

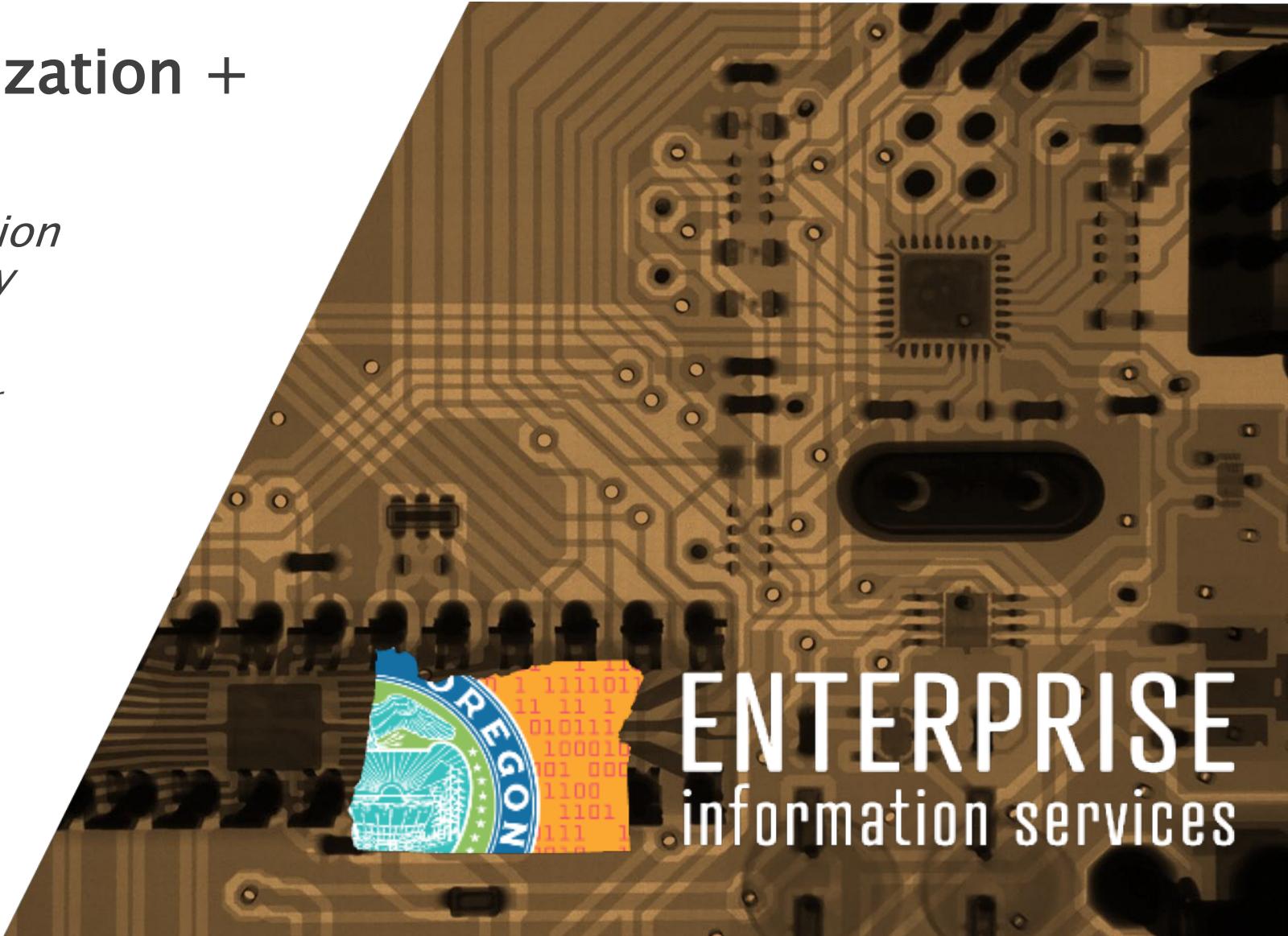
EIS Network Modernization + Link Oregon

*Joint Committee on Information
Management and Technology*

Terrence Woods
State of Oregon Chief Information Officer

Kurtis Danka
Chief Technology Officer

14 April 2021

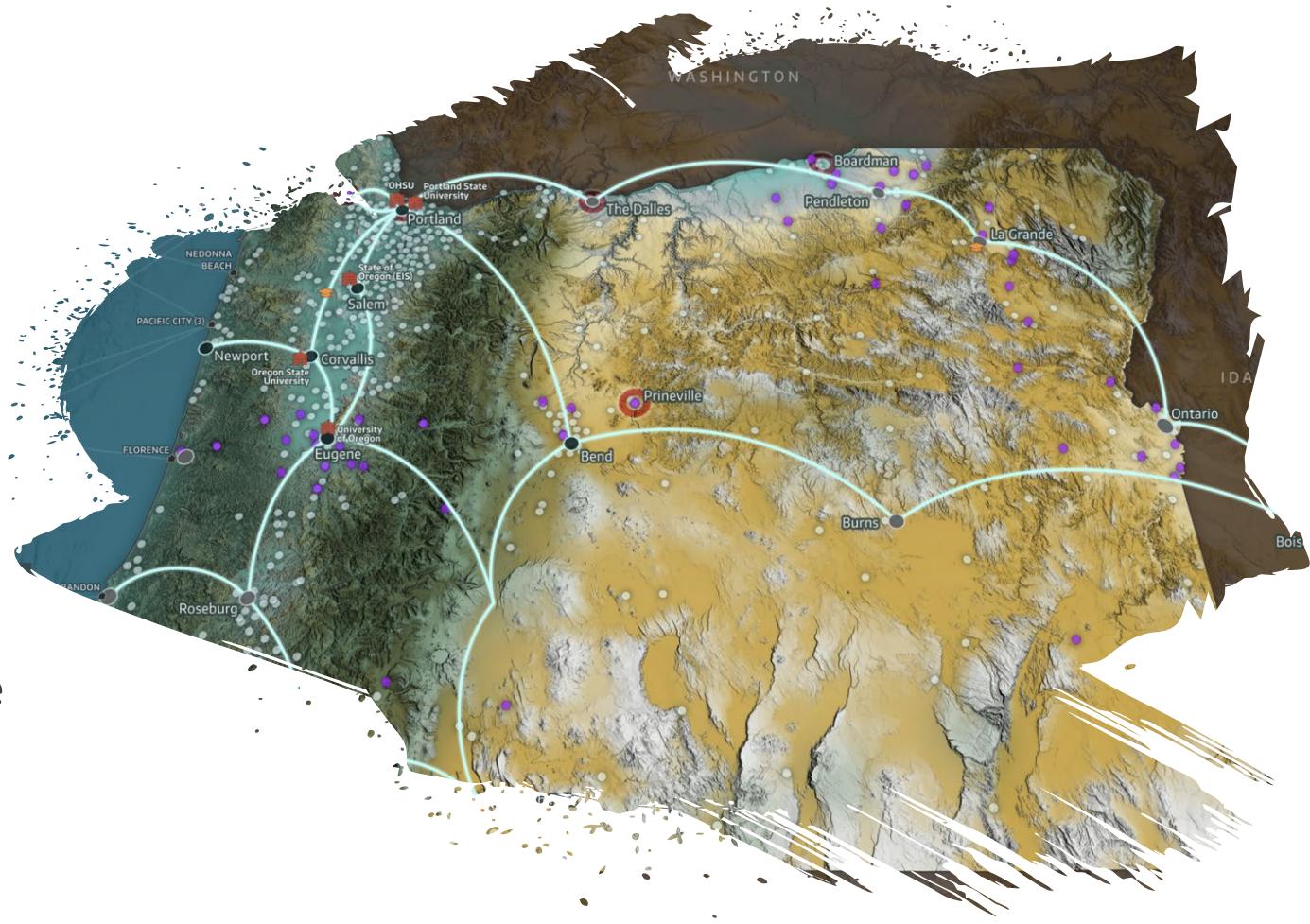


EIS . *Link Oregon Partnership*

- **Fiber Partnership.** Link Oregon was founded by EIS and Oregon's four research universities to acquire existing