



Broadband Task Force

July 17, 2019

City Background

- Population – 62,000
- Operated Electric Utility since 1900
 - 29,235 Accounts
- Built first fiber connections in 1999
 - Limited City and County Sites
- Network Expansion in 2002 - 2004
 - 96 Strands on 3 rings
 - Some for city use then leased out additional

Current Network

- Debt Free with an asset value of \$3,567,075
- Leased pairs to:
 - College of Eastern Idaho, Idaho National Lab, School District, Syringa Networks, Qwk Net, Silver Star, Bonneville County, Safelink Wireless, Direct Communications, Blackfoot Communications, Sumo Rise Broadband, Melaleuca.
- Over 500 business locations on original fiber network
- Leased Pairs cost \$1,340 per month, \$25 Per drop location

2018 Network Expansion

- Open Access expansion with new “lit” network
- Motivation
 - Enable access to affordable high speed broadband throughout the city
- Principles of operation
 - Continue public private partnerships with providers
 - Enable customer choice
 - Bring down the costs for ISP’s operating on network as well as customers connected to network
 - “Build one road with multiple users”

CITY OF 
Ammmon
FIBER OPTICS
 when the media matters.



Open Access Infrastructure Provider

Internet Packages:

15/15Mbps \$16.50 per month

1Gbps \$26.50 per month

- 2009 – Publicly declared Broadband an essential service cared for by municipal utility
- 2010 – Ordinance clarified purpose to ‘create an infrastructure’ to serve: City, public safety, public, anchor, businesses, residents
<https://ilsr.org/rule/3131-2/>
- 2011 – Started construction to connect City properties to support operations
- 2011 – Started leasing dark fiber to carriers in support of 4G wireless
- 2012 – One of founding ‘smart communities’ to join US Ignite (smart city accelerator)
- 2012 – NSF sub-award ‘Network Slicing for Emergency Communications’
https://www.nsf.gov/awardsearch/showAward?AWD_ID=1258486
- 2013 – Entered into ‘Joint Powers’ agreement with the local public school district improving options while saving thousands monthly
- 2014 – Started providing layer 2 lit circuit carrier transport
- 2014 – NIJ Ultra-High Speed Apps Challenge 1st place winner
<https://nij.gov/funding/pages/fy13-ultra-high-speed-apps-challenge.aspx>
- 2015 – Founding member of Next Century Cities (core principals)
<https://nextcenturycities.org/about/overview/>
- 2016 – Created first LID in support of infrastructure build out to all addresses wanting fiber (utility option for property owners)
<https://muninetworks.org/content/ammons-local-improvement-district-gets-city-council-blessing>
- 2016 – National Association of Telecommunications Officers and Advisors: Community Broadband Project of the Year
https://www.natoa.org/web/site_news/news_detail/34
- 2016 – NSF sub-award ‘Public Safety through a Municipal Software Defined Infrastructure’
https://www.nsf.gov/awardsearch/showAward?AWD_ID=1647264
- 2017 – Ammon hosts official launch of automated open access model, Harvard University releases Berkman Klein research
https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3047420_code727672.pdf?abstractid=3047420&mirid=1
- 2017 – 2018 – Broadband Communities ‘Top 100 Leaders and Innovators in FTTH’ 2 years running
<https://bbcmag.epubxp.com/i/1007867-jul-2018/32?m4=>
- 2018 – FCC Chairman Ajit Pai visits
<https://www.idahostatesman.com/opinion/readers-opinion/article213995624.html>
- 2018 – Consumer Product of the Year award from the Idaho Technology Council
<http://www.idahotechcouncil.org/hall-of-fame-2018/>
- 2019 – Bonneville County Emergency Communications Center failover site
- 2019 – Free Internet becomes a reality in the Ammon open market system
https://www.theregister.co.uk/2019/06/07/ammon_municipal_broadband/









Ammon
FIBER OPTICS
SERVING THE GREAT SALT LAKES

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Ammon
FIBER OPTICS
SERVING THE GREAT SALT LAKES
Justin Hart

Ammon
FIBER OPTICS
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MOUNTAIN ADVENTURER
Ammon
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J. McBratney

Ammon
FIBER OPTICS
SERVING THE GREAT SALT LAKES
D. W.

Ammon
FIBER OPTICS
SERVING THE GREAT SALT LAKES
L. Smith

Ammon Results:

- \$4 million local investment
- 9 Full time employees
- NO municipal debt
- State of the art infrastructure
- Creation of an open marketplace
- 1Gbps Internet for \$26.50 month

Property Owner Results:

- Increase property value
- Decrease monthly expense
- Provide choice
- Access to previously unavailable
- Optional participation
- +85% would 'strongly recommend'

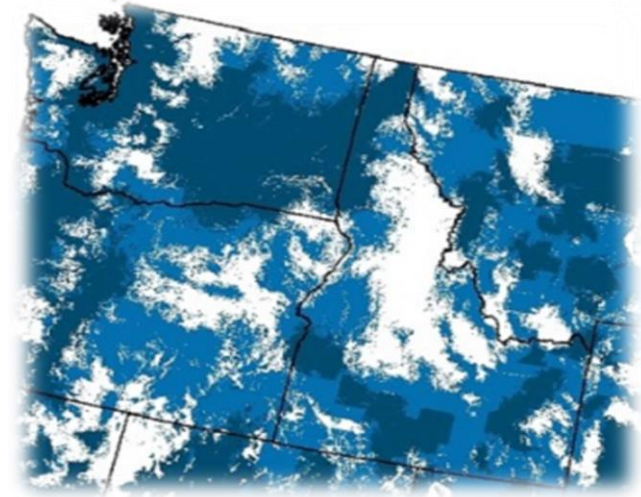
Recommendations:

- Focus on infrastructure
- Create framework supporting transitions
- Encourage local investment



Thank you





Broadband Task Force Information Brief

17 July 2019





Planning for FirstNet in Idaho

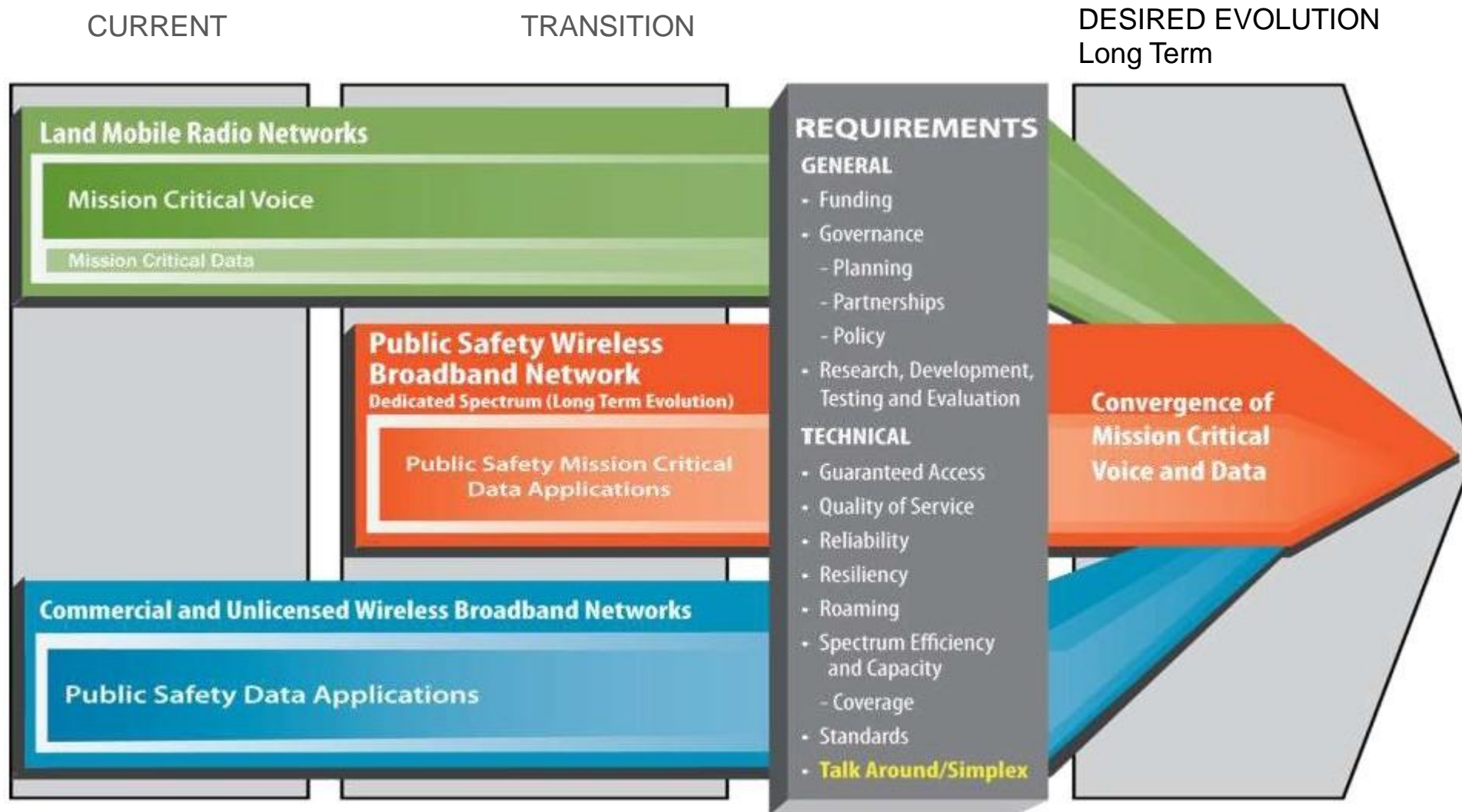


The Proposed Solution

- **Create next generation nationwide public safety wireless network**
- **Provide high data rates (“broadband”) to enable advanced applications**
- **Use industry standards to enable interoperability for public safety**
- **Adopt fourth generation (“4G”) cellular technology to leverage fast pace of commercial development**
- **Leverage commercial equipment economies of scale while maintaining public safety unique requirements**

**Nationwide Public Safety Broadband Network (NPSBN)
deploying Long Term Evolution (LTE)**

Planning for Convergence



Public Safety's Broadband allocation is **Band Class 14**

Agencies / Facilities / Critical Infrastructure

Agencies

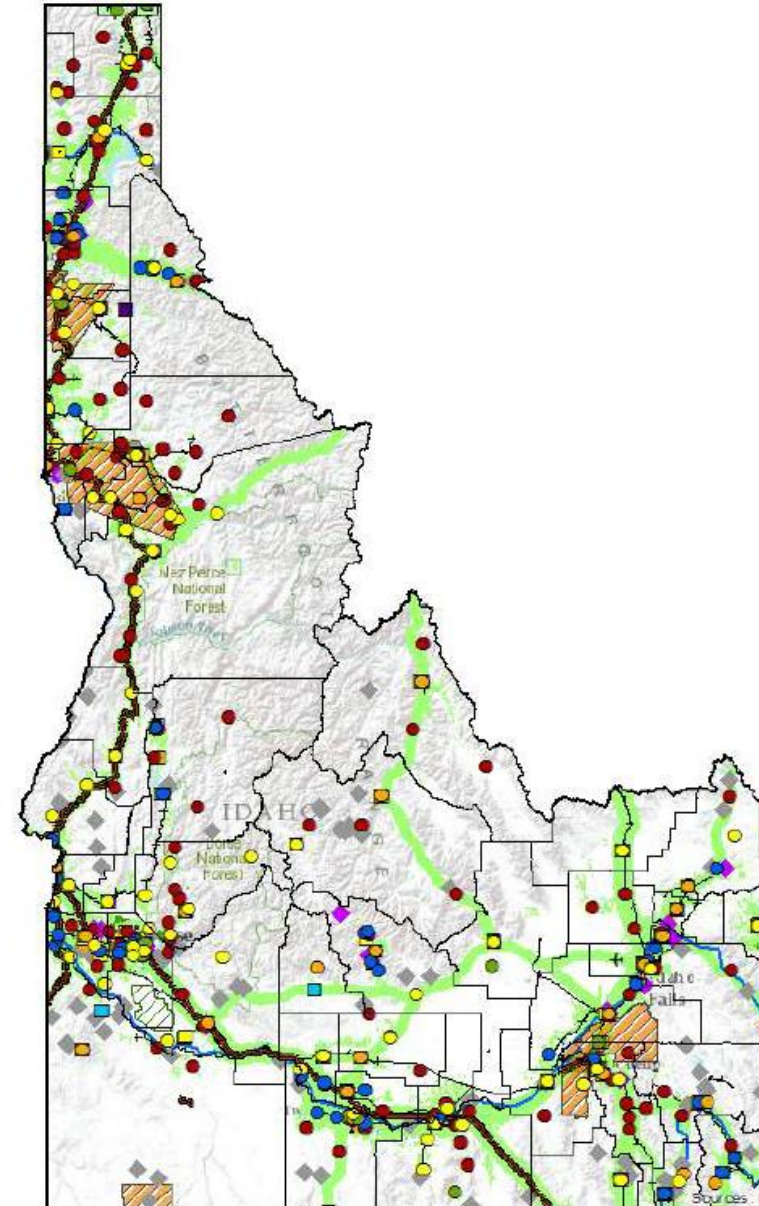
- EMS Departments
- Federal
- Military
- Emergency Management
- Law Enforcement
- Fire Departments

Facilities

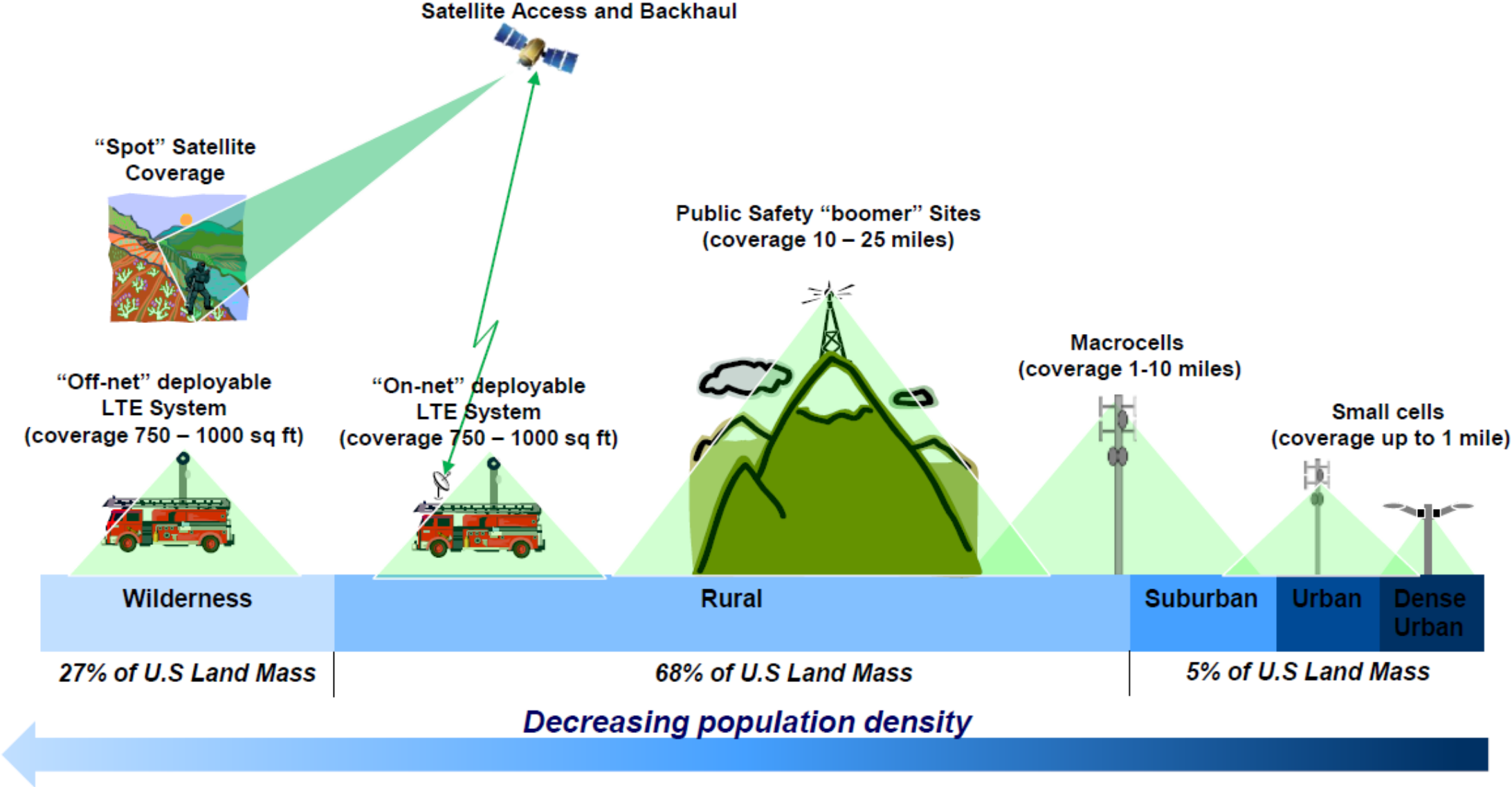
- Major State Government Building
- Court Houses
- ▨ Prison Areas
- ▨ Corrections
- ▨ Airport
- + Airports
- Local Emergency Operations Centers
- State Emergency Operation Centers
- Urgent Care Facilities
- Hospitals
- PSAP
- Schools
- ⚓ Ports
- Amtrak Stations
- Air National Guard (ANG) Sites
- ▨ Army National Guard (ARNG) Installations
- Canada and Mexico Border Crossings

Critical Infrastructure

- ◆ Manufacturing
- Hazardous Materials Routes
- ◆ Energy
- ☢ Nuclear Plants
- ◆ Dams
- ◆ Public Venues



