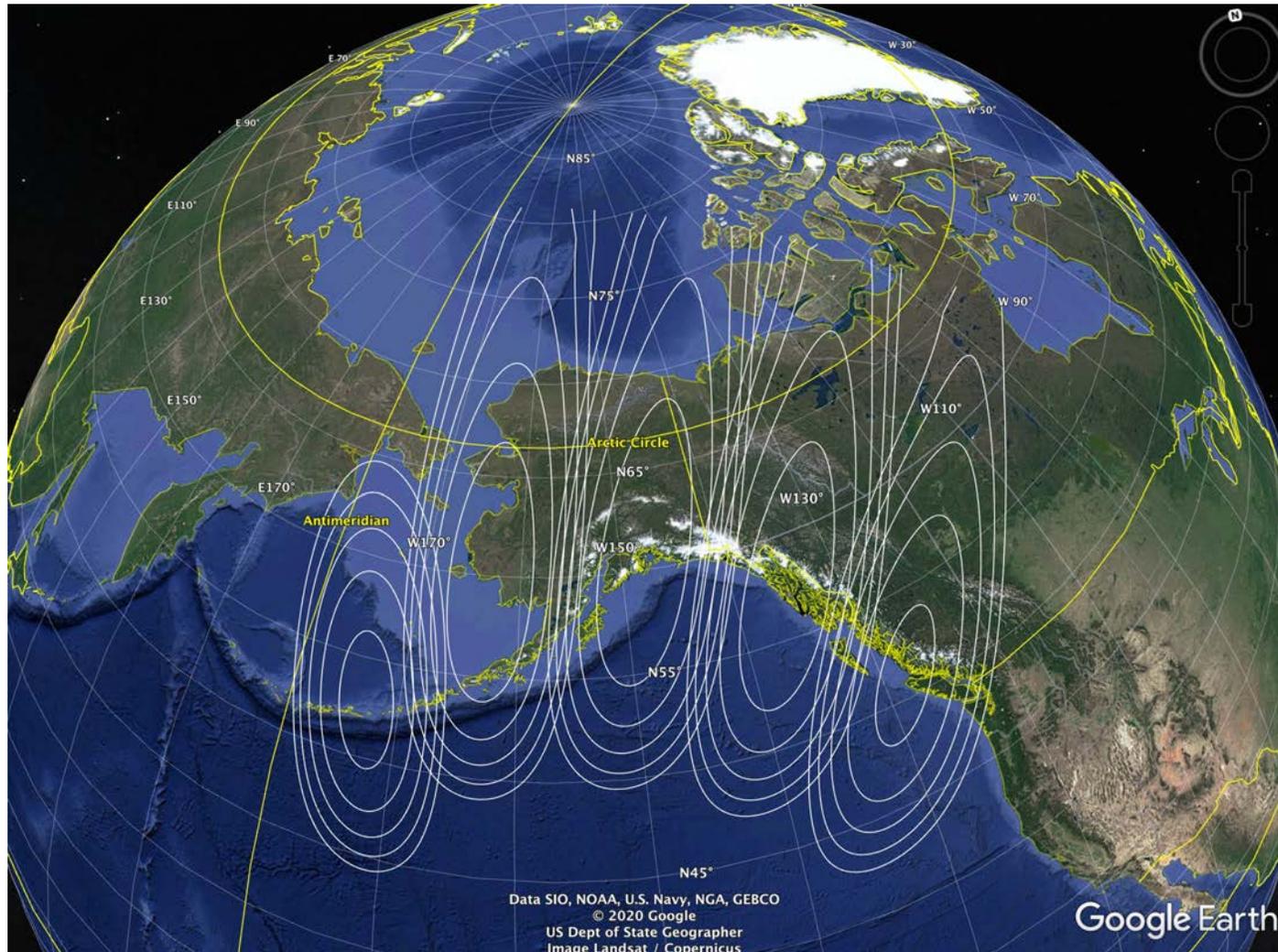
(153) C Band Satellites



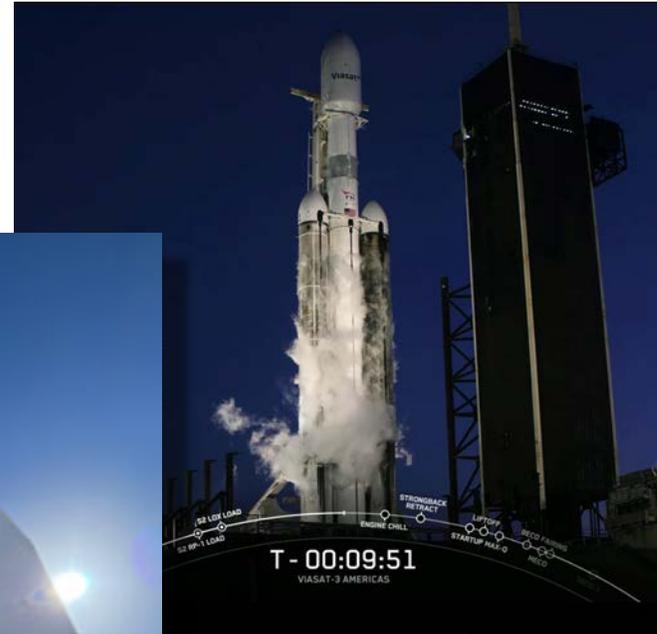
Comparison is based on the following technical capacity parameters.

Aurora 4A = 7.5 Gbps (7,500 Mbps) • Aurora IV = 100 Gbps (100,000 Mbps) • Ku Satellite = 1.448 Gbps (1,448 Mbps) • C Band Satellite = .650 Gbps (650 Mbps).