fiber assets and establish a modern, high-capacity, middle-mile fiber network to serve the needs of Oregon's public and non-profit sectors

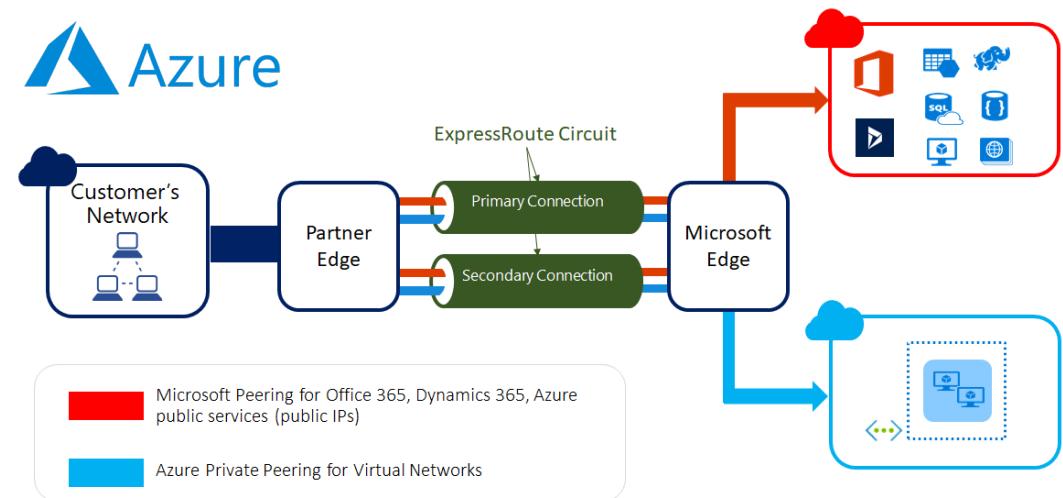


- **Link Oregon Connectivity.** EIS is leveraging its membership in Link Oregon to modernize the state's network—enhancing connectivity, network speeds, and resilience
- **Scope.** EIS is responsible for providing connectivity to 575+ state/branch office locations