RAN Deployment Solutions

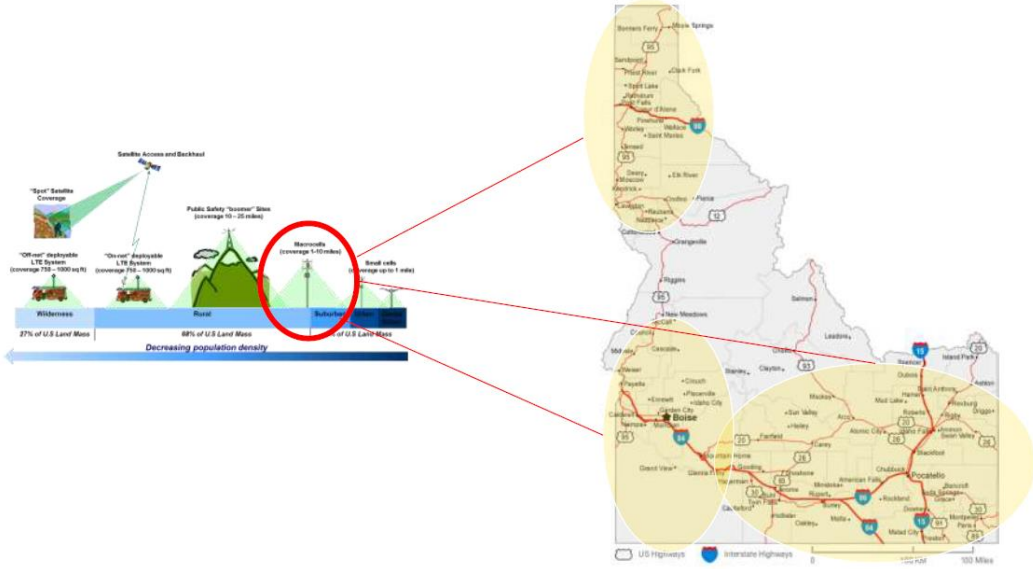


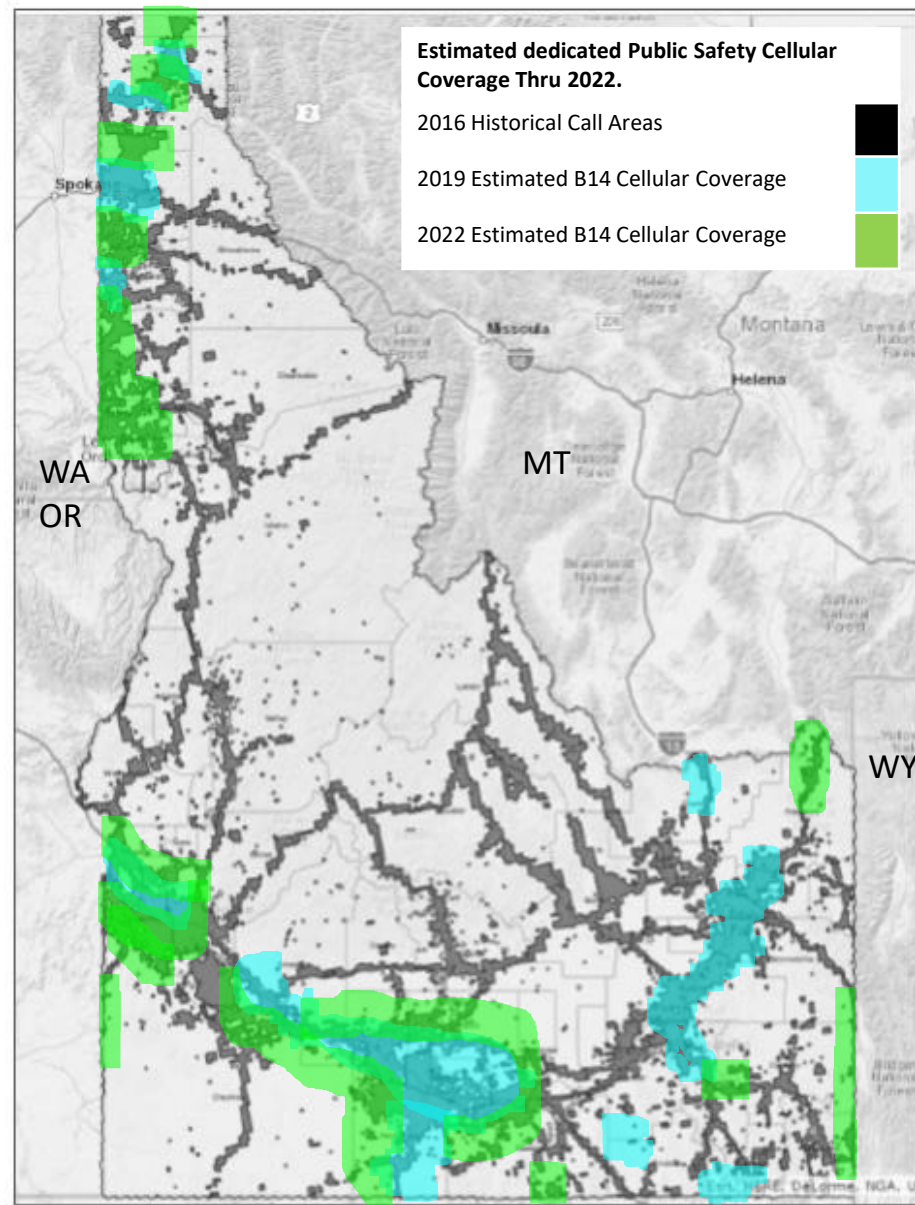
Small Cells & WiFi



Macrocells

Boomer Cells





- Coverage estimation represents potential Band Class 14 service (dedicated to Public Safety)
- Depicts terrestrial outdoor coverage only – NOT indoor or small cell deployables
- Assumed minimum data throughput is at least 768kbpsDL/256kbpsUL at -110dBm signal strength
- Assumed network will carry voice, data, and video
- Slide does NOT depict normal commercial 4GLTE nor ADV/PRO versions which will be available to public safety entities

Topics to be discussed

- Overview of current statewide and local broadband assets related to connectivity.
- Where do you currently provide service? – cities/facilities etc.
- Where do you currently NOT have or need additional service – cities/facilities etc?
- What types of speeds do you currently offer in your areas – up and down?
- Is your service exclusive or may it be used by others to help connect other users?
- If your service is exclusive, is there a timeline when it may not be exclusive?
- Who is your current ISP provider(s)?

THANK YOU

QUESTIONS?

ITD Fiber Connectivity Program



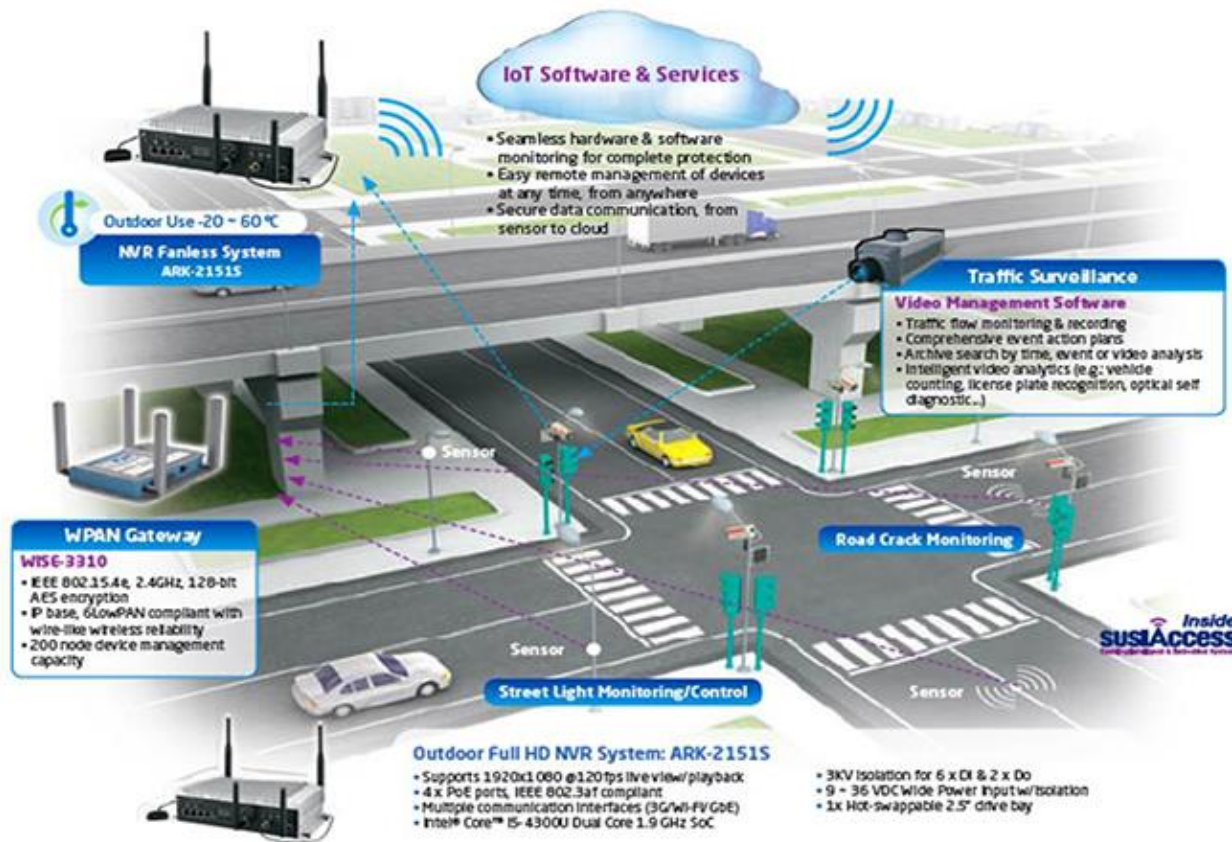
Transportation management for today...

...and tomorrow.



ITD's Challenge

- Managing the transportation network and the rapid pace of technological transformation.



Broadband Assets

- Owned infrastructure
 - ITD has conduit and fiber in locations throughout the state including Coeur d’Alene, Moscow, Lewiston, Boise, Twin Falls and Pocatello.
 - This includes purchased infrastructure as well as Master Shared Resource Agreements for broadband fiber strands
 - Everything else is through contract relationships for broadband services
- Gaps in infrastructure
 - ITD has gaps where there is less cost effective or non-existing infrastructure including Powell, Reeds Bar, Flemming, Kooski and Gibbinsville to name a few. Microwave or satellite options are used wherever possible at lower bandwidths
- This infrastructure is currently exclusive to ITD’s transportation network needs and the Safety of the traveling public.
- There are potential cooperation opportunities depending the recommendations of this task force.



Relevant Law

- I.C. §40-210 – Idaho Legislature states that the rights of way serve transportation and utility placement purposes
- ITD cannot pay for the relocation of any utility in its rights of way even if the need for relocation is pursuant to ITD action
 - This is prohibited by the Idaho Constitution
- Though I.C. §40-210 says that the ROW are for travel and utility placement, the needs of the traveling public take precedent. To that end ITD prioritizes Safety and Mobility considerations.



Current ITD Practices

- Master Shared Resource Agreements (In kind exchange)
 - Along Interstate, ITD has exchanged use of ROW and/or ITD conduit for fiber
 - For shared use of ITD conduit, ITD requires 48 strands of dark fiber
 - This practice has been employed at some other ITD ROW locations
 - With Fatbeam in Coeur d' Alene
 - With the Nez Perce Tribe near Lewiston
 - With Optix in Pocatello



Transmission and Rights of Way Options/Permitting





Broadband Deployment

Increased Road Safety

5G Networks

Potential State Revenue Generator



Rights of Way:

The future of Transportation and Telecommunications cooperation along the Transportation Network

Connected Vehicles

Intelligent Transportation Systems (ITS)

Autonomous Vehicles

Emergency Response Services

Bridging the Digital Divide To Underserved & Economically Disadvantaged Communities



Current Process

- Standard utility permit of \$50 – IDAPA 39.03.42.700.02.A and .C – Utility Rule sets the price.
- Applicant to complete ITD-2110 Right of Way Encroachment Application and Permit for Utilities
- Processing time is anticipated to take 2-4 weeks unless complicated by the intricacy of the project and completeness of required materials and documentation. (Forms, Maps, Construction Plans, Fees etc.)



FCC – Accelerating Wireless Broadband Deployment Order

- The Federal Communication Commission is a federal agency that regulates radio, television, and telephone industries
- The FCC’s oversight includes anything having to do with these industries, including the location of transmission/receiver locations
- This Order preempts state and local law, regulations, and polices for Small Cell/5G sites
- ITD is working towards compliance with the where, when & how aspects of this order. There are challenges.
- Successful states collaborate early in the planning stages with their transportation departments
- ITD stands to further the Governor’s vision through this broadband task force



Recommendations

- Identify state wide goals, policies, and procedures on handling 5G/fiber applications
- Review policies, guidelines, forms, etc. or potential improvements
- Disseminate and Educate on the handling of these issues
- Greater interface with other States regarding implementation, lessons learned, and best practices



IRON

IDAHO REGIONAL
OPTICAL NETWORK

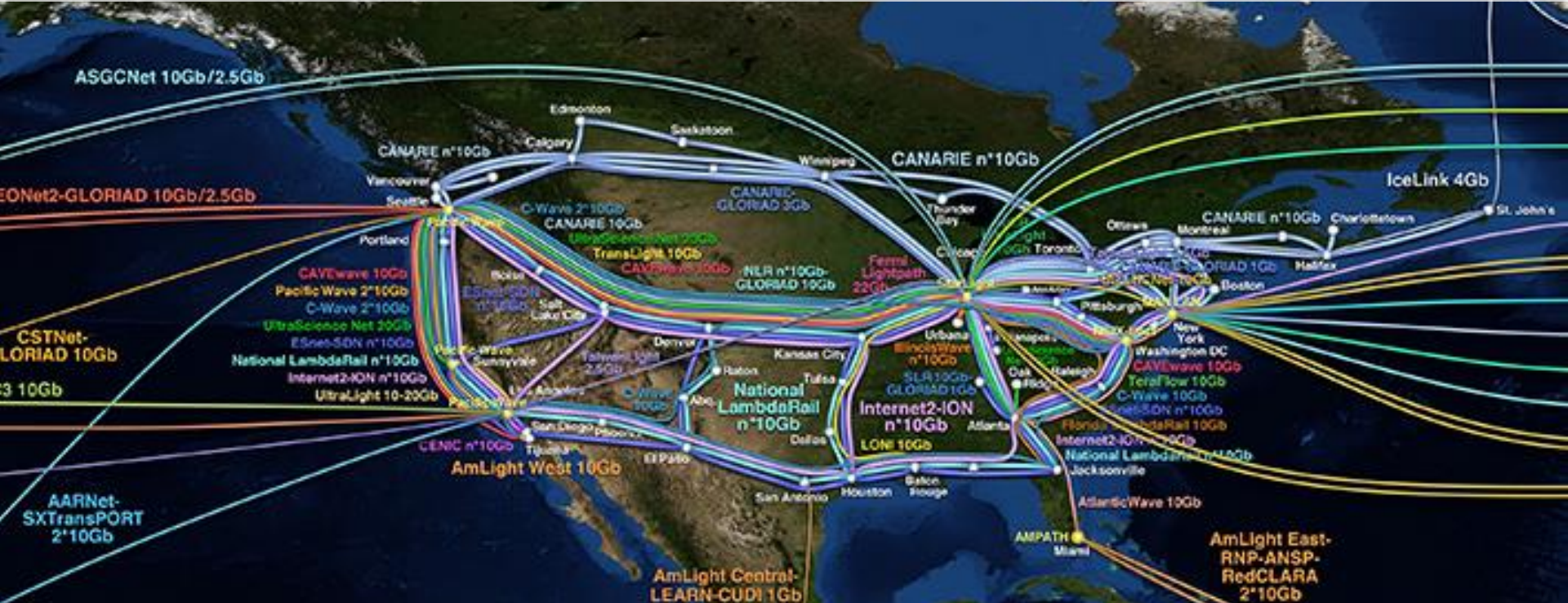


July 17, 2019

Brent J. Stacey, CEO and President

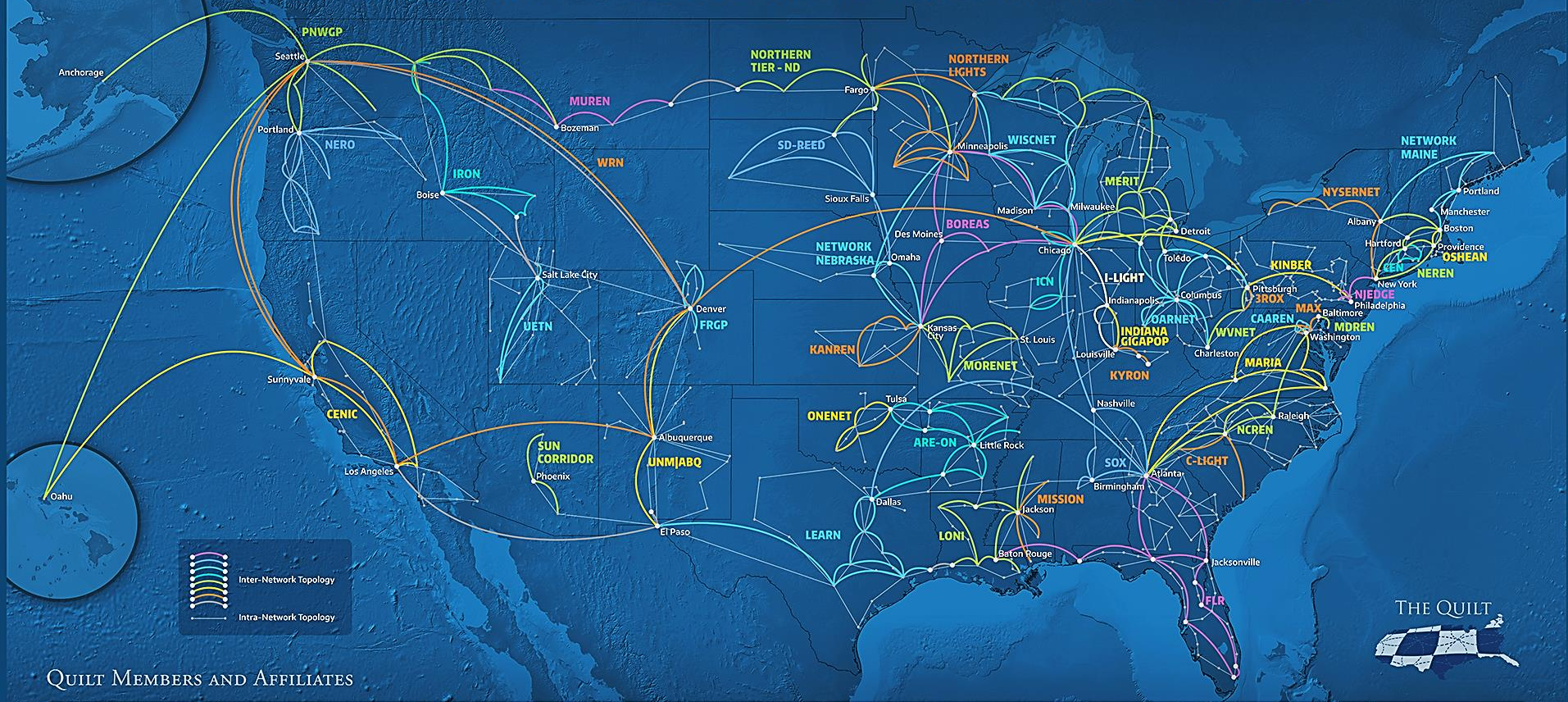
Regional Optical Networks (RONs)

RONs are research/education networks that act as principle aggregators of network traffic for the U.S. research and education community.



RONs play a critical role in the future of national advanced research and education.

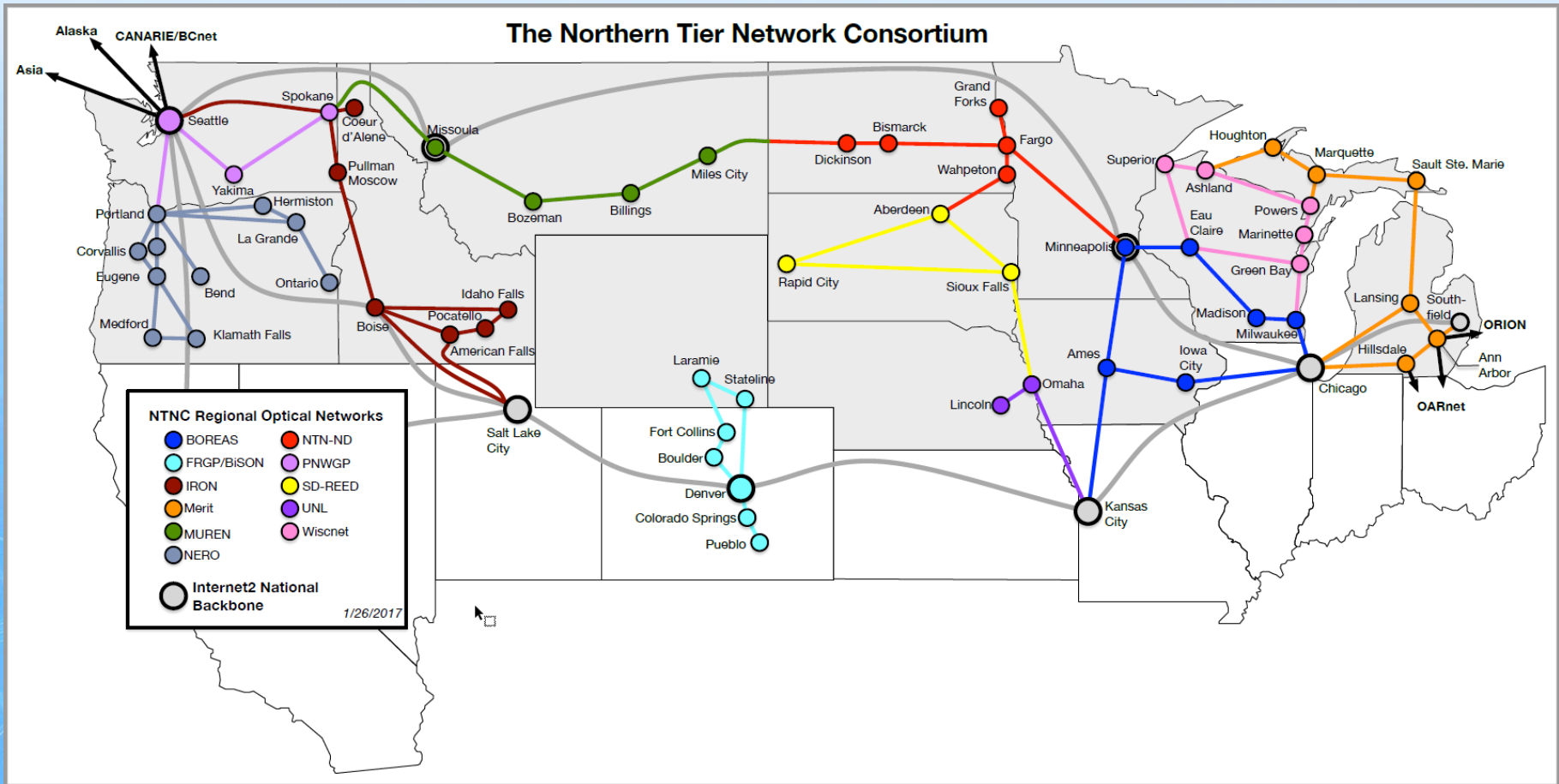
REGIONAL RESEARCH AND EDUCATION NETWORKS IN THE UNITED STATES



QUILT MEMBERS AND AFFILIATES



Northern Tier Network Consortium with IRON





Internet2 connects over 60,000 U.S. educational research, government, and community institutions—from primary and secondary schools to community colleges, universities, public libraries, museums, and healthcare.