AURORA 4A GEO HTS Alaska Coverage



Aurora 4A Launches - April 30, 2023

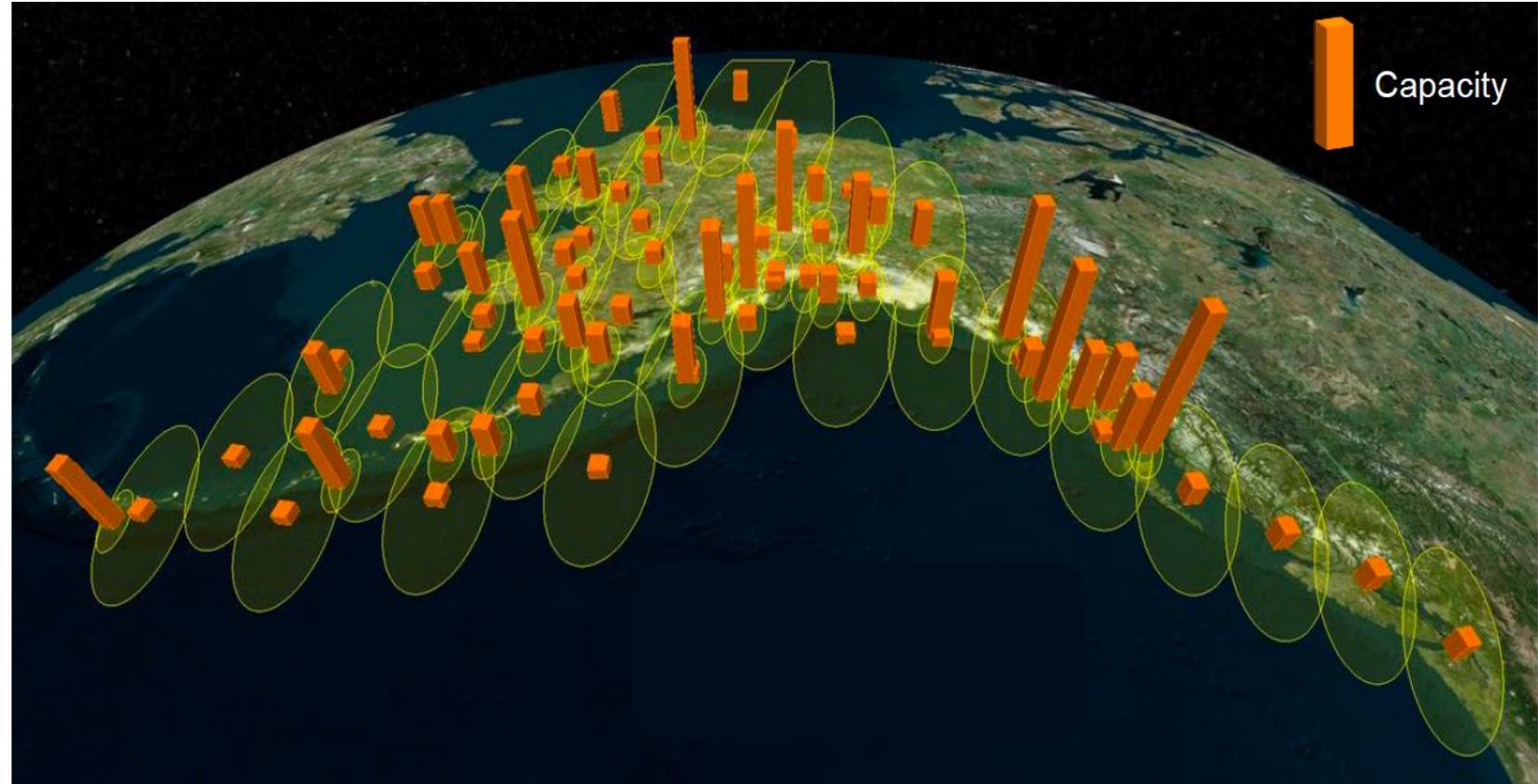


- ✓ Satellite built in California
- ✓ Gateway built in Utah
- ✓ Rocket launched in Florida
- ✓ Satellite in its orbital slot
- ✓ RF Engineers communicating
 - Alpha testing (3 weeks)
 - Beta testing (7 weeks)
 - Commercial service on or before August 1, 2023