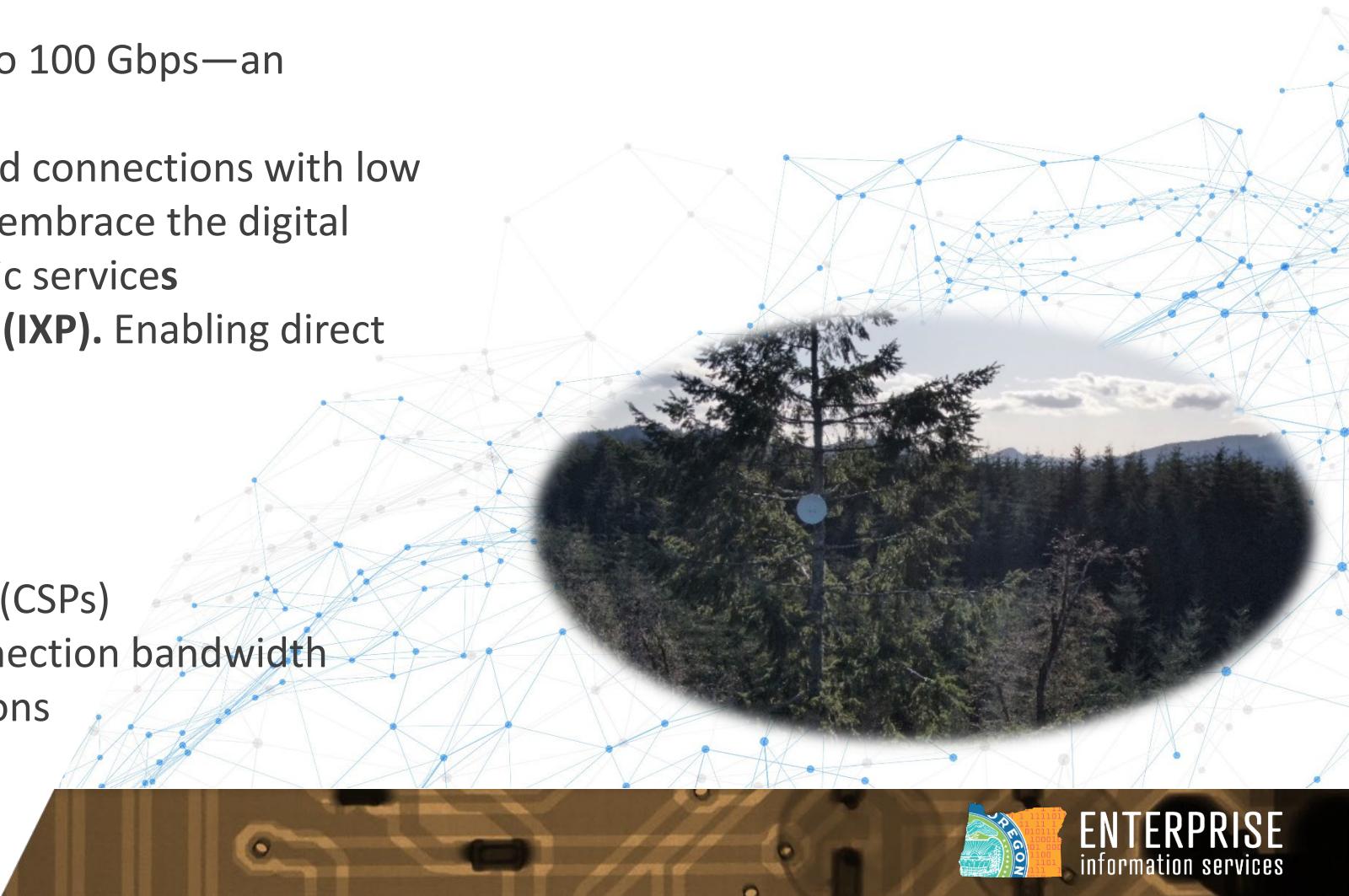
Link Oregon Connectivity. *Progress to Date*

- **10-100 Gbps Core:** Oregon State Offices and Branches will be connected to backbone capable of supporting speeds of up to 100 Gbps
- **Network Designs.** Phase 1 (Willamette Valley) is complete. Phase 2 (Eastern & Southern Rings will be completed by December 2021
- **Network Equipment.** EIS has upgraded network devices to support the new high-speed core
- **Azure ExpressRoute.** EIS, DHS and OHA are utilizing Microsoft Azure ExpressRoute to enable the M365 deployment and the provisioning of cloud workloads (e.g., OHAs contract tracing application and disaster recovery for DHS | OHA Integrated Eligibility)