Internet2's backbone was developed in 1995 by the National Science Foundation to create a faster alternative to the Internet and foster research and creativity.



Governor's authority to represent Idaho.

IRON Founding Members

University
of Idaho

Idaho State
UNIVERSITY

B
BOISE STATE
UNIVERSITY

BYU
IDAHO

Idaho **H**ospital
Association

INL
Idaho National
Laboratory

IDAHO
State of Idaho


WASHINGTON STATE
UNIVERSITY

Board of Directors

Max Davis Johnson, Boise State University

Stacey Carson, Idaho Hospital Association

Brent Stacey, Idaho National Laboratory

Dan Ewart, University of Idaho

Jeff Weak, State of Idaho

Joe Taylor, BYU- Idaho

Sasi Pillay, Washington State University

Scott Snyder, Idaho State University

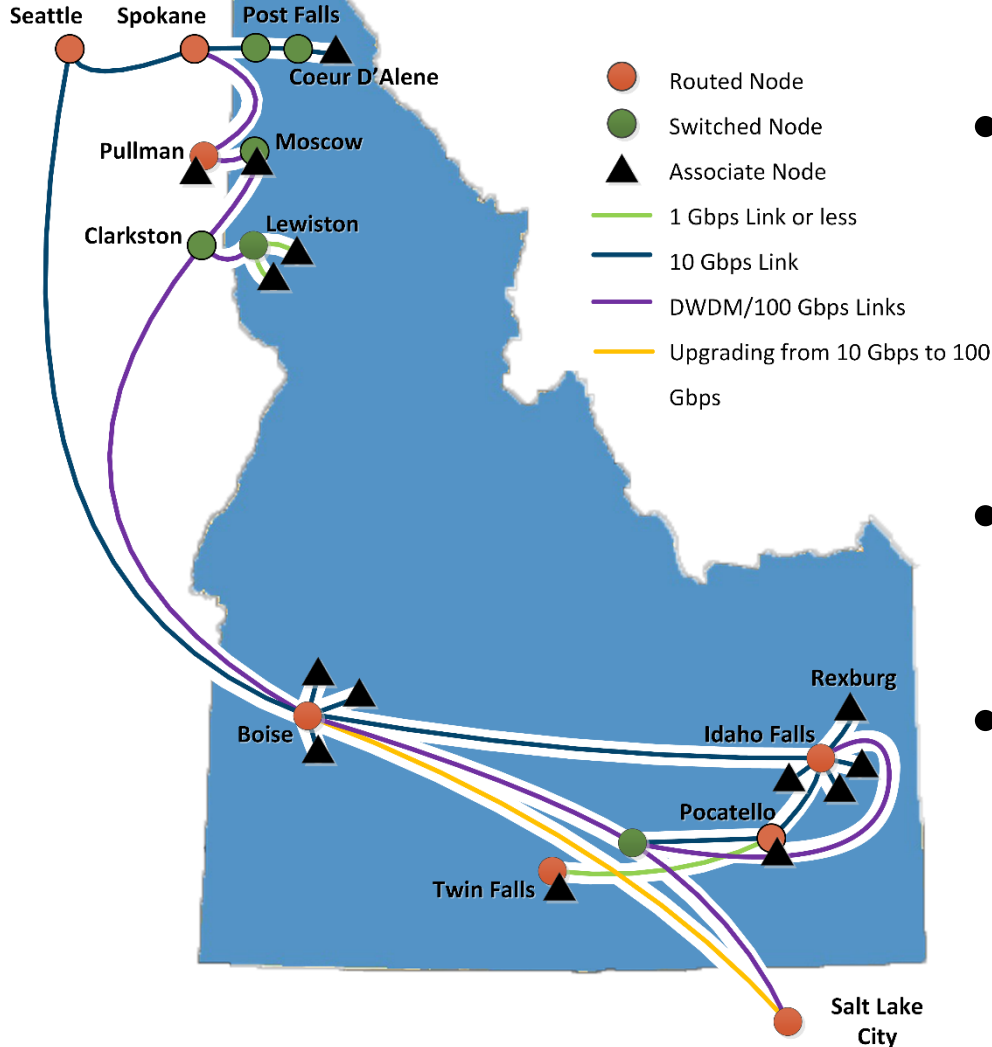
Allen Schmoock, Lewis and Clark State College

David Hill, State Board of Education

Rick Aman, College of Eastern Idaho

IRON

IDAHO REGIONAL
OPTICAL NETWORK



- Grassroots volunteers helping Idaho cross the digital divide
- Fully operational and reliable
- Independent networking voice for Idaho

Thank you!



Questions?



Broadband Access for Idaho Schools (K - 12)

Christopher Campbell
Chief Technology Officer
Idaho State Dept. of Education
Chair, EORC

Will Goodman
Director of Operations
Mountain Home School District
Vice-Chair, EORC

Supporting Schools and Students to Achieve

SHERRI YBARRA, ED.S., SUPERINTENDENT OF PUBLIC INSTRUCTION

07/17/2019

IEN → EORC



- IEN (2008 – Spring 2015)
 - Idaho Education Network
- EORC/Broadband Program (July 2016 – Present)
 - Education Opportunity Resource Committee
- BIIG (July 2016 - Present)
 - Broadband Infrastructure Improvement Grant

Education Opportunity Resource Committee (EORC)



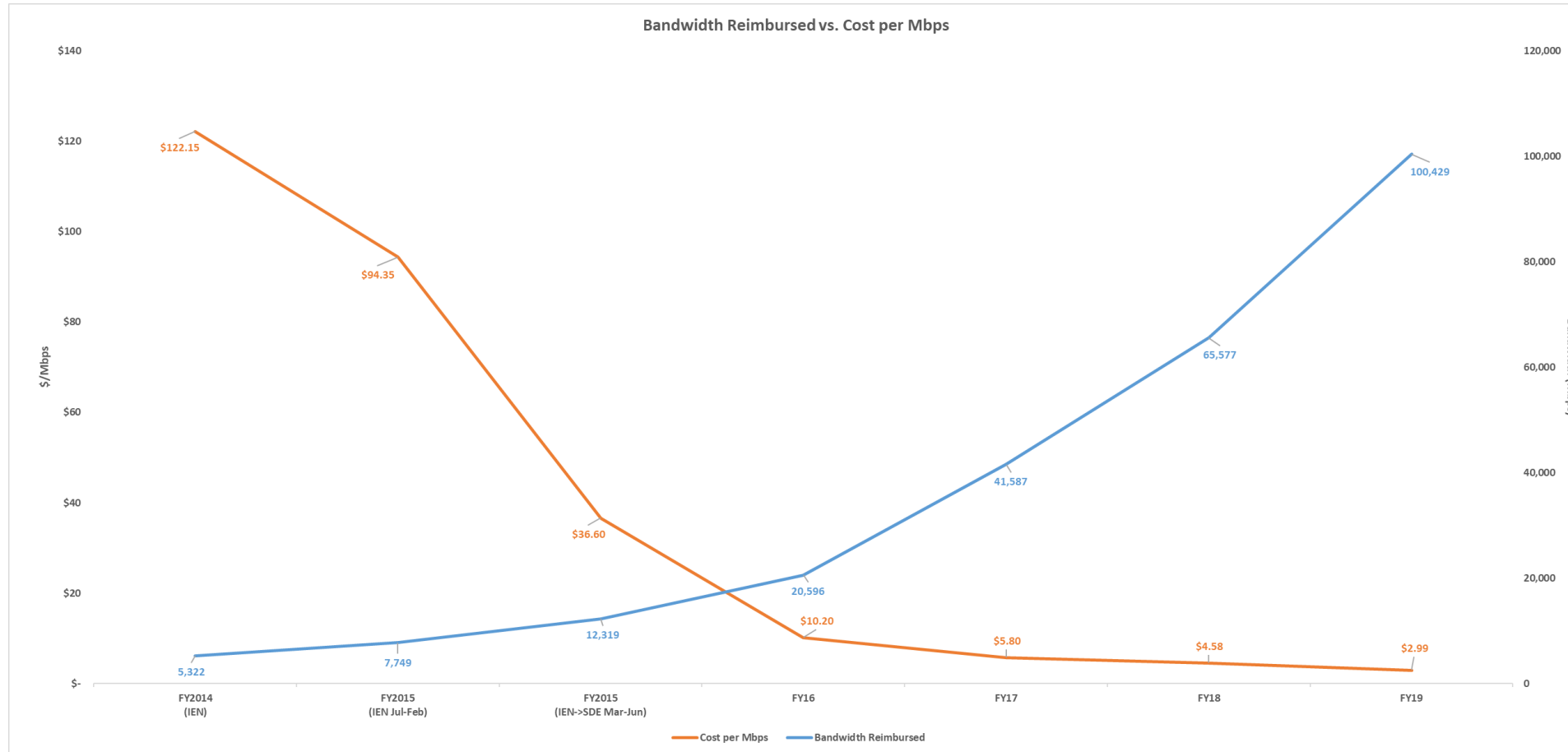
- Idaho Code §33-5601 - §33-5605
- Broadband program oversight committee (schools and libraries)
- Serve E-rate eligible entities' broadband needs
 - Technical guidance, security guidance, E-rate guidance, procurement guidance, funding
 - Related services
 - 1 Gbps per 1,000 Students/Staff (expandable)
 - Evaluate and recommend (bandwidth utilization)
- Broadband program covers cost of internet/WAN not discounted by E-rate

Overview

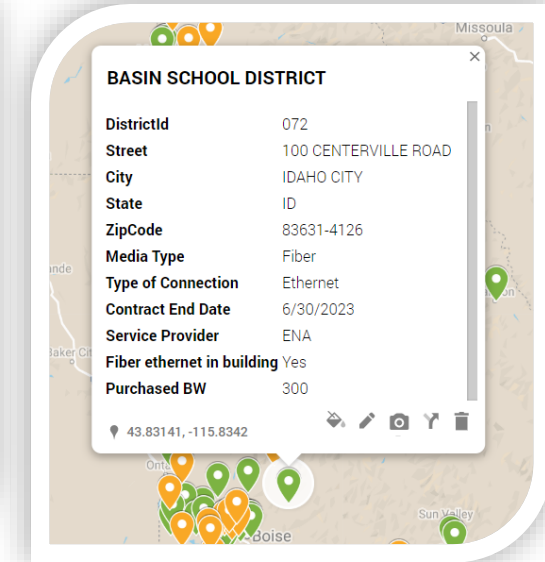
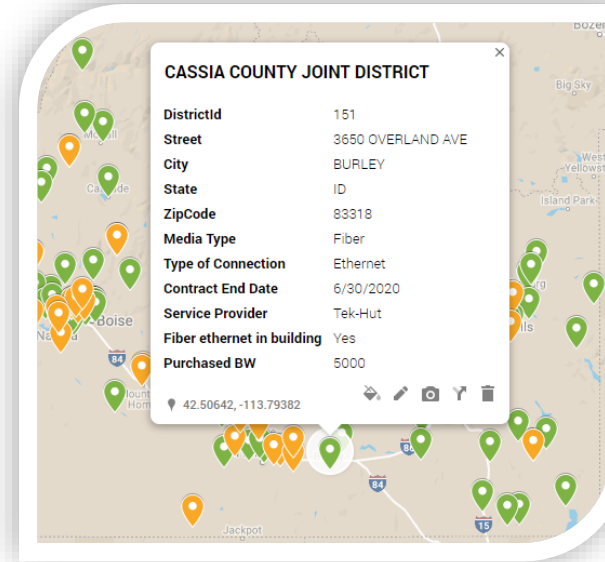
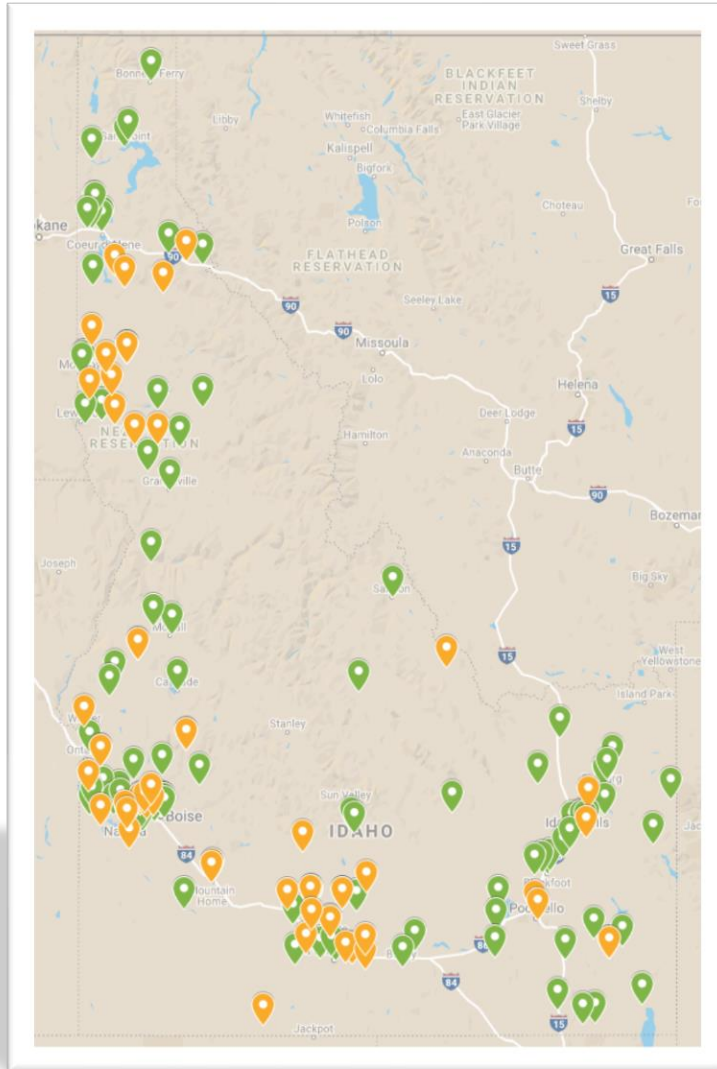


- E-rate
 - Discount for schools and libraries (anchor tenants)
 - Competitive bidding
 - Providers must have valid SPIN
 - Exclusive use
 - School broadband projects (buildouts) can positively impact community access.
 - Cost allocate

Bandwidth Over Time



Internet Access



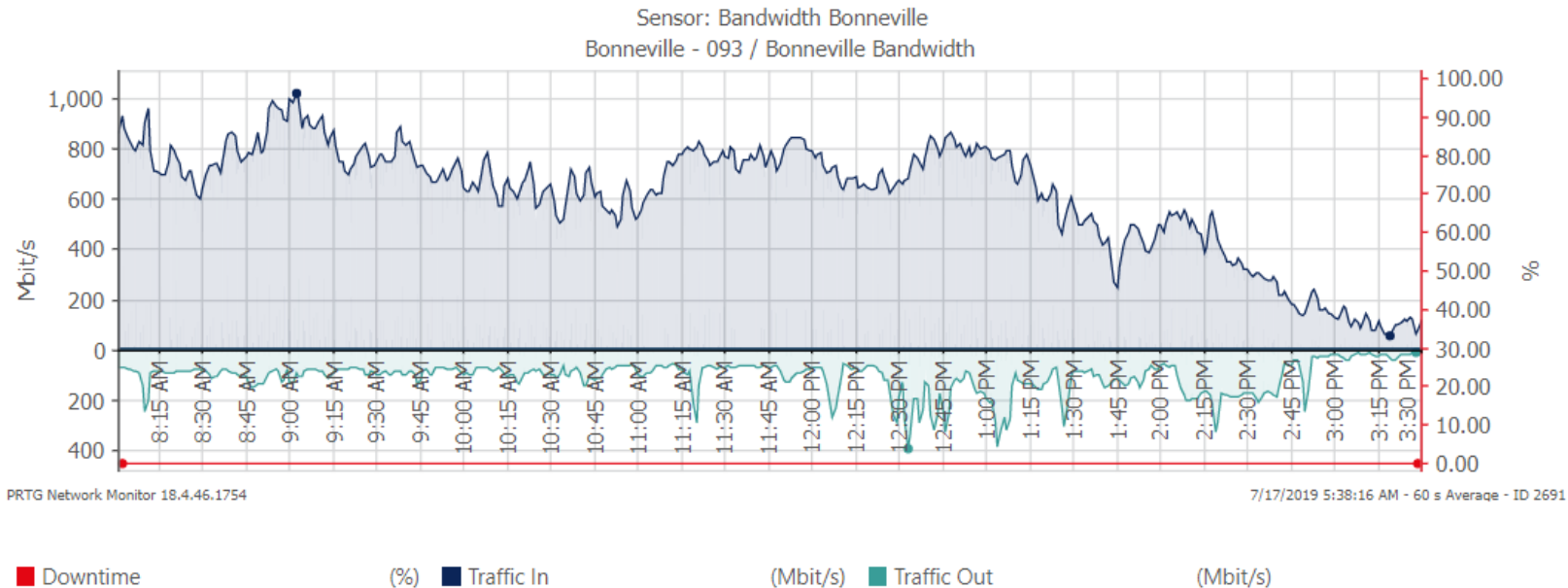
- 167 reimbursed IA connections serving ~900 buildings
 - 111 Fiber Ethernet
- 143 connections \geq 100 Mbps
- 41 connections \geq 1 Gbps
- 5 connections do not meet broadband definition ($<$ 25Mbps)

Bandwidth Utilization



Report for Bandwidth Bonneville

Report Time Span:	5/23/2019 8:00:00 AM - 5/23/2019 3:30:00 PM					
Sensor Type:	SNMP Traffic 64bit (60 s Interval)					
Probe, Group, Device:	Bonneville - 093 > Bonneville - 093 > Bonneville Bandwidth					
Uptime Stats:	Up:	100 %	[07h 28m 59s]	Down:	0 %	[00s]
Request Stats:	Good:	100 %	[451]	Failed:	0 %	[0]
Average (Traffic Total):	726 Mbit/s					
Total (Traffic Total):	2,337,886 MByte					



Internet Providers



ATC	ENA	MTE	Syringa
Blackfoot	Farmers	Mud Lake	Tek-Hut
Cable One	Fatbeam	Nez Perce	Windstream
CenturyLink	First Step	Noel	XMission
Concept	FMT	PMT	XO
CTC	Fremont	Rise	Zayo
Custer Tel	Frontier	RTI	
Direct	Hughes Net	Silver Star	
Electric Lightwave	J&R	Spectrum	

WAN Providers



ATC	Direct	Frontier	Syringa
Blackfoot	E.L. Internet	J&R	Tek-Hut
Blue Mesh	ENA	Mud Lake	UPN
Cable One	Fatbeam	PMT	White Cloud
City of Ammon	First Step	Silver Star	Zayo
Concept	FMT	Suddenlink	

Broadband Infrastructure Improvement Grant (BIIG)



- ❖ Idaho Code §33-910
- ❖ Number of approved projects to date: 19
- ❖ Number of buildings impacted: 58
- ❖ Total cost of projects: \$ 10,664,274
- ❖ BIIG funds committed: \$ 884,209
- ❖ Anticipated cost to LEAs for these projects: \$ 0



Examples: Community Impact



- ❖ Idaho City
 - ❖ Project just completed. Fiber Ethernet available.
- ❖ Middleton
 - ❖ WAN provider now building fiber to homes.
- ❖ Leadore
 - ❖ IA provider now providing WISP services to homes.
- ❖ Clark Fork
 - ❖ Recent project laid fiber across Lake Pend O'reille.
- ❖ Avery
 - ❖ In Process: fiber build to Calder, ID (through St. Maries).