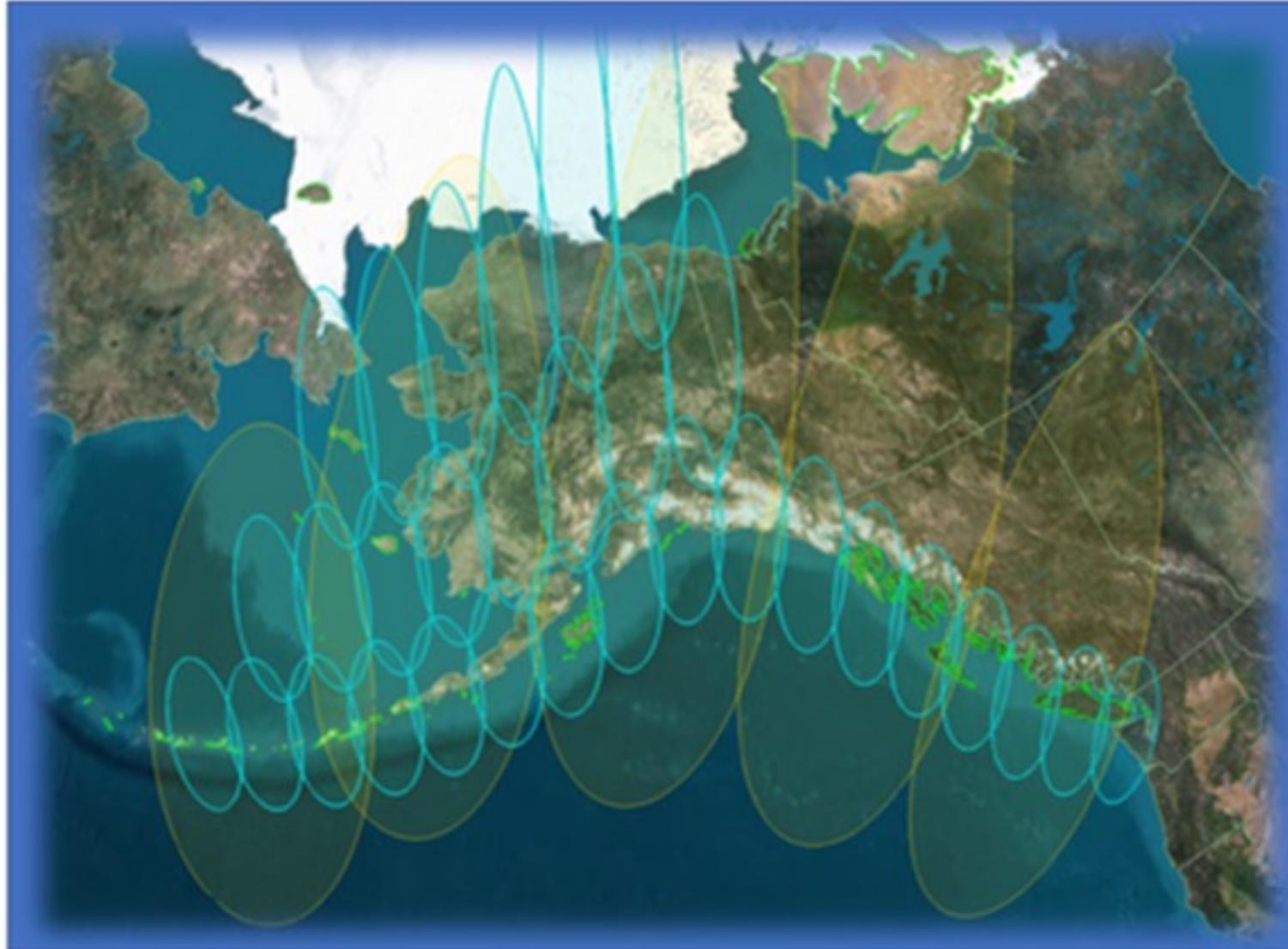
Aurora IV Optimized for Rural Alaska

- Capacity ~110+ Gbps
- Dynamic Beam Coverage
- Enables a target retail price of \$99
- Multi-satellite system offers redundancy and diversity
- Expansion capacity as needed