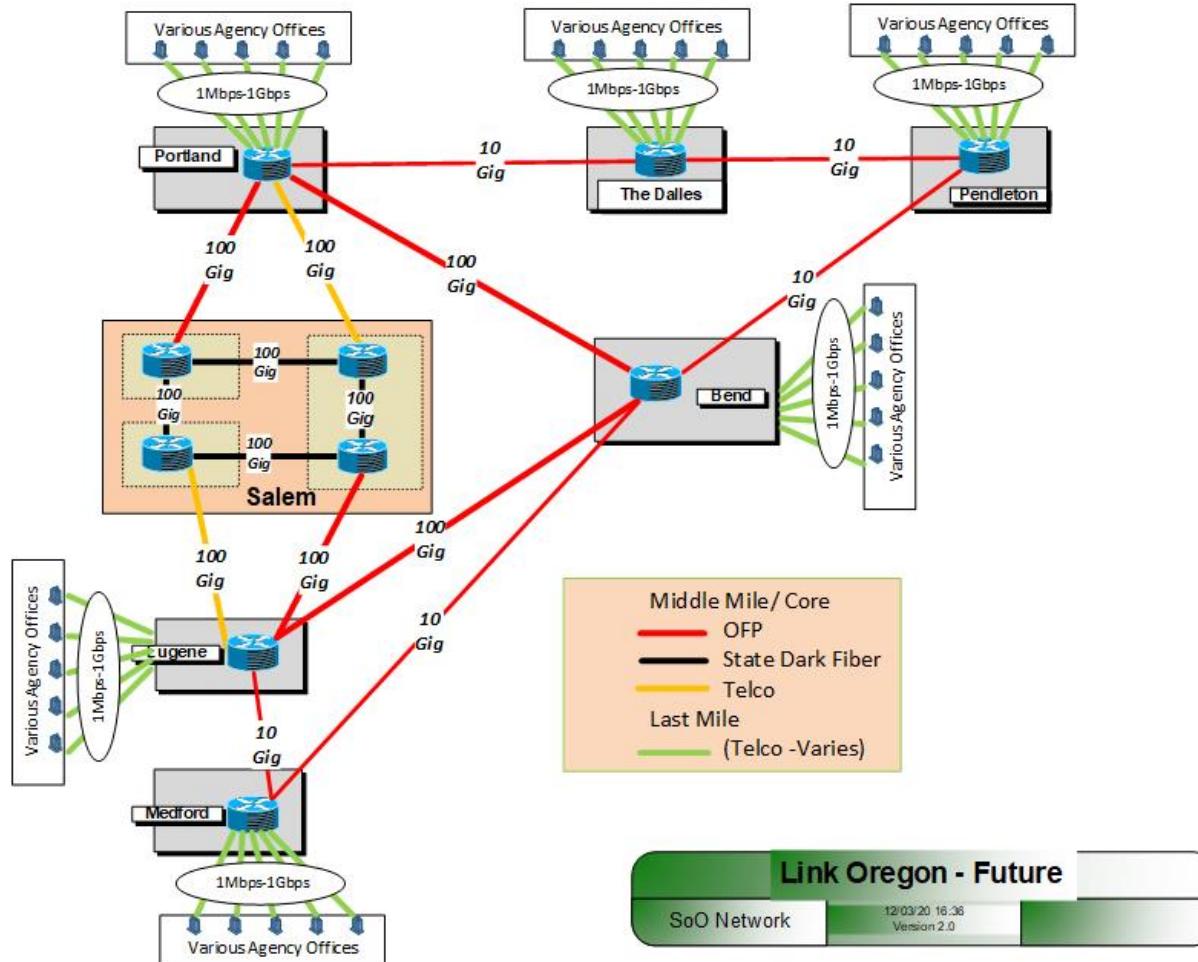


Link Oregon Connectivity. *Future State*

- **Statewide Fiber Network.** Access to a modern, resilient, middle-mile fiber network
- **Enhanced Bandwidth.** Speeds up to 100 Gbps—an increase of 10x to 100x
- **Improved Performance.** High-speed connections with low latency, enabling state agencies to embrace the digital workplace and provide digital public services
- **Cloud or Internet Exchange Points (IXP).** Enabling direct connections (“peering”) with:
 - Microsoft (Azure)
 - Amazon (AWS)
 - Google
 - Other Cloud Service Providers (CSPs)
- **Last-Mile.** Allows for last-mile connection bandwidth increases at State of Oregon locations



Link Oregon Connectivity. *Future State*





LINK OREGON:

High-speed Fiber Broadband for Oregon's Public & Non-profit Sectors

**Joint Legislative Committee On Information
Management and Technology (JLCIMT)**

Steve Corbató – Executive Director

April 14, 2021



What is LINK OREGON?