Questions?

Christopher Campbell | Chief Technology Officer
Idaho State Department of Education
650 W State Street, Boise, ID 83702
208 332 6800
cacampbell@sde.idaho.gov
www.sde.idaho.gov/tech-services/broadband

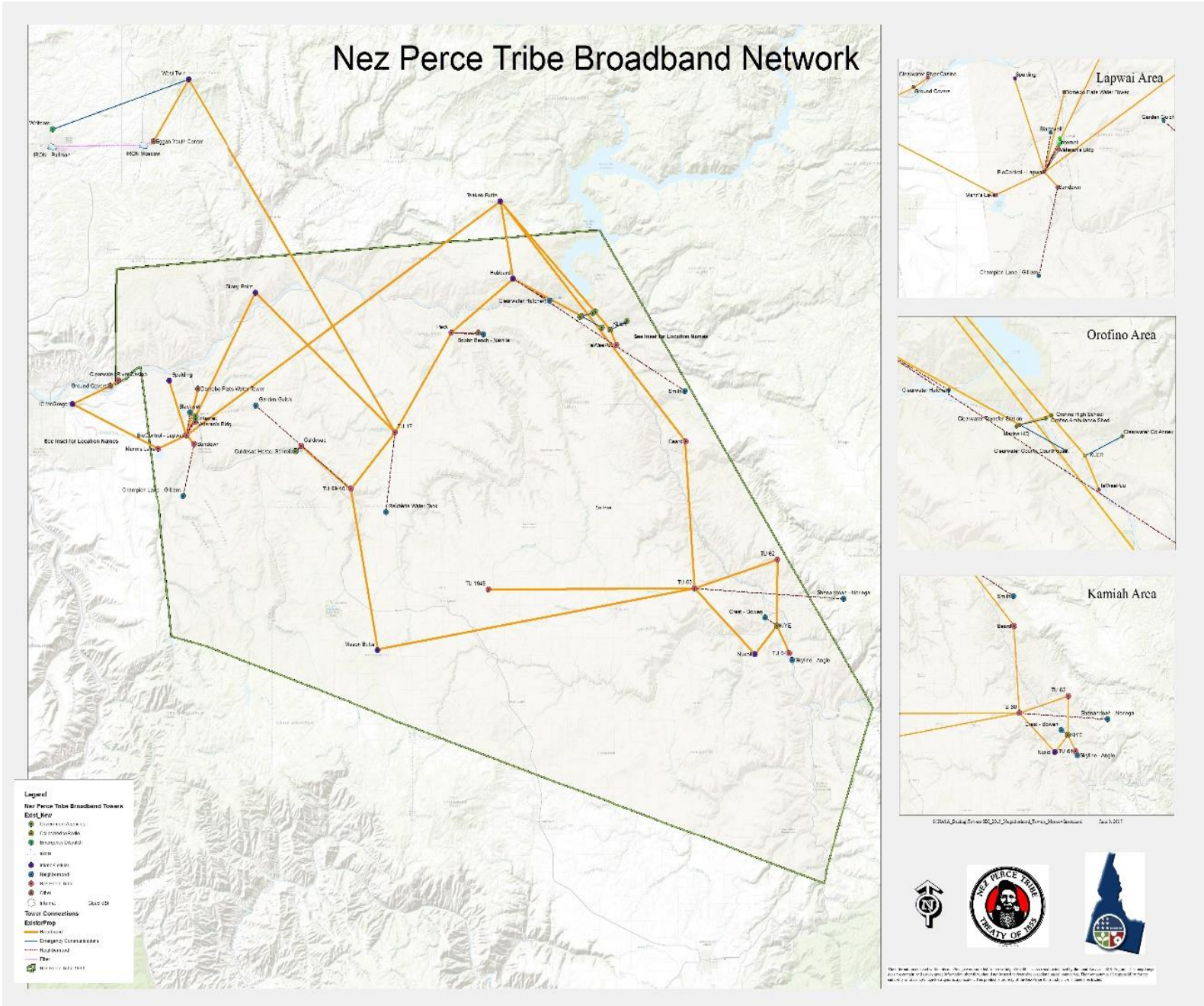
Will Goodman | Director of Operations
Mountain Home School District
Goodman_wa@mtnhomesd.org



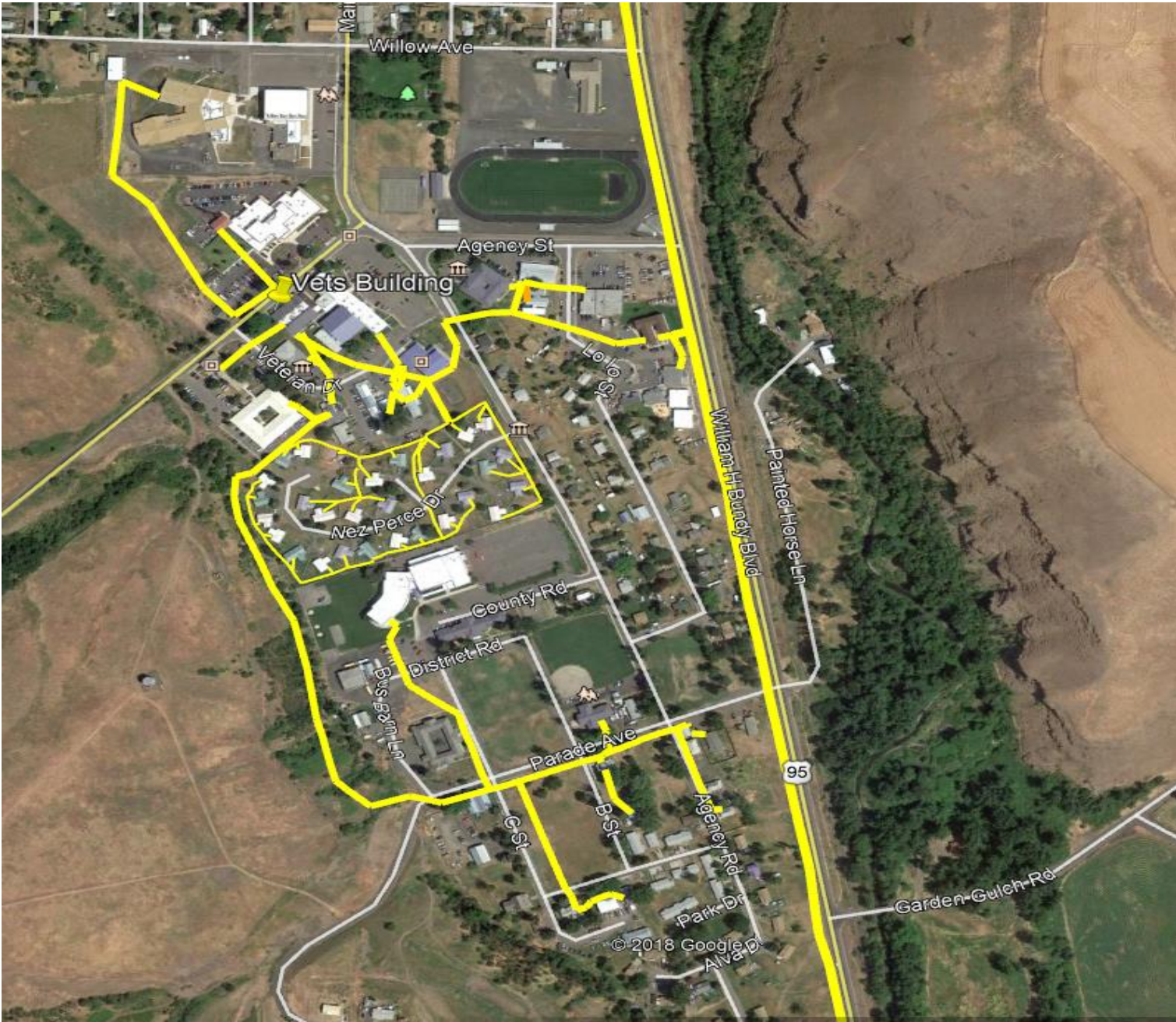
Tribal Buildout in Idaho

Nez Perce, Coeur d' Alene, Shoshone Bannock

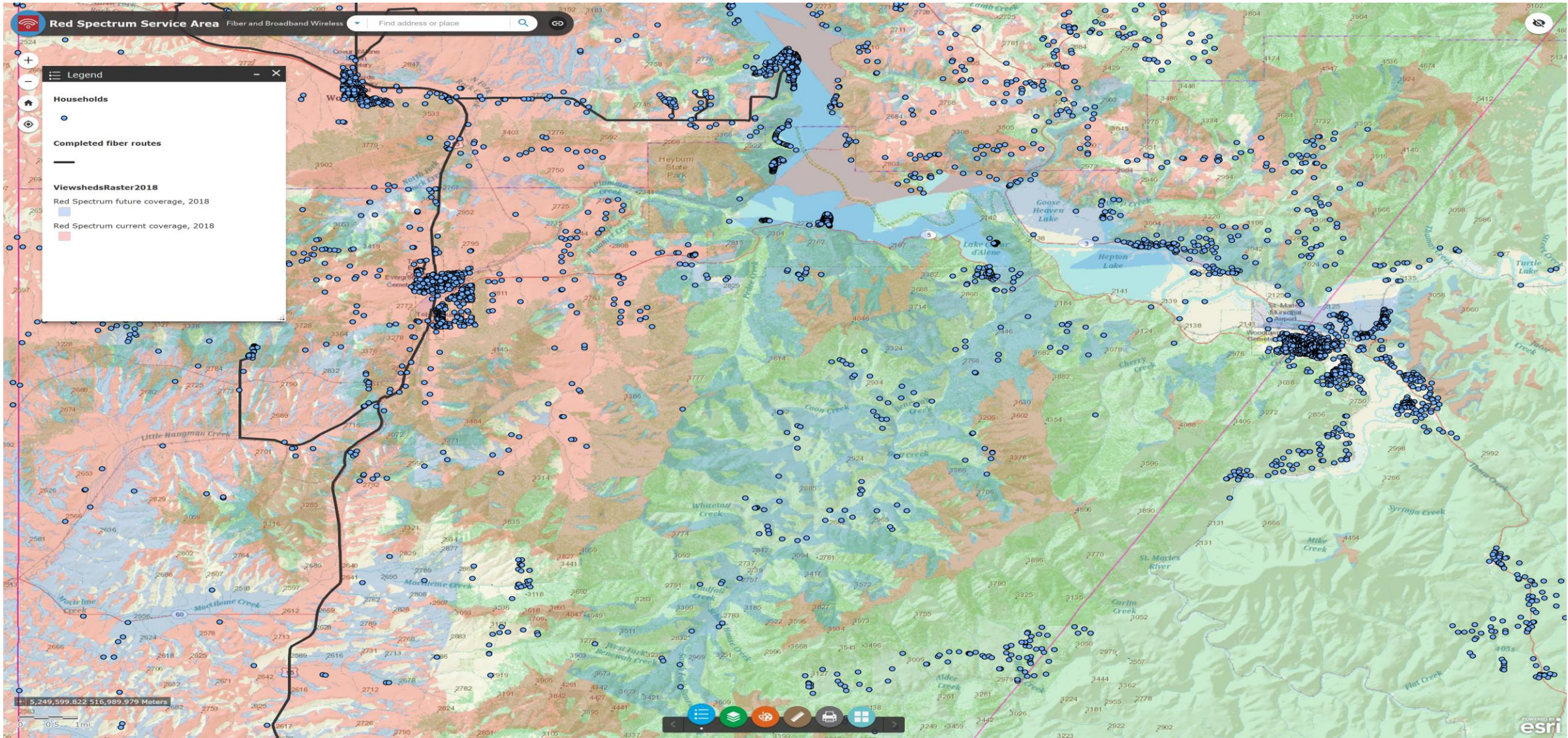
Nez Perce Tribe Microwave Tower Map



Nez Perce Tribe Fiber



Coeur d'Alene Tribe Fiber Map



IDAHO HOSPITALS



Stacey Carson
Vice President, Operations

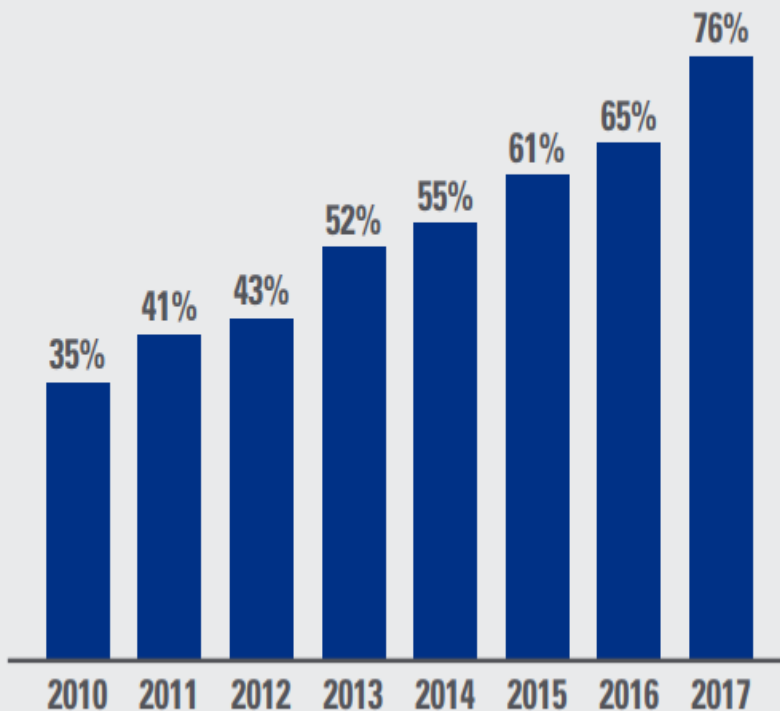
AFFORDABLE BROADBAND FOR HEALTH CARE



USE OF TELEHEALTH IN HOSPITALS

Use of telehealth in hospitals has grown rapidly.

Percent of hospitals fully or partially implementing computerized telehealth system, 2010-2017



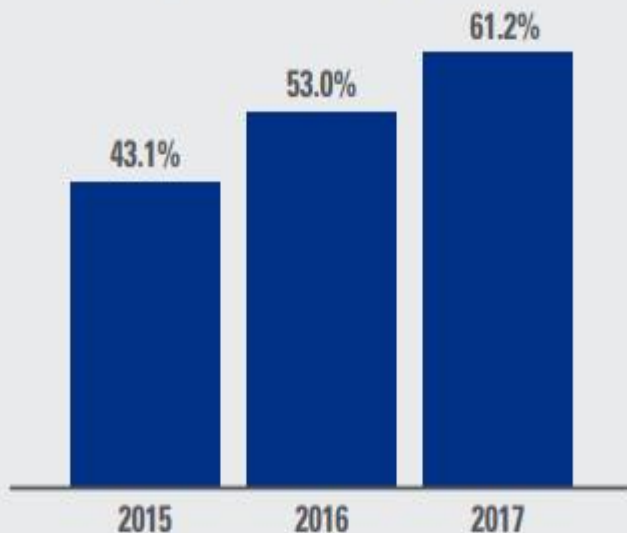
Source: 2011 to 2018 AHA Annual Survey IT Supplement

Telehealth connects patients to vital health care services through videoconferencing, remote monitoring, electronic consults and wireless communications.

REMOTE PATIENT MONITORING (RPM)

More than half of hospitals have implemented remote patient monitoring capabilities.

Percent of hospitals fully or partially implementing remote patient monitoring, 2015-2017



Source: 2016 to 2018 AHA Annual Survey IT Supplement

Remote patient monitoring can be used to reach patients in their homes.

According to Centers for Medicare and Medicaid Services, people with chronic conditions account for 85% of national healthcare spending.

FINANCIAL IMPACT TO COMMUNITIES

"It is critically important to remember that rural telehealth's role in addressing the **significant** health problems inherent to rural areas will depend upon the availability of an underlying, future-proof, fiber-based broadband infrastructure."



Monitoring



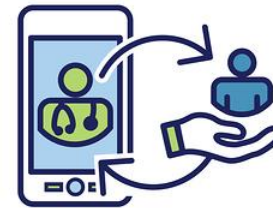
Chat



Diagnose



EKG



Remote
Medicine



Interactivity



App Software



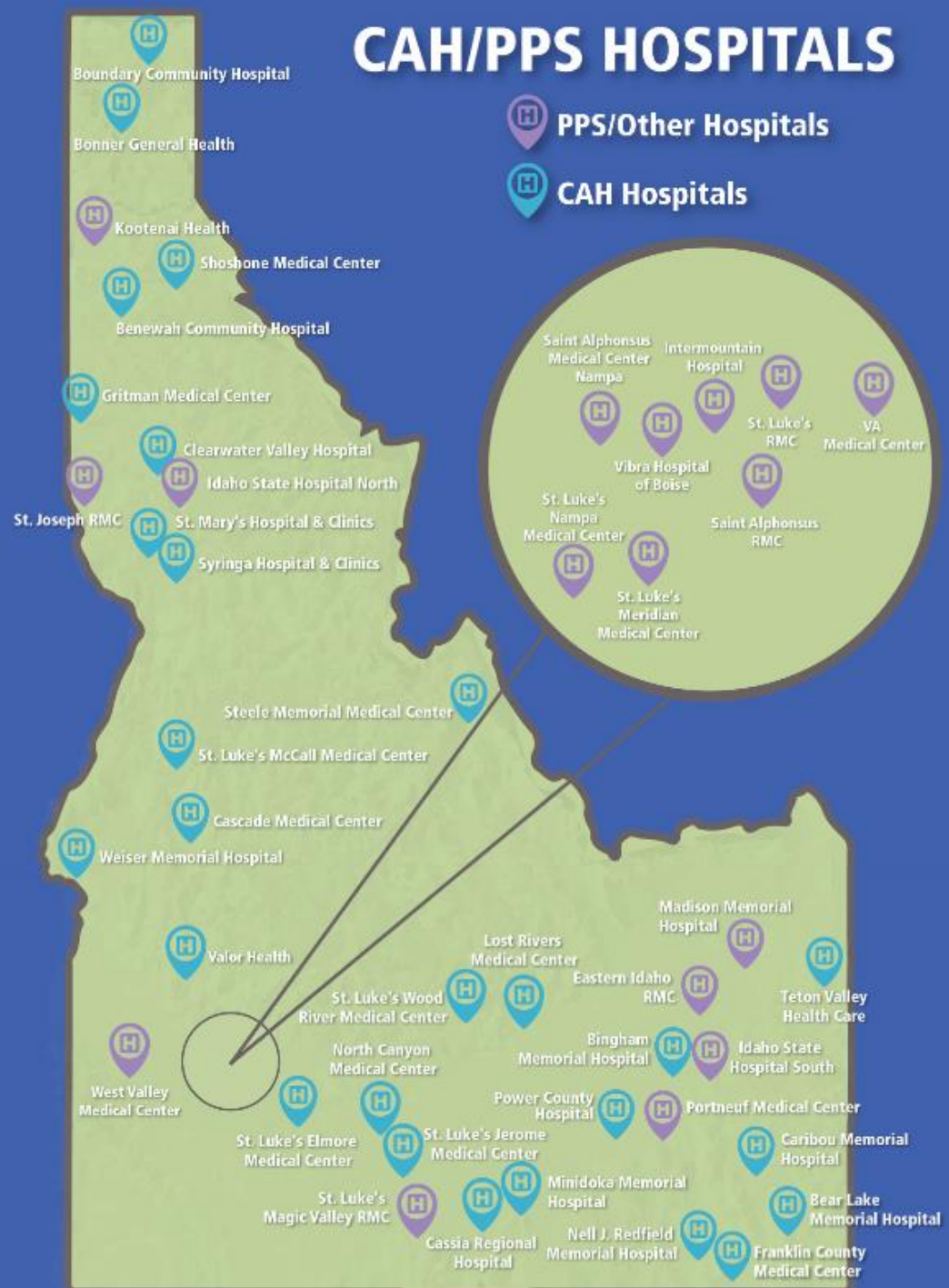
P2P



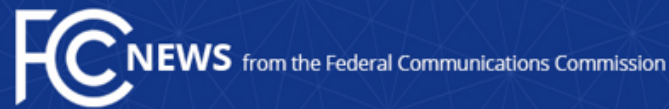
Patient

Schadelbauer, Rick, "Anticipating Economic Returns of Rural Healthcare," NTCA-The Rural Broadband Association, March 2017, https://www.ntca.org/sites/default/files/documents/2017-12/SRC_whitepaper_anticipatingeconomicreturns.pdf

CONSIDERATIONS



FUNDING MECHANISMS



Media Contact:

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mark.wigfield@fcc.gov

For Immediate Release

FCC SEEKS COMMENT ON PROPOSED \$100 MILLION CONNECTED CARE PILOT PROGRAM

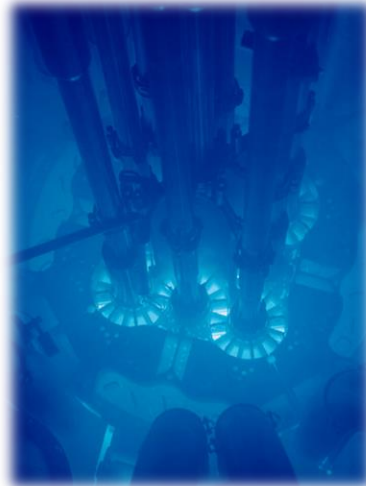
Three-Year Pilot Would Bring Telehealth Services to Low-Income Patients, Veterans and Areas Lacking Adequate Health Care

WASHINGTON, July 10, 2019—The Federal Communications Commission is proposing to establish a three-year, \$100 million Connected Care Pilot program that would support bringing telehealth services directly to low-income patients and veterans.