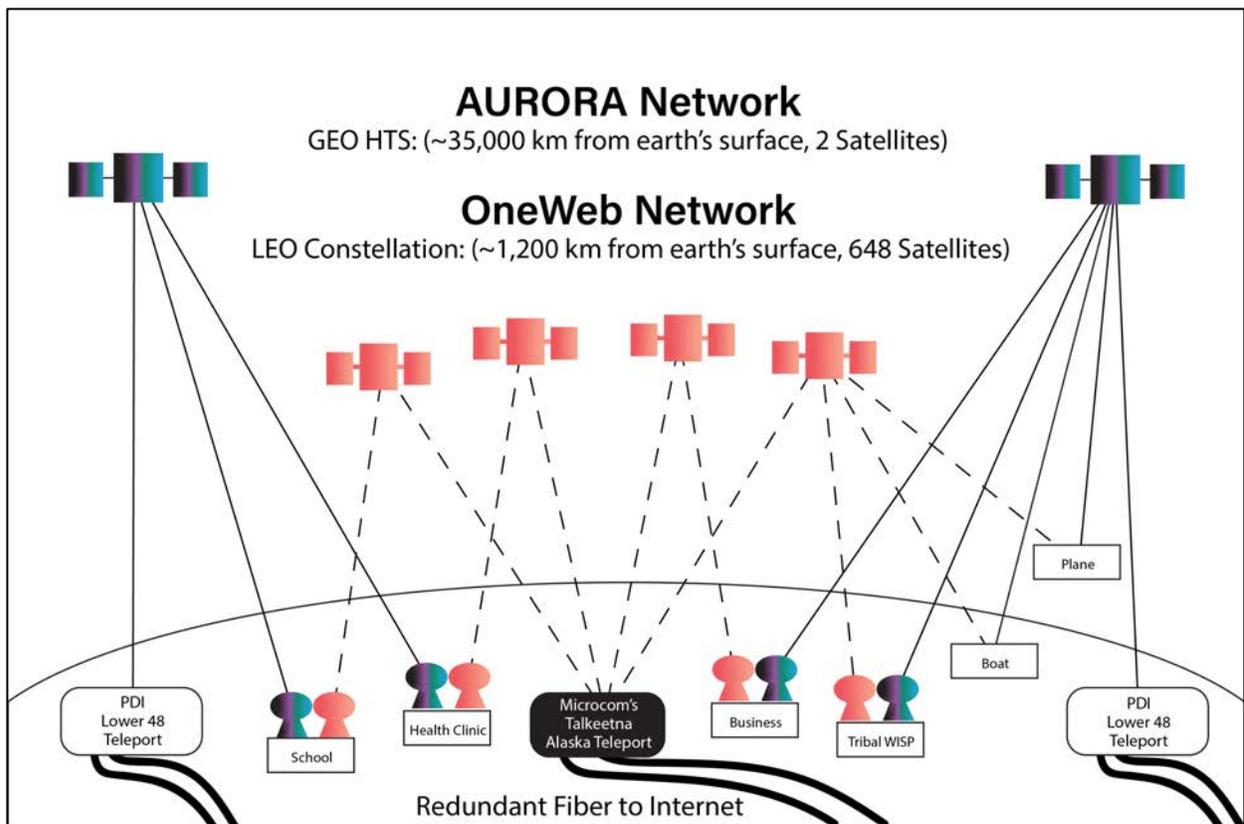


Aurora Network Optimized for Rural Alaska

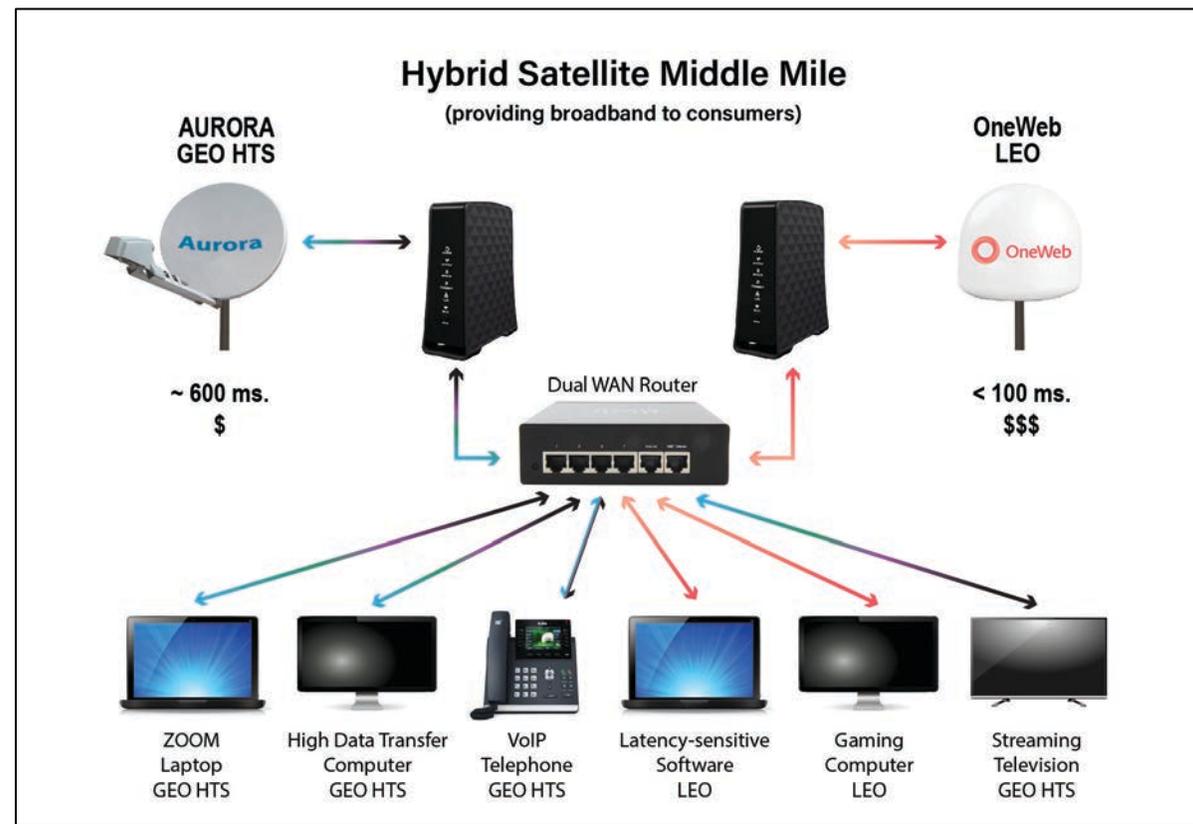


Aurora GEO HTS/ OneWeb LEO Hybrid

... from Space



... on the Ground



Thank you!

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Shawn Williams is the VP of Government Affairs and Strategy for Pacific Dataport in Anchorage. He's a 40-year resident of Alaska and former Assistant Commissioner of Commerce for the State of Alaska. Shawn is a member of the Karuk Tribe of California, earned a BA in Economics at the University of Alaska, Anchorage and an Executive MBA in Strategic Leadership at Alaska Pacific University.