- A non-profit consortium (Oregon Fiber Partnership) of state government and the four public research universities to support the public and non-profit sectors
- An advanced, statewide middle-mile network using mostly existing dark fiber assets to provide cost-effective, high-speed connectivity for our members
- Our network will address some short-term challenges presented by the pandemic and bring Oregon on par with the peer network capabilities and resiliency of other Western states.
- Our partner ecosystem includes:
 - STATE: Broadband Office, EIS, ODE, HECC, State Library, ODOT, PUC
 - EDUCATION: P/K-12, community colleges, four-year/research universities
 - HEALTHCARE: Public/non-profits hospitals & clinics, telehealth, OCHIN
 - COMMUNITIES: Urban, rural, and Tribal
 - COMMERCIAL: Telecommunications providers, data centers
 - FEDERAL: NTIA (Commerce), FCC, USDA, NSF

Why LINK OREGON?

Business Qualifications

- Community engagement across all Oregon counties and with Tribes
- Already serving ~30% of Oregon school districts and ESDs through the integration of former NERO network
- Middle-mile fiber partnerships with five commercial providers (telcos)
- Last-mile partnerships with ten commercial service providers (telcos) and five cities & counties
- We are working with strategic partners on the plan for an *Oregon Learning and Telehealth Network* (white paper: "[Leave No Oregonian Offline](#)")

Technical and Operating Qualifications

- Extensive fiber footprint: 2,700+ route miles
- Statewide Ethernet-based transport
 - Support the wide area networks of founding partners
- Comprehensive Internet service
 - Local traffic exchanges: NWAX (metro Portland), WIX (Eugene), SIX (Seattle)



LINK OREGON

10,000 ft

7,500

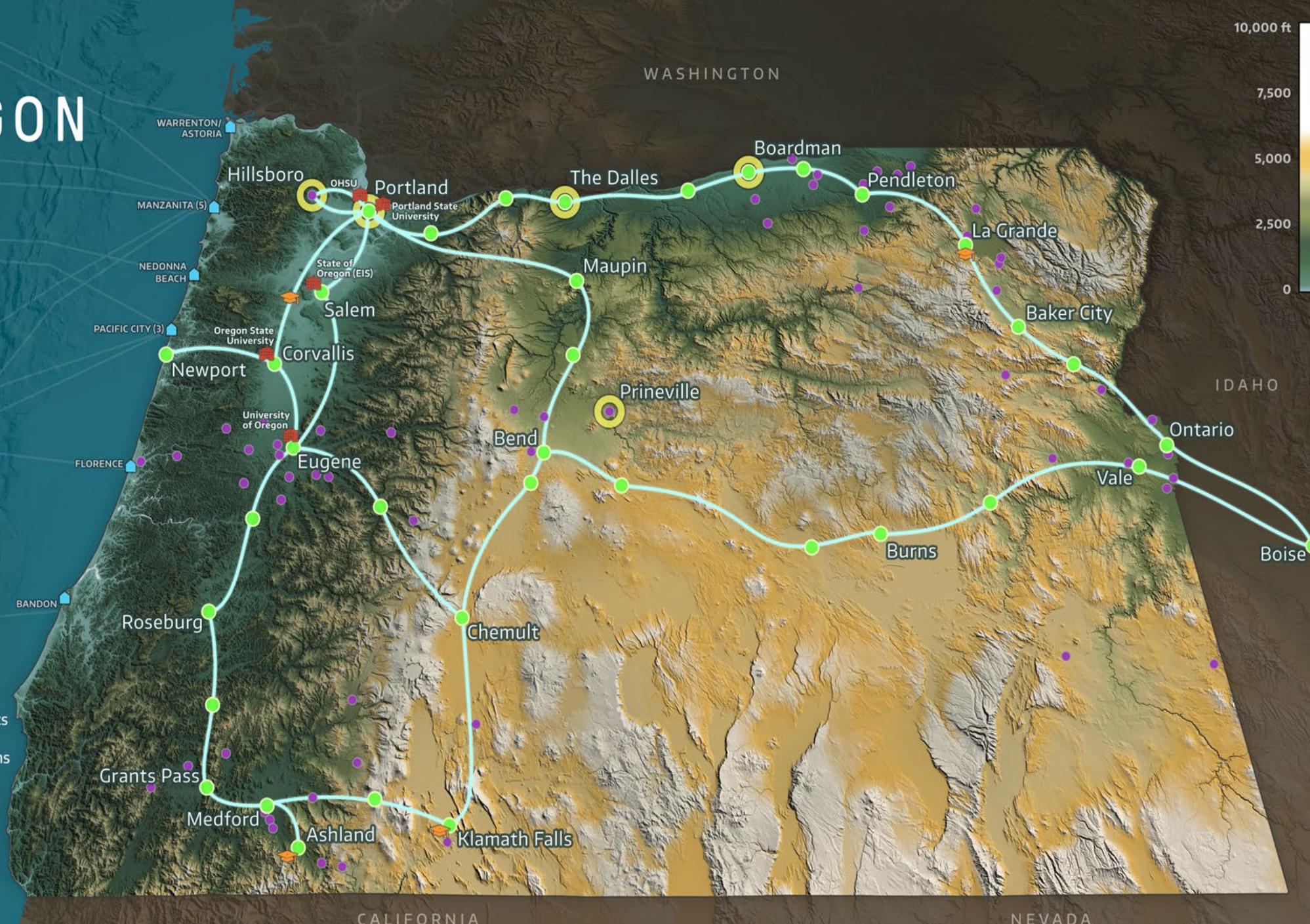
5,000

2,500

0

PACIFIC
OCEAN

- Fiber Broadband Routes
- Current Service Locations
- Link Oregon Founding Entities
- Technical & Regional Universities
- Link Oregon Connected School Districts
- Commercial Data Center Concentrations
- Transoceanic Cables
- Transoceanic Cable Landing Points