The proposed Connected Care Pilot would provide an 85% discount on connectivity for broadband-enabled telehealth services that connect patients directly to their doctors and are used to treat a wide range of health conditions. These services can facilitate the effective treatment of chronic conditions outside of the doctor's office, at significant savings for patients and health care providers.

The Notice of Proposed Rulemaking (NPRM) adopted by the Commission today seeks comment on testing a new program, using the FCC's existing Rural Health Care Program authority, that would defray the costs of purchasing broadband Internet access service necessary for providing connected care services directly to low-income patients and veterans.

Idaho National Laboratory

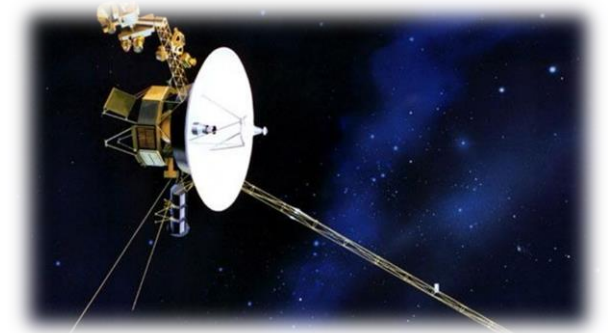


www.inl.gov



Idaho National Laboratory – What We Do!

- Advancing Nuclear Energy
- Securing and Modernizing Critical Infrastructure
- Enabling Clean Energy Deployment
- Battery Assembly for NASA Deep-Space Missions
- Collaborate with Private Industry and Education



K-12 Science, Technology, Engineering, Math

- Leveraging INL partnerships and resources to grow STEM learning opportunities for all of Idaho's students is one of the primary missions of INL's STEM program



Educational Research and Collaboration

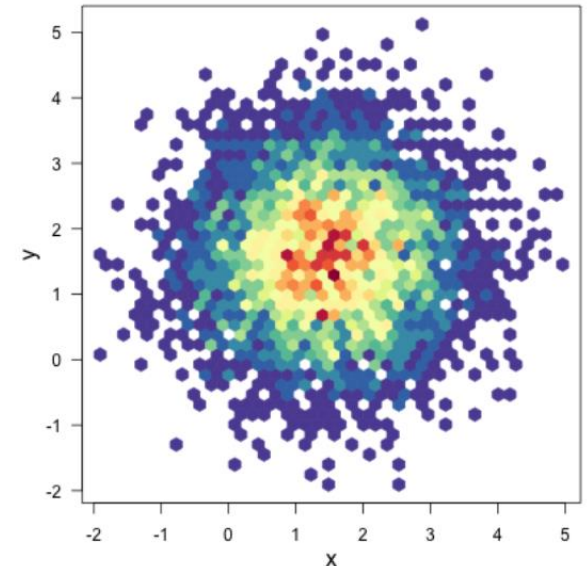
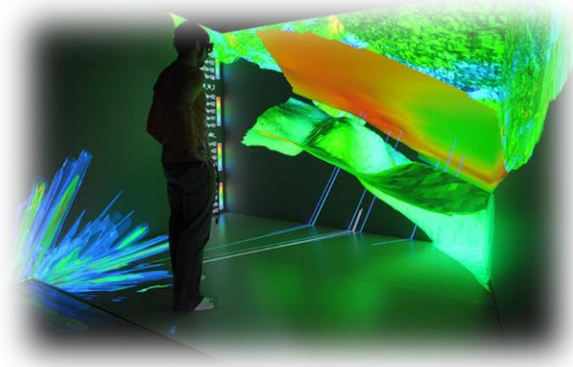


BOISE STATE UNIVERSITY



Broadband Needs – Why is it important to INL

- High Performance Computing
- Large Data Set transfers
- Research and Education
- Critical Infrastructure Cyber Security
- Future Employment Opportunities



Overview of INL's Service

- Where do you currently provide service?
 - 890 square miles of the lab (We use Sparklight, Syringa, IRON, City of Idaho Falls, our own Optical Transport)
- Where do you currently NOT have or need additional service.
 - We are working to create a redundancy in certain areas of the lab
- What types of speeds do you currently offer in your areas?
 - 100/100 Gb
- Is your service exclusive or may it be used by others to help connect other users?
 - Exclusive
- If your service is exclusive, is there a timeline when it may not be exclusive?
 - No
- Who is your current ISP provider(s)?
 - IRON, Energy Sciences Network (ESnet)

Final Thoughts

1. Define the long-term vision for Idaho's broadband
 - Broad band infrastructure equality throughout the state

2. Determine how to remove roadblocks

3. Providers can and are paving the way
 - What do we need to do to assist them

Our Future Is Technology





iNRL

Idaho National Laboratory



Broadband Taskforce Idaho Public Utilities Commissions

Safe and reliable infrastructure to serve a common customer

Who is Avista Utilities?



- Founded in 1889 as Washington Water Power Company
- Changed name in 1999
- Celebrated 125th Anniversary in 2014



- Investor-owned, regulated gas and electric utility
- Headquarters in Spokane, WA
- 1,680 employees
- 369,000 Electric customers
- 329,000 Natural Gas customers
- Serves Washington, Idaho and Oregon

Avista's 128 Year History of Innovation



1903 Longest transmission line in the world

1911 Automatic electric water heater

1915 Largest dam in the world with largest generator

1977 Established Itron

1983 First bio-mass plant in the world

1995 Established Ecova (sold to GDF Suez)

1996 Established Reli-On fuel cell company (sold to Plug Power)

2001 First geographic based Outage Management System (OMS)

2009 Awarded three Department of Energy American Recovery and Reinvestment Award (ARRA) smart grid grants

2015 Largest vanadium flow battery in North America and Europe

2015 Largest community solar in Washington state

2019 Largest solar farm in the State of Washington



Avista Joint Use and Licensee Partners



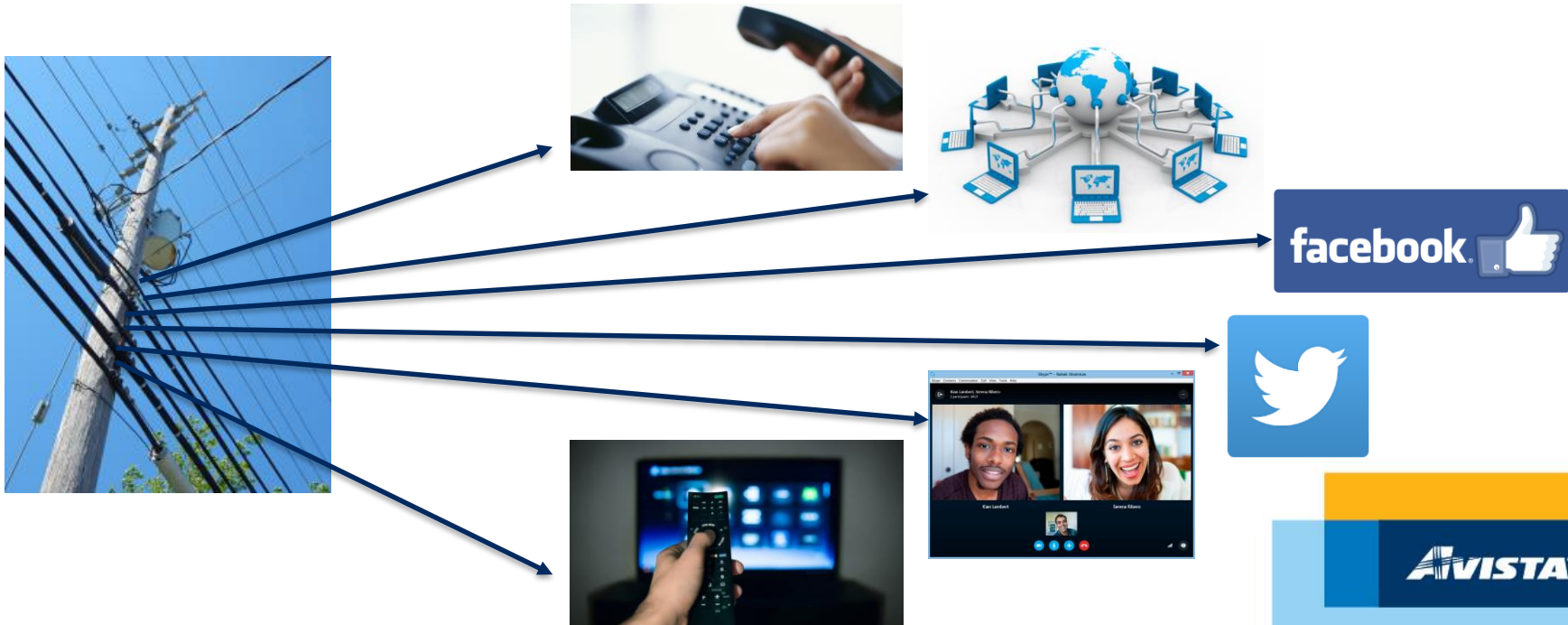
Avista currently has over 75 Joint Use and Licensee partners in Idaho and Washington comprised of; telephone, telecommunications, cable television, government, port districts, municipalities, native American tribes, hospitals, school districts, universities, businesses, and many other profit and non profit entities. Avista Utilities is a founding member of the Inland Empire Joint Use Association (IEJUA is a 501 C-6, dedicated to improving safety and relationships on shared utility infrastructure)



Safe and Reliable Pathways

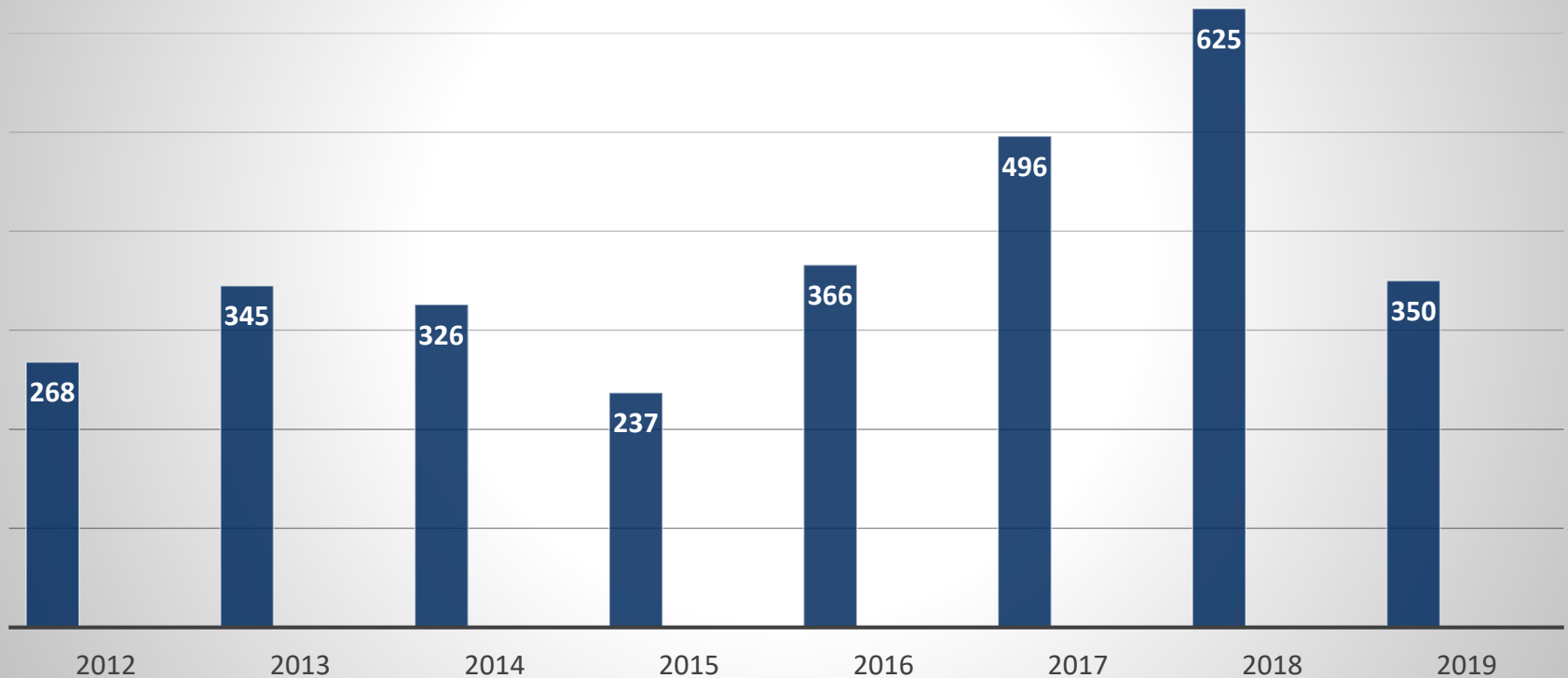
On average Avista has at least 2 joint use cables on every one out of two utility poles throughout its service territory, approximately 195,000 structures.

Avista has robust wood pole management and grid modernization programs that invest millions of dollars annually. This not only ensures a safe and reliable electric supply but also a network that is ready for communication providers to deliver products and services to the customers we serve in common.



Unprecedented Activity

Number of Applications/Year



Timelines

- Target goal of 45 days to first review
- Avista on average is 10 days
- Complexity and accuracy directly effect review
- RR, IDT, TRIBAL, NEPA, SEPA also have effects
- Dwindling resource pool for experienced human resources
- Make ready completed within 60-75 days
- Limited resources for electric make ready work

New Technologies; 4G, 5G, CBRS

Towers

Tall. Visually prominent.



Small cells

Discreet. Lower to the ground.



Towers

Best for low-density populations.



Small cells

Good complement for dense areas with high capacity needs.



Small Cell radios are designed to fill in for capacity gaps where Macro sites would be difficult or impossible to place.

Small cell installation on Avista street light and distribution poles.





3:53

+ Queue

Download

Embed

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- Google+
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POLITICS

Wireless Industry Lobbies Statehouses For Access To 'Street Furniture'

April 11, 2017 - 5:00 AM ET

AUSTIN JENKINS

FROM NORTHWEST NEWS NETWORK



CITYLAB

The next generation of cell phone technology will be much faster but require far more antennas than carriers c

INTERNET

WEDNESDAY 14, JUNE 2017

State Legislature plans for the world of 5G

by John Stang

How fast Washington can boost its internet speeds and capabilities largely boils down to utility poles: unglamorous wood logs, stuck in the ground and usually lost in the background of the landscape.

The state Legislature is planning for the world of 5G —the coming fifth generation of wireless technology, which promises to increase download speeds enough to download a full HD movie in a few seconds at home while greatly expanding virtual reality options. By some accounts, it will open up new business possibilities that we don't even imagine now. The majority of Washington hit the 4G threshold around 2010. But parts of the state are essentially running on the much-slower 3G — or third-generation — technology.



DESIGN / TRANSPORTATION / ENVIRONMENT / EQUITY / LIFE



Among other things, cities worry that letting companies install "small cells" unregulated could compromise the aesthetic of their neighborhoods. // Rogelio V. Sotelo/AP

Cities Want Super-Fast Wireless Internet, But on Their Terms

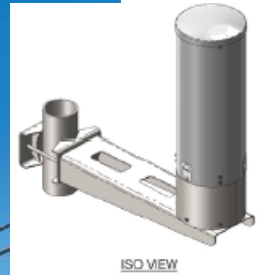
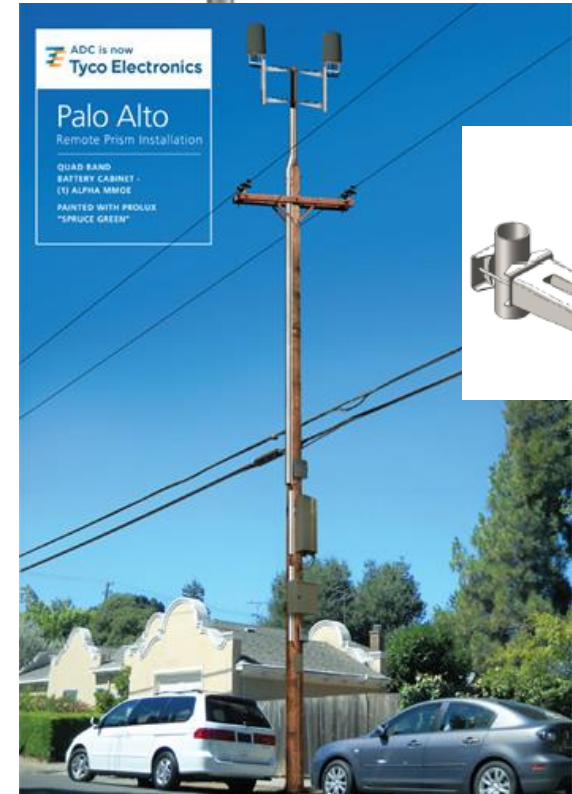
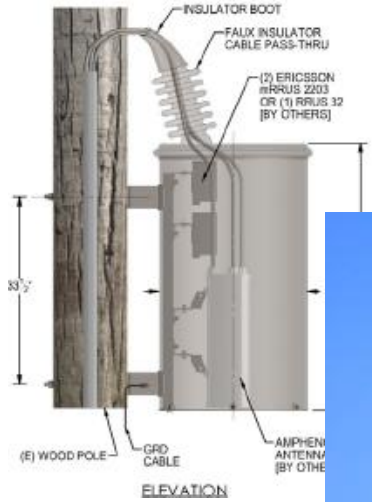
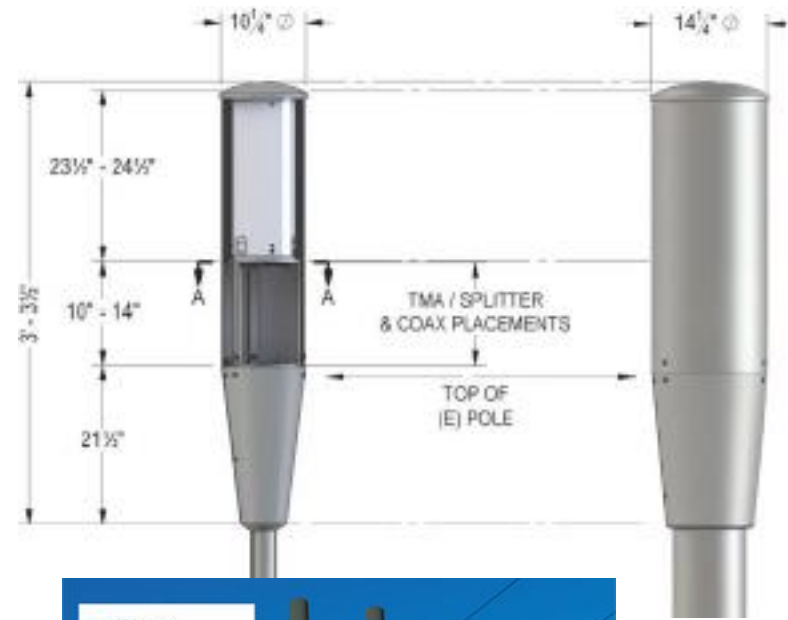
LINDA POON OCT 9, 2017



Regulatory opportunities

- One touch make ready
- Double wood remediation
- Streamlined permitting
- Statewide template for small cell
- National utility infrastructure data base

All shapes and sizes.....



And more.....

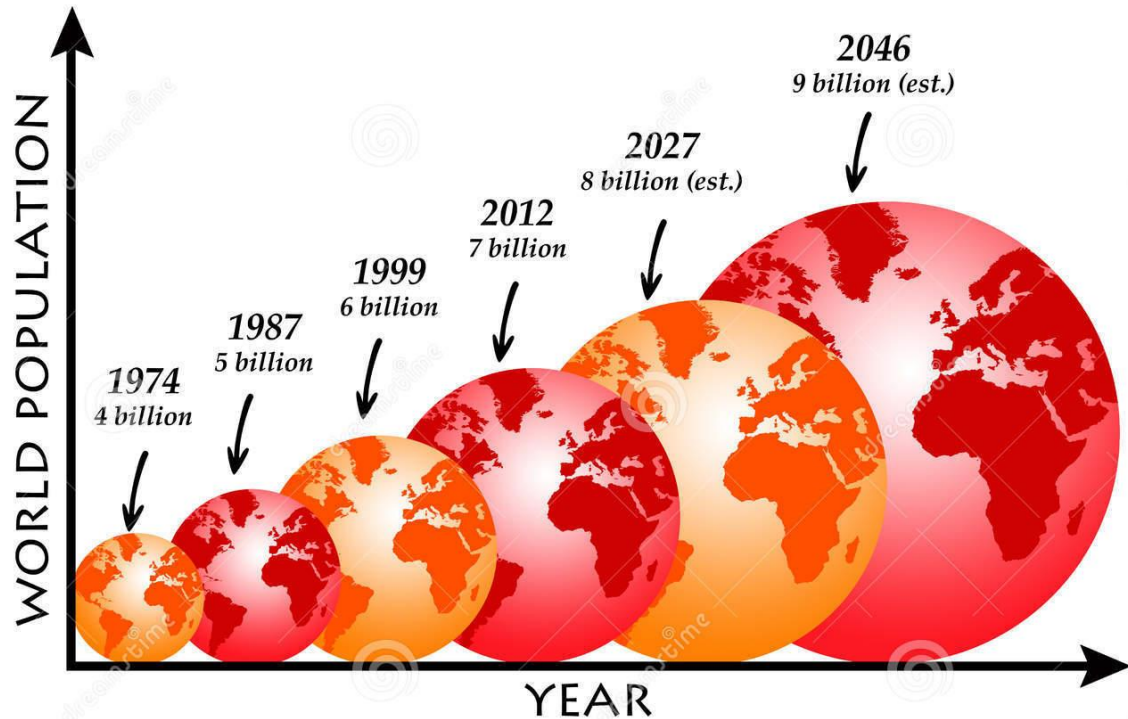


Many variations, similar components...

- Antenna
- Remote radio unit (RRU)
- Backhaul-pathway back to the larger network-can be fiber, copper, microwave

WHY?

It's a small world.....with a lot of people in it and more every year



Download from
Dreamstime.com

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ID 35237572

© Alain Lacroix | Dreamstime.com

Why does the wireless network need to expand?

- More people than ever before are relying on wireless technologies to **connect with their lives and livelihoods**
- U.S. Mobile data usage is set to grow **seven fold** through 2019
- Increasing applications of IoT (**internet of things**) because everyone needs a connected toaster😊.
- Just over **48%** of all households are **wireless only** for their telecommunications needs
- In North America, the average household has **13 connected devices**
- Smartphones outnumber tablet devices **6 to 1**

What does that mean to us as an industry?

- Ever increasing demand for the products and services that are delivered to our common customers.
- A need to build out new infrastructure in a safe, efficient and effective manner on existing poles.
- Increased competition for a finite amount of space on overhead structures and the right of way itself
- Increase regulatory scrutiny and action at the Federal, State and local level.
- Active lobbying by the wireless industry. 22-5g wireless bills passed in 2017 granting access to the right of way for wireless infrastructure

WHERE?

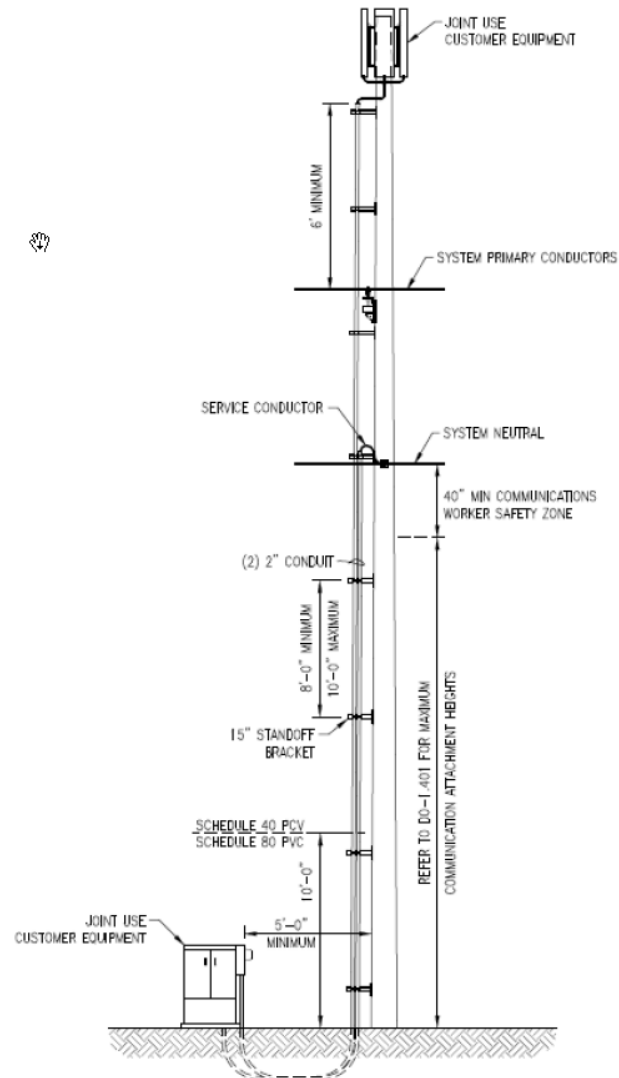
The where might depend on who you are.....

- WUTC 2016 rulemaking included wireless facilities access to poles in the right of way and applies only to Investor Owned Utilities (IOU)
- Pending law suits and legislation may open up access to City owned and other Electric Utilities
- Street light poles may be excluded as well as transmission only poles.....for now
- Attachment rates vary and are subject to interpretation
- All attachments require an agreement

Distribution pole-pole top

Joint Use Antenna/Radio Installation Pole Mount Requirements

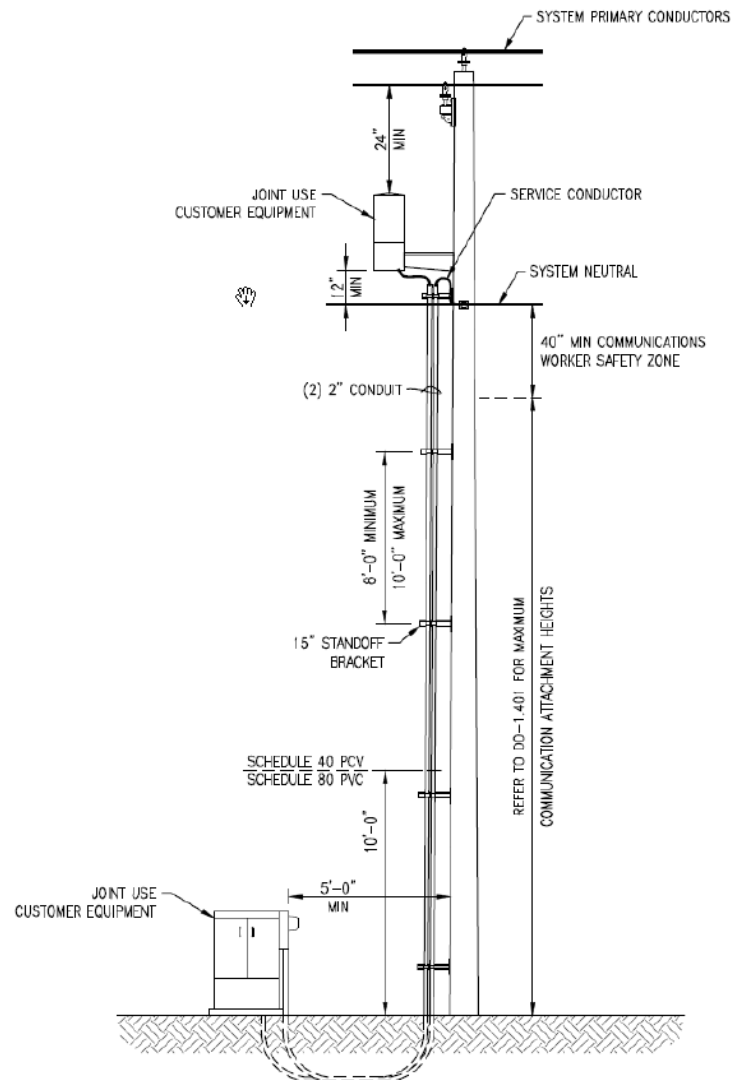
DO-1.492



Distribution pole-supply space

Joint Use Antenna/Radio Installation Pole Mount Requirements

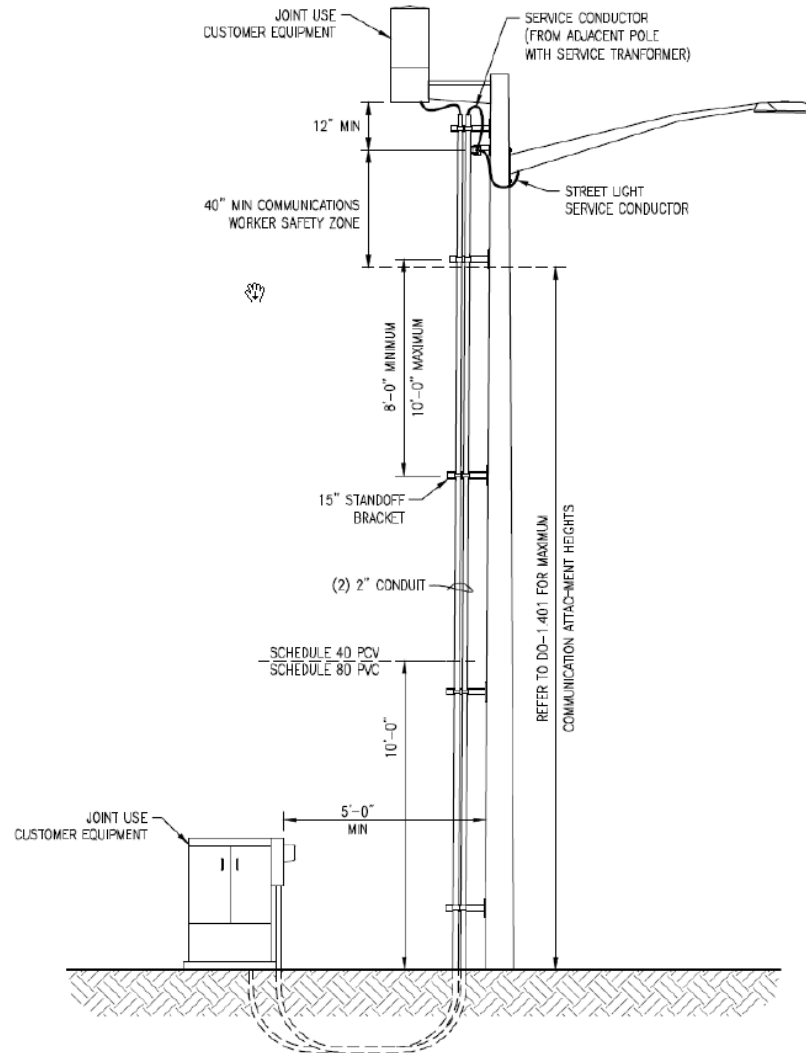
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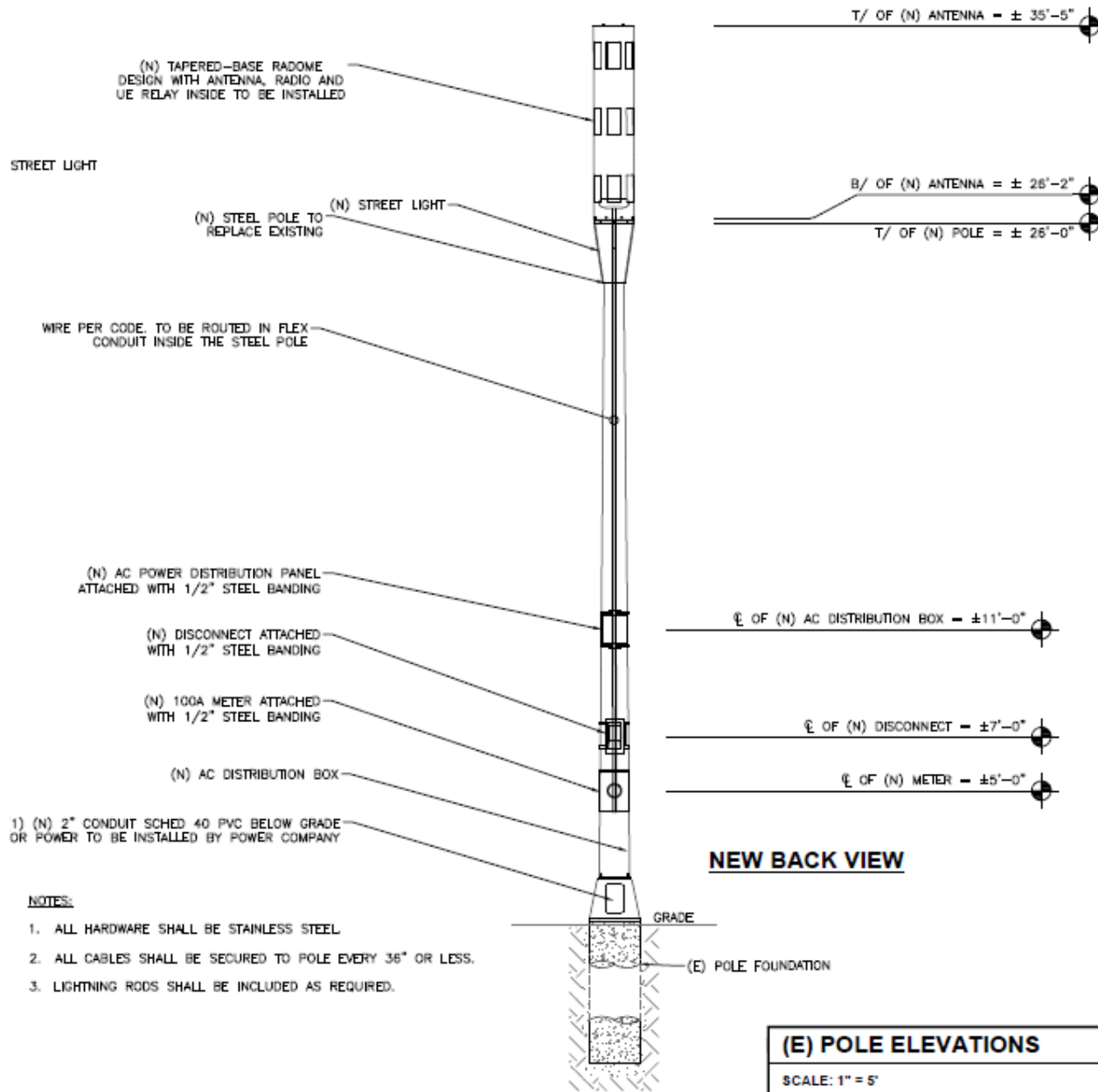
Stand alone wood street light pole

Joint Use Antenna/Radio Installation Wood Street Light Pole Requirements

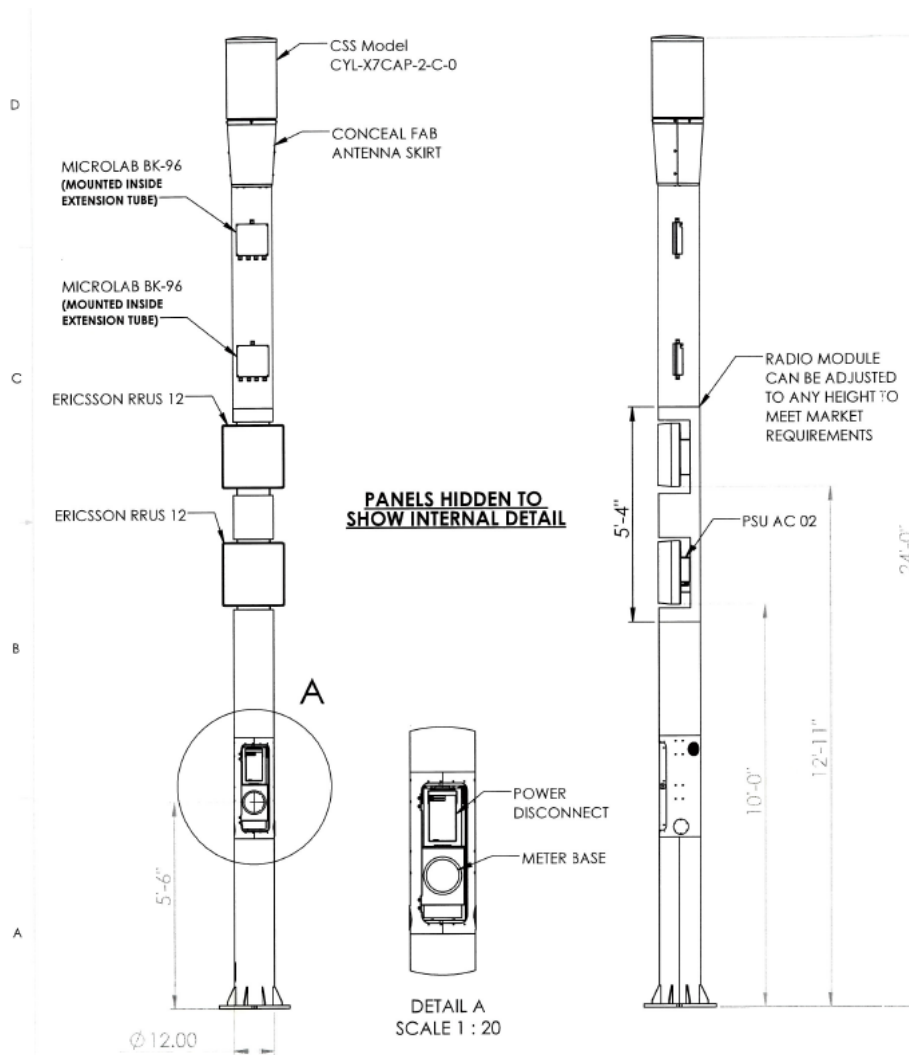
DO-1.493



Steel Street Light Pole



Stealth pole



Not every pole qualifies.....