Strategic and Sustainable Governance

A Non-profit Organization

- Oregon non-profit with federal tax-exempt status (501c3)
- Asset vessel and operational entity
- Vehicle for other collaborative information technology projects
- **Public-private partnership** at its core through collaboration with commercial and municipal service providers

Board of Directors

- **State Government**
 - **Terrence Woods, State CIO, EIS (Chair - FY21)**
 - Kurtis Danka, State CTO, EIS
 - Peter Tamayo, CIO, Department of Education
 - Kristen Sheeran, Governor's Office
- **Research Universities**
 - Bridget Barnes, VPIT/CIO, OHSU
 - Andrea Ballinger, CIO, OSU (Vice chair - FY21)
 - Kirk Kelly, VPIT, PSU
 - Jessie Minton, CIO, UO (Treasurer)
- **Others**
 - Stuart Long, CIO, Cascade Technology Alliance (K-12)
 - LINK OREGON Executive Director (*ex officio*) + up to two open seats

Support for Public & Non-Profit Organizations

LINK OREGON works closely with state, county, and municipal government organizations, as well as with state research universities and research facilities, to support their needs and the needs of the communities they serve.

The need for improved connectivity, particularly in remote rural communities, predates COVID-19, but has been clearly exacerbated by the pandemic.

These include:

- State and local government agencies
- K-12 education, through school districts & Educational Service Districts (ESDs)
- Healthcare facilities (public and non-profit)
- Higher education: public universities, private baccalaureate colleges and universities, community colleges
- Public libraries
- Federally recognized Tribes
- Other community anchor institutions

Current Network Expansion Status

LINK OREGON is engaged concurrently in the two initial phases of its fiber broadband expansion.

- Mission directly addresses urgent needs presented by COVID-19 for connectivity to support in-home schooling, telehealth, and access to other public information and services, particularly in remote, rural communities in southern and eastern Oregon.

Phase 1

- Connectivity throughout the Willamette Valley, Newport and central Oregon
- Initiated partnerships with Fujitsu (optronics), Arista (routers), and Lumen/CenturyLink, Zayo, Hunter, Bend Broadband, and PEAK/Pioneer for long-haul fiber

Phase 2

- Connectivity to communities and Tribes across southern and eastern Oregon
- Partnership with State Broadband Office, Department of Education, and Enterprise Information Services
- Fiber lateral segments in Pendleton, Boise, and Klamath Falls plus other cities in eastern and southern Oregon