- Non-complex poles are the best and only candidates
- Complex poles can be; switch poles, buck poles, primary dips, transformer banks, primary metering, double circuit, etc.
- Poles must be truck accessible and in the right of way
- Some easements are for electric facilities only, further research may be needed
- Only one radio/antenna per pole

Other considerations....

- Possible interference with electric utility radio network, increased noise floor
- Reservation of space of specific poles for utility communications; mesh radio, AMI, relay control, other internal wireless communication

HOW?

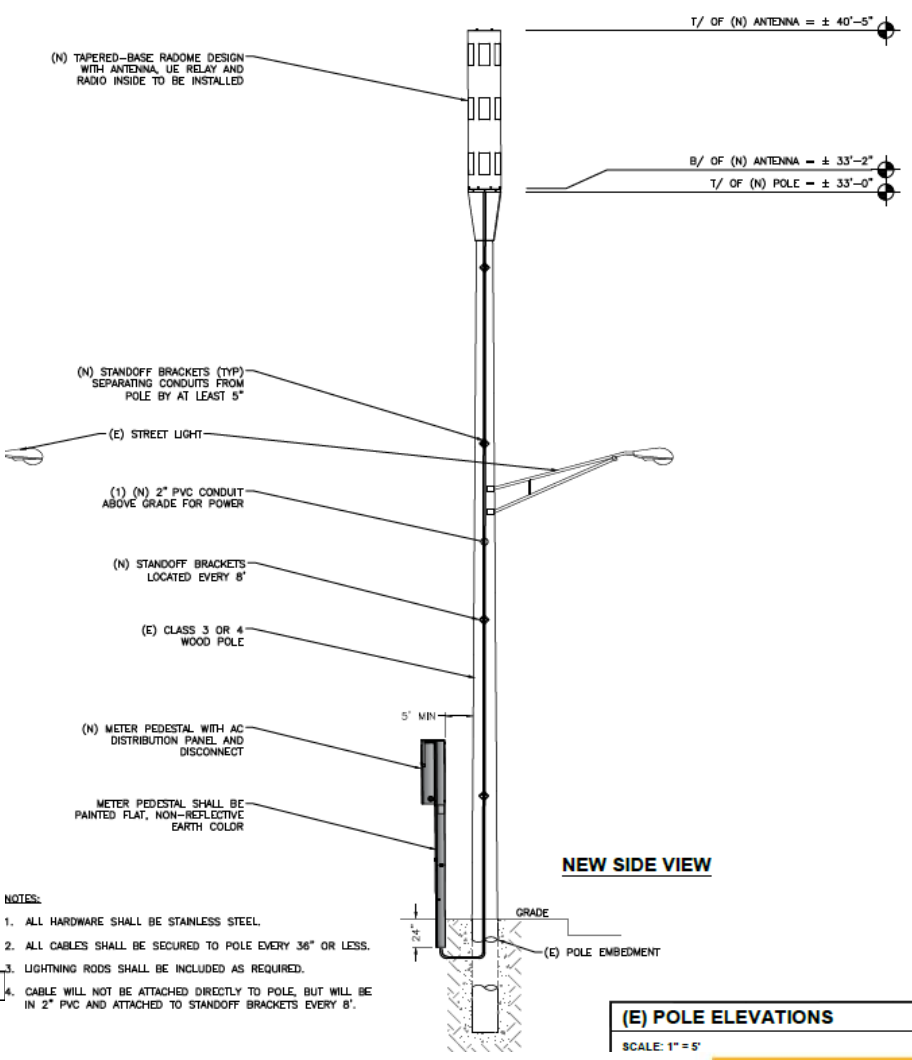
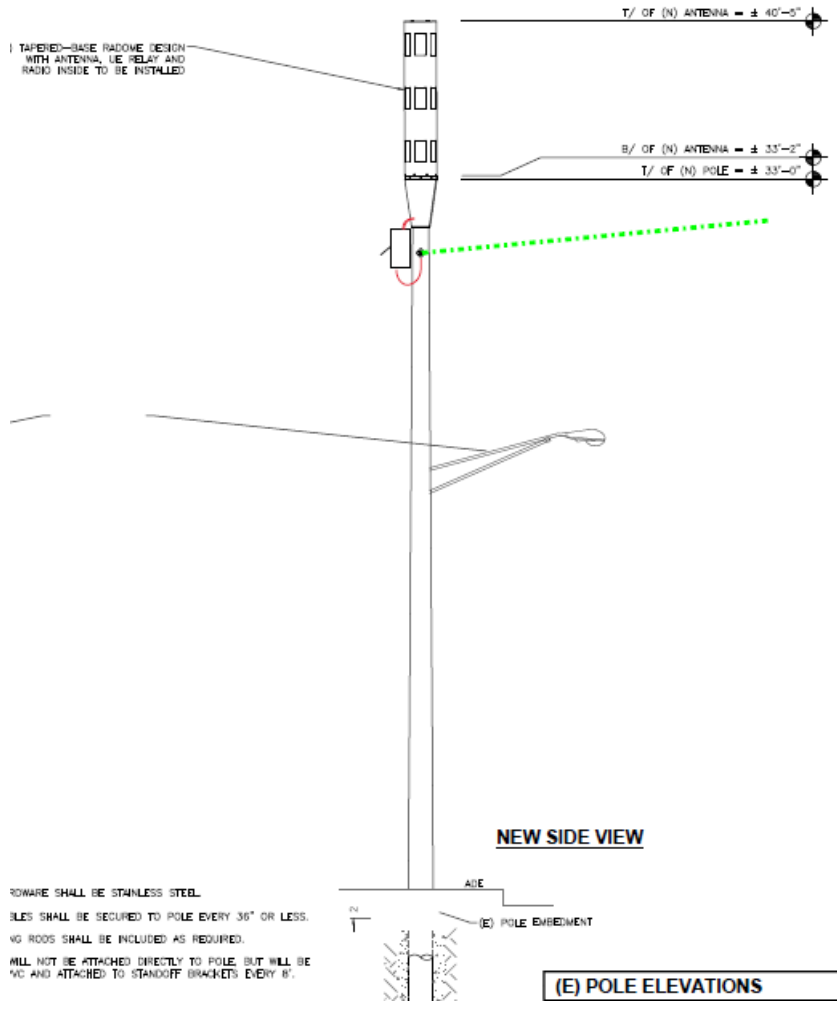
Who does the work...

- Only qualified linemen can be in or above the supply space
- Contract labor certified by Avista
- Costs are passed through
- If the equipment is at the pole top or mid pole then it is above the communication worker safety zone and can only be installed and maintained by a qualified worker
- Washington Administrative Code Chapter 296-32 Safety Standards for Telecommunications
- Washington Administrative Code Chapter 296-45 Electric Power Generation, Transmission, Distribution

Fixed consumption Electric service....

- Fixed consumption electric usage may help in keeping equipment out of the right of way
- Meters on poles? May create code conflicts and issues with qualified worker access
- Charge is made up of a basic charge plus usage based on PE certified usage report
- Yearly draw verifications to ensure accurate billing
- Fusing protection prevents over draw

Electric service options....



Strand mounted in the communication space

- Attached to existing support strand
- Must have hazard label and shut off switch
- Falls under wireline rules?
- Can be installed by communication workers



WHEN?

The short answer is yesterday...

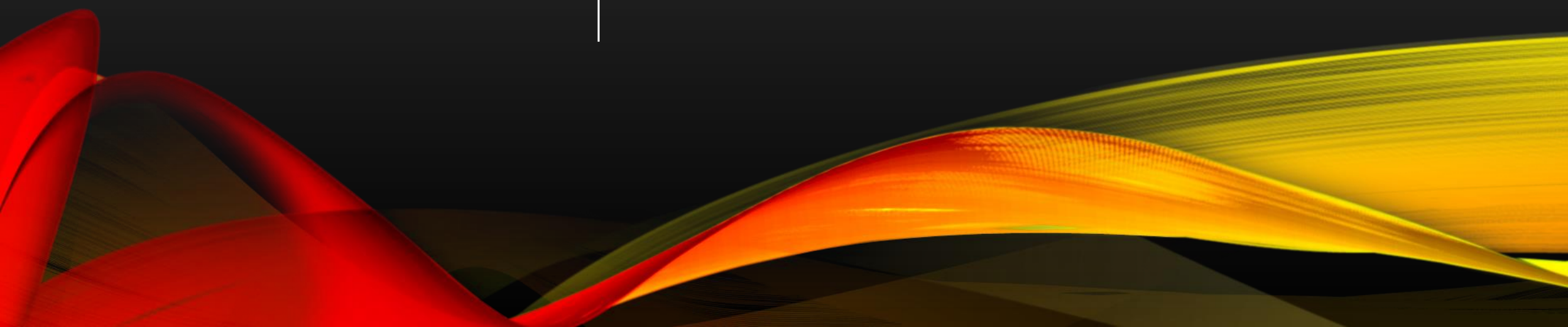
- Many carriers cannot keep up with demand
- No slowdown on the horizon
- Utility infrastructure may hold the key to future 5g deployment
- Increasing reliance on wireless infrastructure by first responders, utilities and let's face it everyone
- Increasing use for IoT and connected devices

The near future....

- The FCC expects continuing increases in data consumption
- To fill that need the FCC estimates that 100,000-150,000 small cell antennas must be deployed by 2019, 455,000 by 2021 and 800,000 by 2027!
- 50% of all installations will be on electric utility poles (roughly 680,000 locations)
- Average yearly load per antenna is 4370 kWh.

Presented to the Idaho
Broadband Task Force –
July 17, 2019

IDAHO FIXED BROADBAND REPORT



EXECUTIVE SUMMARY

- The Idaho Broadband Cable Association commissioned an independent report from Cable Labs to look at broadband penetration in Idaho.
- Idaho has widespread availability of fixed broadband service and has comparable levels of broadband to other Intermountain West states.
- Nearly all (more than 99%) of Idaho's population and housing units have available fixed broadband service of 25 Mbps (down) and 3 Mbps (up), or higher, and a significant majority have available substantially higher speeds, including gigabit service.

BACKGROUND

- The analysis in this report is based on the most recent, publicly available deployment data (December 2017 Form 477 data) from the Federal Communications Commission (FCC) and population and housing data from the U.S. Census Bureau.
- In 2000, the Federal Communications Commission (FCC) first established the Form 477 data collection to gather deployment and subscription information on broadband services, local telephone service competition, and mobile telephone services.
- All broadband providers including wireline, fixed and mobile wireless, and satellite are required to file a Form 477 with the FCC on a semiannual basis.
- Each provider of fixed broadband service must report, at the Census-block level, whether consumer and/or business services are offered as well as the maximum available data rates (downstream and upstream) offered for each form of access technology deployed.

DEFINITIONS

- **All Fixed** - Satellite, Wireless (microwave), and Wired
- **Fixed Terrestrial** – Wireless communications to connect two fixed locations.
- **Wired** - DSL, Cable, Fiber
- **Census Block** – the smallest geographic unit used by the US Census Bureau for tabulation.

STATE OF BROADBAND IN IDAHO

- As of December 2017 (which is the most recent publicly available FCC 477 dataset), nearly all of Idaho's population and geography have access to fixed broadband service, defined as 25Mbps (down)/3Mbps(up) or higher.
- In comparison, 85% of Idaho's population have access to fixed terrestrial broadband service (i.e., wireless and wired) and 82% have access to wired broadband service (e.g., DSL, cable, and fiber).

POPULATION AND HOUSING COVERAGE

Transmission Technologies	Population	% Population	Housing Units	% Housing Units
<u>All Fixed</u> (Satellite, Fixed Terrestrial Wireless, and Wired)	1,716,700	99.995%	721,703	99.996%
<u>Fixed Terrestrial</u> (Wireless and Wired)	1,464,823	85.323%	604,584	83.769%
<u>Wired</u> (DSL, cable, fiber)	1,408,576	82.047%	574,609	79.616%

MAX SPEED AVAILABILITY

- In addition to fixed broadband being widely available in Idaho, a significant portion of Idaho's population and housing units have available broadband speeds substantially higher than 25/3, including widespread availability of gigabit broadband service.
- As of December 2017, over 80% of Idaho's population had at least 100 Mbps downstream speeds available and 65% had gigabit broadband service available.
- Similar levels of availability are also seen when examining housing units.
- "Gigabit broadband service" is defined as a downstream speed of 940 Mbps or higher.

MAX SPEED AVAILABILITY

Max Download Speed Available (Mbps)	Population	% Population	Housing Units	% Housing Units
25-50	302,713	17.632%	143,898	19.938%
50-100	26,222	1.527%	12,072	1.673%
100-250	256,619	14.948%	115,280	15.973%
250-500	17,101	0.996%	11,914	1.651%
940+	1,114,046	64.891%	438,539	60.762%

FACTORS IMPACTING SPEED

- Device Specs/Limitations
- Hardwire vs. Wifi Connection
- Desktop App or Browser Selection
- Antivirus & Viruses
- # of Connected Devices and Open Apps
- Server Location

CHOICE

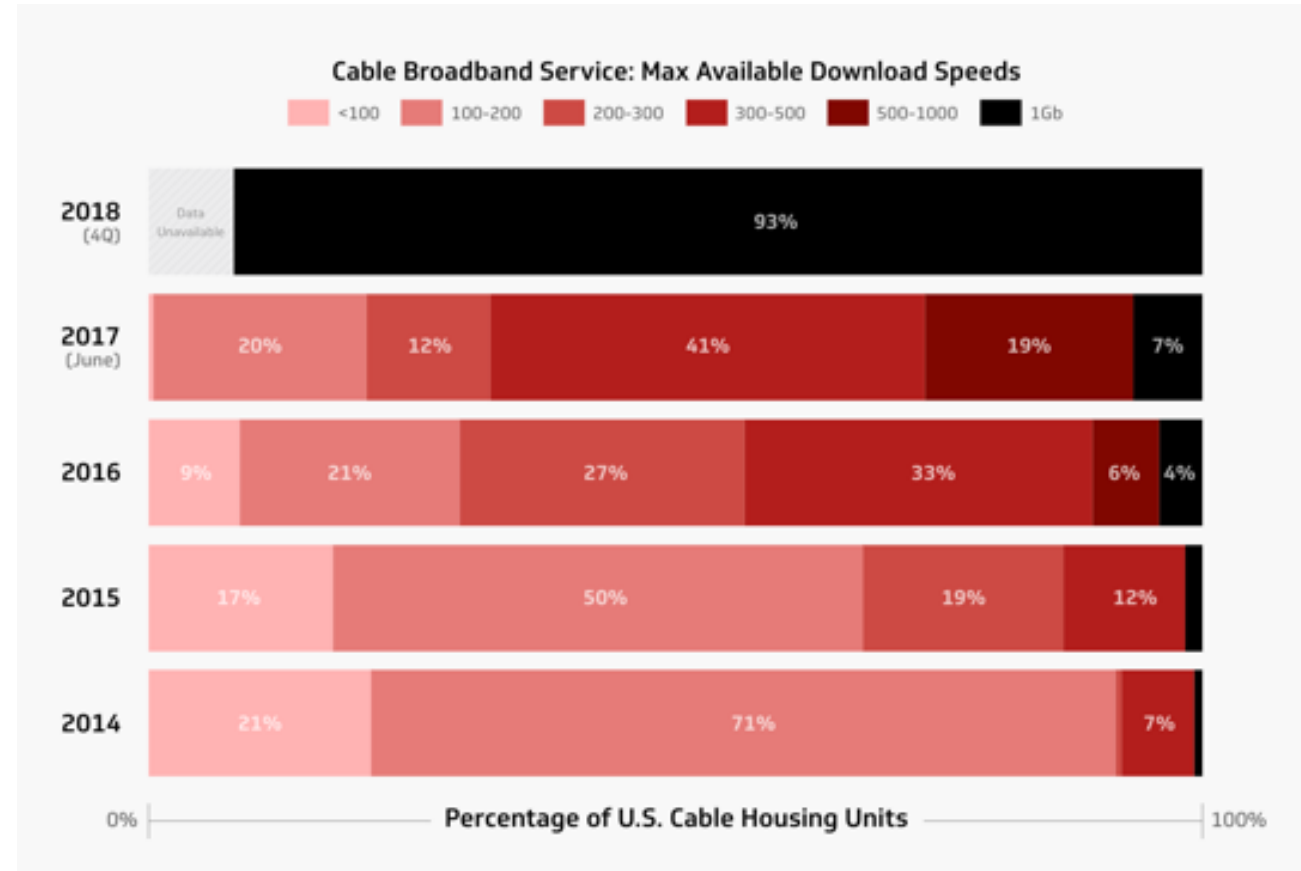
- The vast majority of Idaho's population also has choice in their fixed broadband provider.
- Across all transmission technologies, over 85% of the population has access to two or more fixed broadband providers and over 53% have access to two or more fixed terrestrial broadband providers.
- An examination of housing units provides similar results.

COMPARISON OF OTHER INTERMOUNTAIN WEST STATES

	Fixed Terrestrial Broadband Availability	
State	% Housing Units	% Population
Idaho	83.8%	85.3%
Montana	84.3%	86.3%
Nevada	92.8%	92.7%
Utah	93.2%	94.2%
Wyoming	79.6%	81.2%

CONCLUSION

- The full report from Cable Labs should be available for public distribution by the end of next week.
- Speeds have increased tremendously over the last several years.
- 10G technology is coming.
- The FCC's Digital Opportunity Data Collection proposed order was issued last Thursday. This proposes the use of 'shapefiles' for 'geospatial broadband coverage maps'.



A close-up photograph of a network server rack. The image is dominated by a dense array of blue and yellow Ethernet cables plugged into network ports. The background is slightly blurred, showing more of the server rack and its components. The overall color palette is a mix of vibrant blues and yellows.

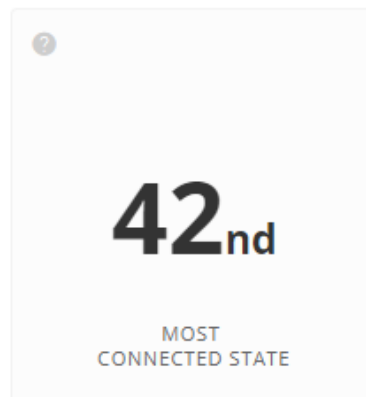
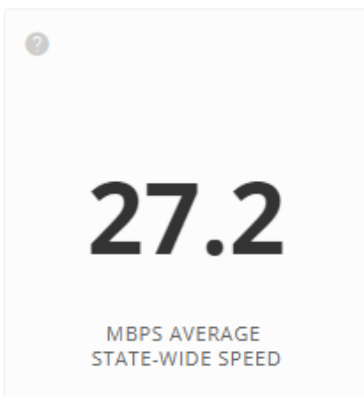
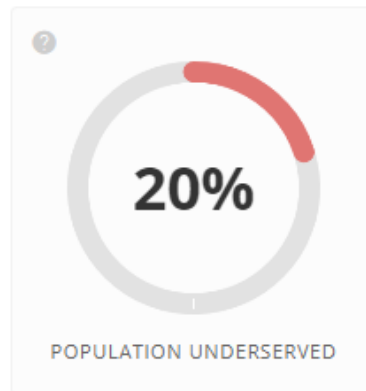
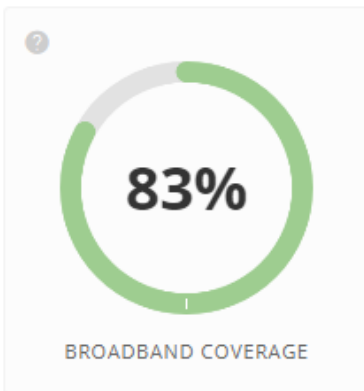
Mapping Update

**Jake Reynolds
Idaho Commerce**

Meeting 2

July 17th 2019

Broadbandnow.com Data



WIRELESS COVERAGE

99.4%

of Idahoans have access to [mobile broadband](#) service.

93.8%

of Idahoans have access to [fixed wireless](#) service.

Source – [broadbandnow.com](#)



Where are the gaps?