LINK OREGON

10,000 ft

7,500

5,000

2,500

0

PACIFIC
OCEAN

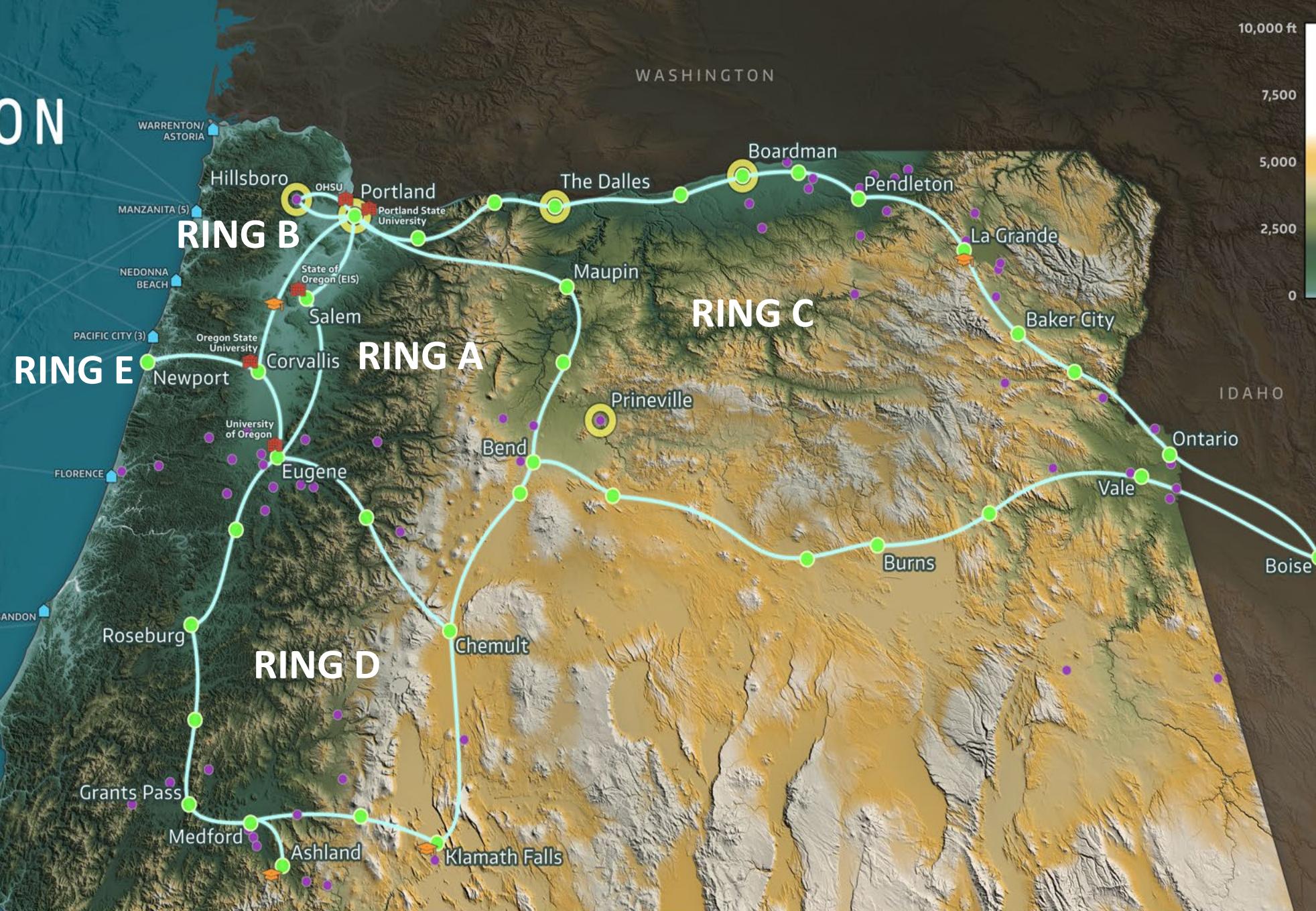
WASHINGTON

IDAHO

CALIFORNIA

NEVADA

- Fiber Broadband Routes
- Current Service Locations
- Link Oregon Founding Entities
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Link Oregon Statewide Access Locations - 49 as of early 2021