Unique zip codes that include people without access to 25mbps wired broadband

- **256,000 total pop.**

At least 75% of total population of zip code does not have access to 25mbps

- **101,000 total pop.**

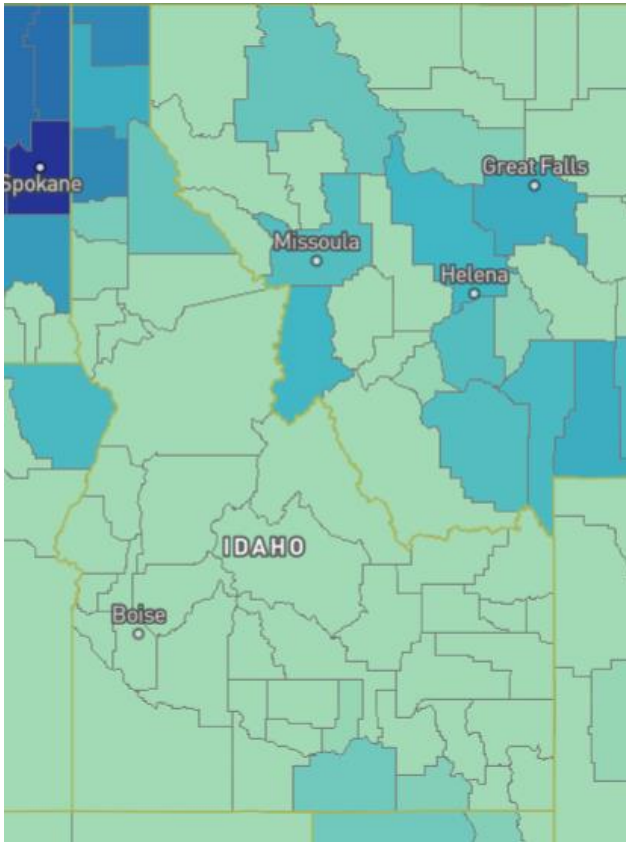
11 population centers in 4 regions exceeding 3,000 each underserved

- **73,000 total pop.**

Between 75% & 50% - additional 17 unique areas excluded in top areas

- **30,000 total pop.**

Fixed Wireless & Satellite

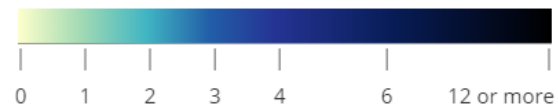


All Providers Reporting Service



Census block ID: 160010001003110

Number of Fixed Residential Broadband Providers



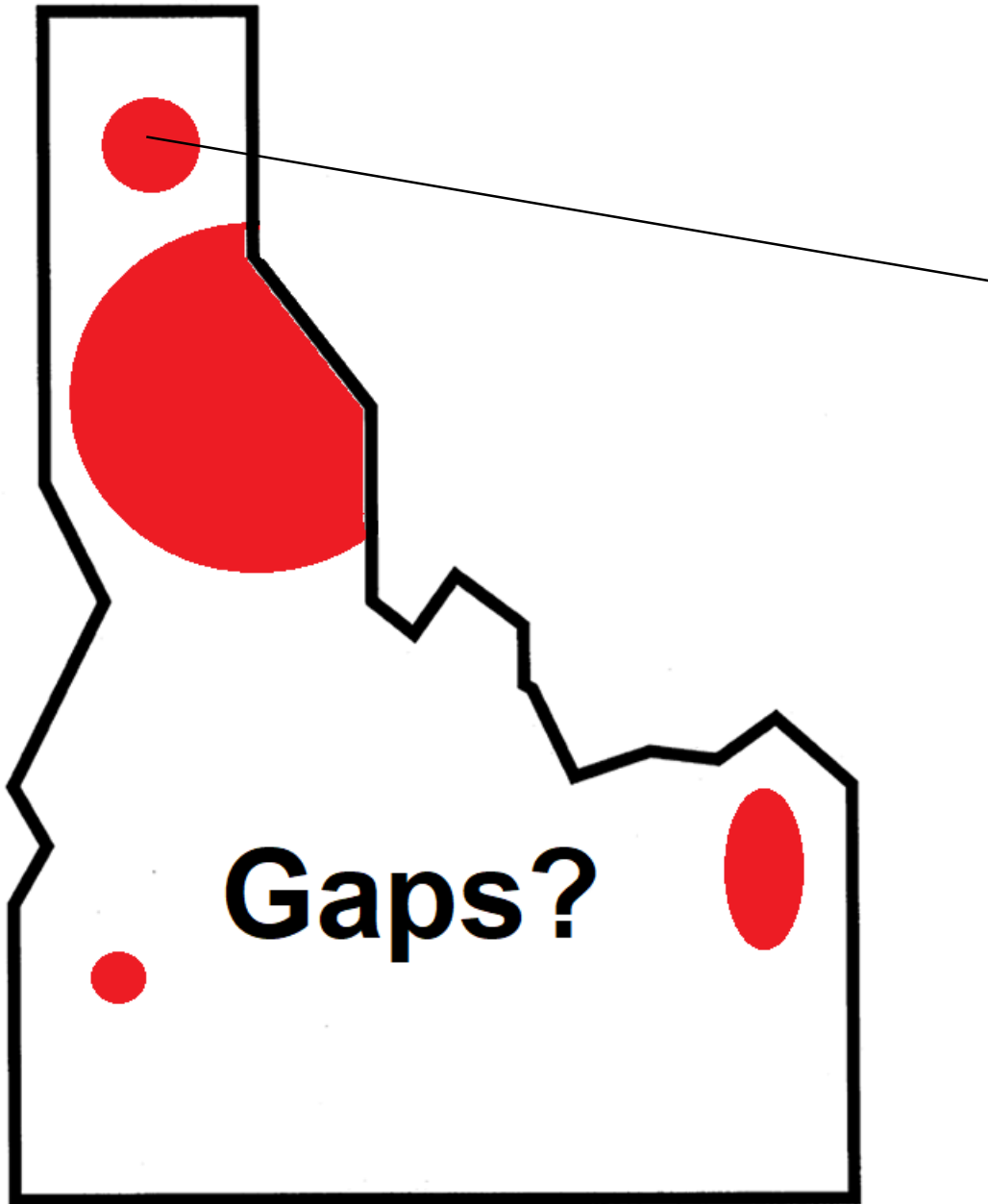
Broadband



Technology Fixed Wireless, Satellite
Speed \geq 25/3 Mbps
Date Dec. 2017 (latest public release)

Source: broadbandmap.fcc.gov/#/

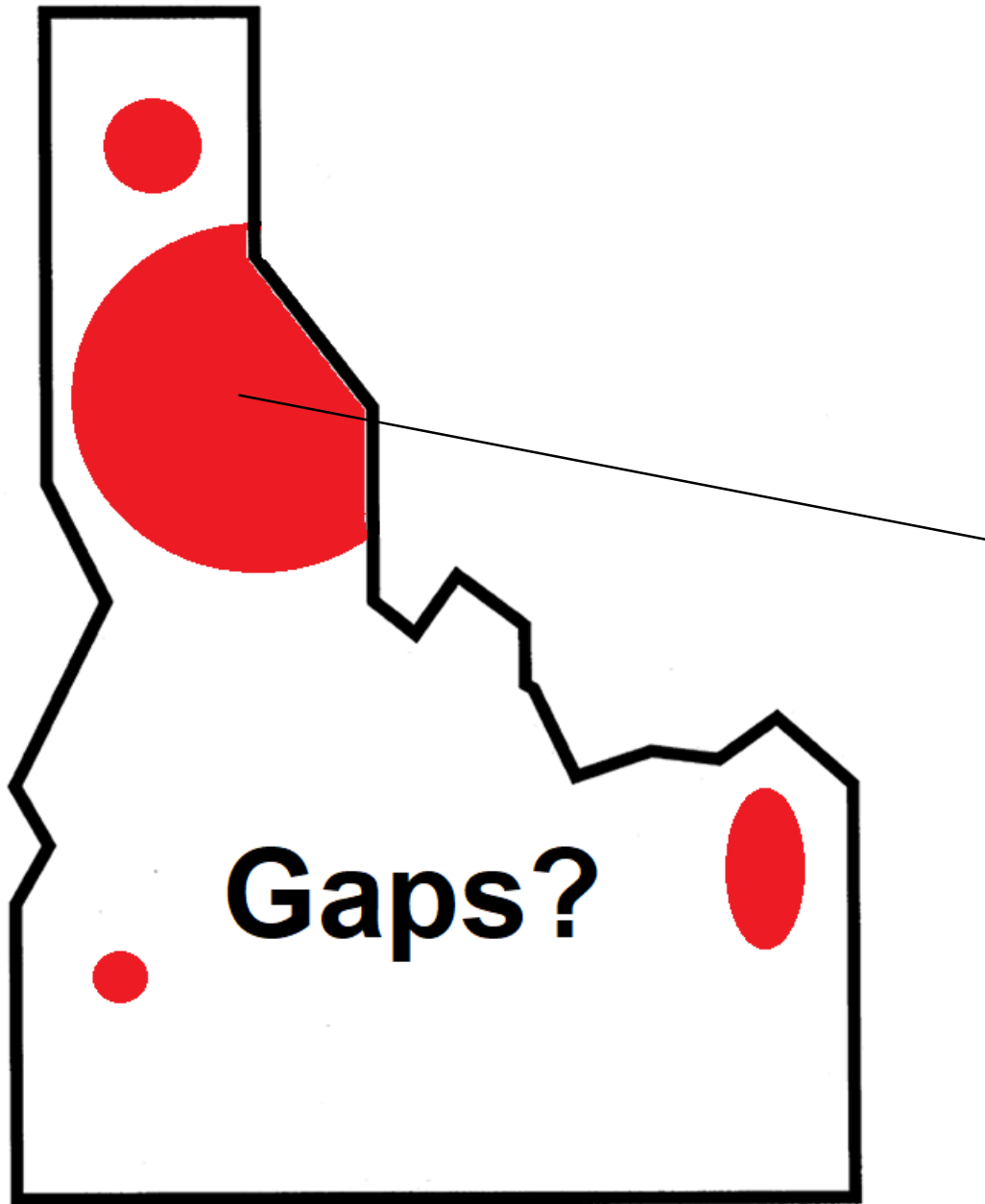




Spirit Lake
Cataldo
Harrison
Medimont
Moyie Springs
Naples

Total Population: **10,123**

Total Population
Under 25mbps: **9,086**

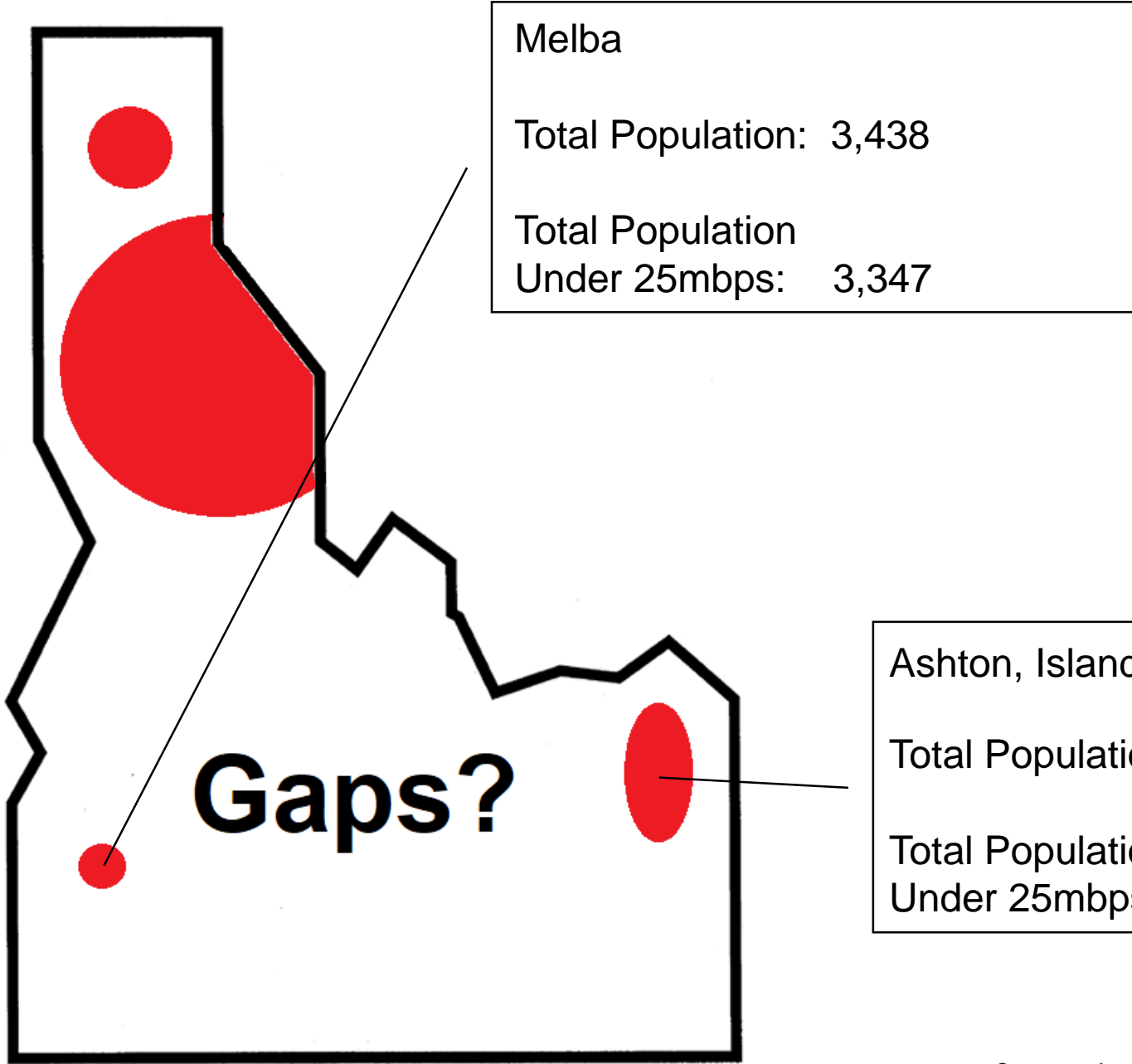


Saint Maries, Plummer, Fernwood
Orofino, Weippe, Lenore
Pierce, Ahsahka
Grangeville, Cottonwood
Kooskia, Stites, Riggins
White Bird, Elk City, Ferdinand
Pollock, Greencreek, Lucile
Potlatch, Genesee, Deary
Viola, Princeton, Harvard
Kamiah, Craigmont, Nezperce
Reubens, Lapwai, Culatesac, Peck
Kellogg, Pinehurst, Wallace
Kingston, Mullan, Smelterville
Calder, Avery, Clarkia

Total Population: **57,513**

Total Population

Under 25mbps: **56,819**



Melba
Total Population: 3,438
Total Population Under 25mbps: 3,347

Ashton, Island Park, Newdale
Total Population: 4,078
Total Population Under 25mbps: 3,786

Clusters by County

Gap Ranking	County	Cities	Population without 25mbps
1	Idaho	Grangeville, Cottonwood, Kooskia, Stites, Riggins, Whitebird, Elk City, Ferdinand, Pollock, Greencreek, Lucile	13544
2	Shoshone	Kellogg, Pinehurst, Wallace, Kingston, Mullan, Smelterville, Calder, Avery, Clarkia	10020
3	Clearwater	Orofino, Weippe, Lenore, Pierce, Ahsahka	9049
4	Benewah	Saint Maries, Plummer, Fernwood	8703
5	Latah	Potlatch, Genesee, Deary, Viola, Princeton, Harvard	6576
6	Kootenai	Spirit Lake, Cataldo, Harrison, Medimont	5625
7	Lewis	Kamiah, Craigmont, Nezperce, Reubens	5264
8	Fremont	Ashton, Island Park, Newdale	3786
9	Nez Perce	Lapwai, Culdesac, Peck	3663
10	Boundary	Moyie Springs, Naples	3461
11	Canyon	Melba	3347

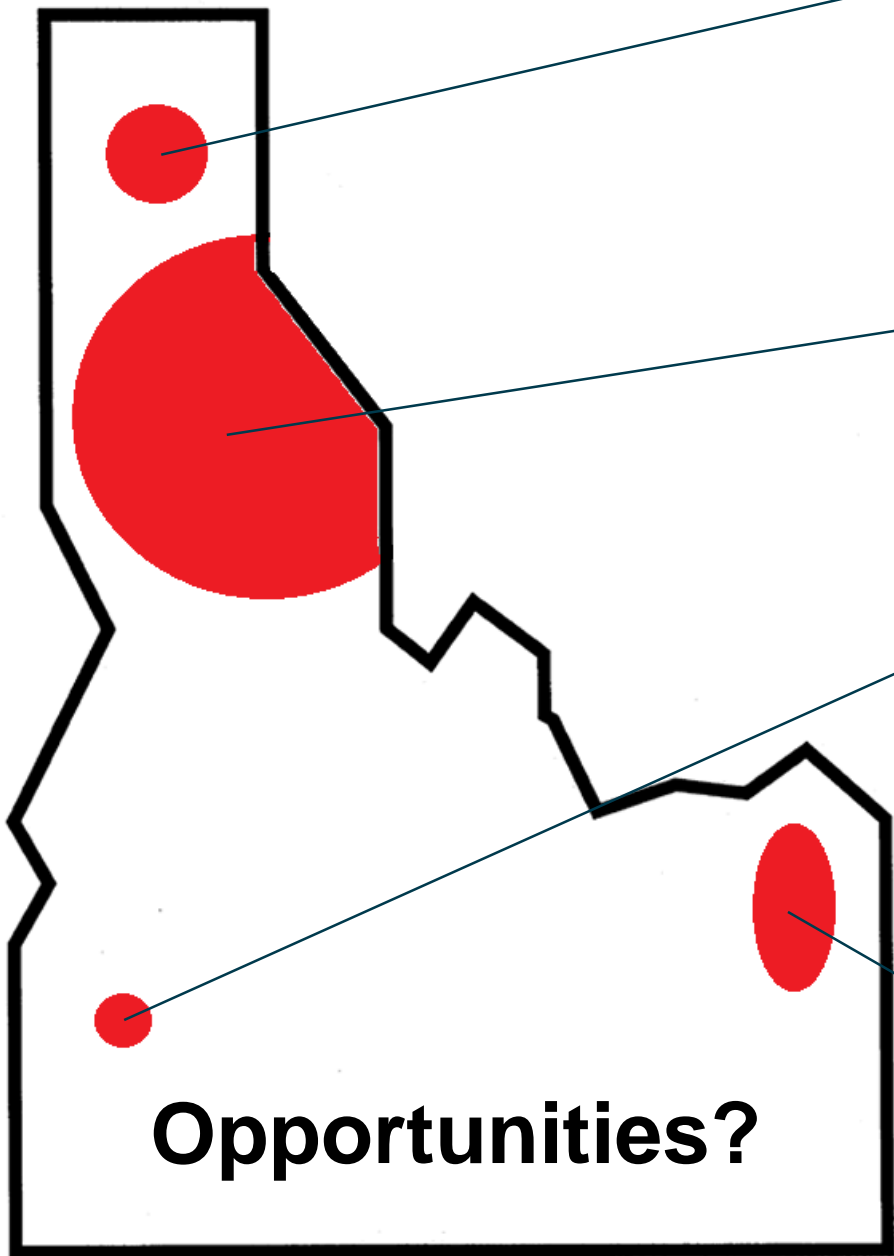
Source – broadbandnow.com



Small Discrepancies?

- Reubens, Idaho – population 117
 - Broadbandnow.com – 100% under 25mbps
 - ISP data \geq 25mbps
- Kamiah, Idaho – population 4,230
 - Broadbandnow.com – 87% under 25mbps
 - ISP data \geq 25mbps
- Lapwai, Idaho – population 2,190
 - Broadbandnow.com – 100% under 25mbps
 - ISP data \geq 25mbps
- Others? More verification needed





North Region Gap

- 5 Public Schools
- 2 Libraries
- Other Facilities?

North Central Gap

- 33 Public Schools
- 25 Libraries
- 20 Hospitals/Clinics
- Other Facilities?

South West Gap

- 2 Public Schools
- Other Facilities?

East Idaho Gap

- 3 Public Schools
- 1 Library
- 1 Hospital/Clinics




IDAHO
COMMERCE