Site Name	Site Address	Site Type	Latitude	Longitude	Colocation Provider
Arlington	Cedar Springs Ln & Hwy 19, Arlington OR 97812	Optical Only	45.63272	-120.16503	Zayo
Ashland	1250 Siskiyou Blvd, Ashland OR 97520	Internet/MPLS/Optical	42.18596	-122.69448	Southern Oregon University
Baker City	2120 3rd St, Baker City OR 97814	Internet/MPLS/Optical	44.77885	-117.83295	Windwave
Bend (ODOT)	63055 North Hwy 97, Bend OR 93077	MPLS/Ethernet Satellite	44.08993	-121.30656	State of Oregon (Dept. of Transportation)
Bend (Vault)	20845 Sockeye Place, Bend OR 97701	Internet/MPLS/Optical	44.08622	-121.28284	TDS One Neck
Boardman	71202 Wilson Ln, Boardman OR 97818	Optical Only	45.82746	-119.66923	Zayo
Boise (Idaho)	434 W McGregor Dr, Boise ID 83705	Internet/MPLS/Optical	43.56704	-116.18451	Lumen (Internet2/IRON)
Burns	64 W B St, Burns OR 97720-1550	Internet/MPLS/Optical	43.59095	-119.05516	Lumen
Central Point	800 Enterprise Dr, Central Point OR 97502	Optical Only	42.38669	-122.87029	Hunter
Chemult	109110 Hwy 97 N, Chemult OR 97731	Optical Only	43.21330	-121.78239	Lumen
Clackamas	13455 SE 97th Ave., Clackamas OR 97015 8662	Optical Only	45.42696	-122.56359	Clackamas ESD
Corvallis (OSU Kerr)	1500 SW Jefferson Way B306, Corvallis OR 97331	Internet/MPLS/Optical	44.56408	-123.27474	OSU
Corvallis (OSU PASC)	3531 SW Campus Way, Corvallis OR 97330	Internet/MPLS/Optical	44.56696	-123.28969	OSU
Drain	701 Division St, Drain OR 97435	Optical Only	43.65995	-123.32357	Hunter
Drewsey	US Hwy 20 & Mile Post 174, Drewsey OR 97904	Optical Only	43.78320	-118.34184	Lumen
Durkee	29094 Old Hwy 30, Durkee OR 97905	Optical Only	44.58177	-117.46398	Lumen
Eugene (UO Oregon Hall)	1585 East 13th Ave, Eugene OR 97403	Internet/MPLS/Optical	44.04617	-123.07044	UO
Eugene (WIX)	859 Willamette Street, Eugene OR 97401	Internet/MPLS/Optical	44.05052	-123.09248	Lane Council of Governments
Fish Lake	Hwy 140, Eagle Point OR 97524	Optical Only	42.38987	-122.34436	Hunter
Glendale	Windy Creek Road, Glendale OR 97442	Optical Only	42.78269	-123.36169	Hunter
Grants Pass	624 SE J St, Grants Pass OR 97526	Internet/MPLS/Optical	42.43503	-123.32029	Hunter
Hermiston	290 West Punkin Center Road, Hermiston OR 97838	Internet/MPLS/Optical	45.86526	-119.29406	Intermountain ESD
Hillsboro	5737 NE Huffman St, Hillsboro OR 97124	Internet/MPLS/Optical	45.55800	-122.91700	Flexential
Klamath Falls	1320 Klamath Avenue, Klamath Falls OR 97601	Internet/MPLS/Optical	42.22770	-121.77635	Hunter
La Grande (EOU)	14101 Ave, La Grande OR 97850	MPLS/Ethernet Satellite	45.32186	-118.09125	Eastern Oregon University
La Grande (Lumen)	58902 Foothill Rd, La Grande OR 97850	Optical Only	45.26278	-118.04612	Lumen
Madras	91 SW Dover Ln, Madras OR 97741-8899	Optical Only	44.59228	-121.13025	Lumen
Maupin	50500 US-HWY 197, Maupin OR 97037	Optical Only	45.04657	-120.99836	Lumen
Medford (Lumen)	502 North Central Ave, Medford OR 97501	MPLS/Ethernet Satellite	42.33073	-122.87578	Lumen
Medford (SOESD)	101 North Grape Street, Medford OR 97501	MPLS/Ethernet Satellite	42.32625	-122.87634	Southern Oregon ESD
Millican	29880 Highway 20, Bend OR 97701	Optical Only	43.87105	-120.83524	Lumen
Modoc Point	16001 Algoma Rd, Klamath Falls OR 97601	Optical Only	42.37062	-121.80250	Lumen
Newport	2030 SE Marine Science Drive, Newport OR 97365	Internet/MPLS/Optical	44.62149	-124.04401	OSU (Hatfield Marine Science Center)
Oakridge	76228 Fish Hatchery Rd, Oakridge OR 97463-9691	Optical Only	43.74204	-122.44383	Lumen
Ontario (Lumen CO)	SI 2nd St & E Island Rd, Ontario OR 97194	MPLS/Ethernet Satellite	44.02527	-116.96631	Lumen
Ontario (Lumen ILA)	225 SW 2nd St, Ontario OR 97194	Optical Only	44.02500	-116.96635	Lumen
Parkdale	54501 lost Lake Rd, Hood River OR 97031	Optical Only	45.57165	-121.64834	Zayo
Pendleton (IMESD)	2001 SW Nye, Pendleton OR 97801	Internet/MPLS/Optical	45.65375	-118.80313	Intermountain ESD
Pendleton (Lumen CO)	237 SW 1st St, Pendleton OR 97801	MPLS/Ethernet Satellite	45.65390	-118.80314	Lumen
Portland (Northrup)	1335 NW 14th Ave, Portland OR 97209	Optical Only	45.53257	-122.68567	Lumen
Portland (Pittcock)	921 SW Washington, Portland OR 97205	Internet/MPLS/Optical	45.52156	-122.68076	Pittcock Block
Portland (PSU FAB)	1900 SW 4th Ave, Portland OR 97201	Internet/MPLS/Optical	45.50927	-122.68092	PSU
Riley	Milepost 100 US Hwy 20, Burns OR 97720	Optical Only	43.54027	-119.58926	Lumen
Roseburg	2350 NW Aviation, Roseburg OR 97470	Optical Only	43.23792	-123.35971	Douglas Fast Net (Hunter)
Salem (Revenue Building)	955 Center Street NE, Salem OR 97301-2555	Internet/MPLS/Optical	44.94168	-123.02773	State of Oregon (Dept. of Revenue)
Salem (State Data Center)	530 Airport Rd SE, Salem OR 97301-5068	Internet/MPLS/Optical	44.92626	-123.00201	State of Oregon (EIS)
Sandy	39250 Pioneer Blvd, Sandy OR 97055	Optical Only	45.39639	-122.25887	City of Sandy (Sandy Net)
Sunriver	17990 South Century Drive, Bend OR 97707	Optical Only	43.86370	-121.43891	TDS Bend Broadband
The Dalles (City Hall)	313 Court St, The Dalles OR 97058	MPLS/Ethernet Satellite	45.60171	-121.18381	City of The Dalles (Q-Life)
The Dalles (Zayo ILA)	3112 W 2nd St, The Dalles OR 97058	Optical Only	45.62090	-121.21146	Zayo
Vale	3651 Lytle Blvd, Vale OR 97918-5638	Optical Only	43.96254	-117.23145	Lumen



LINK
OREGON

PRELIMINARY NETWORK EXPANSION CONSIDERATIONS - PHASE 3

WASHINGTON

10,000 ft

7,500

5,000

2,500

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PACIFIC
OCEAN

ENTERPRISE

IDAHO

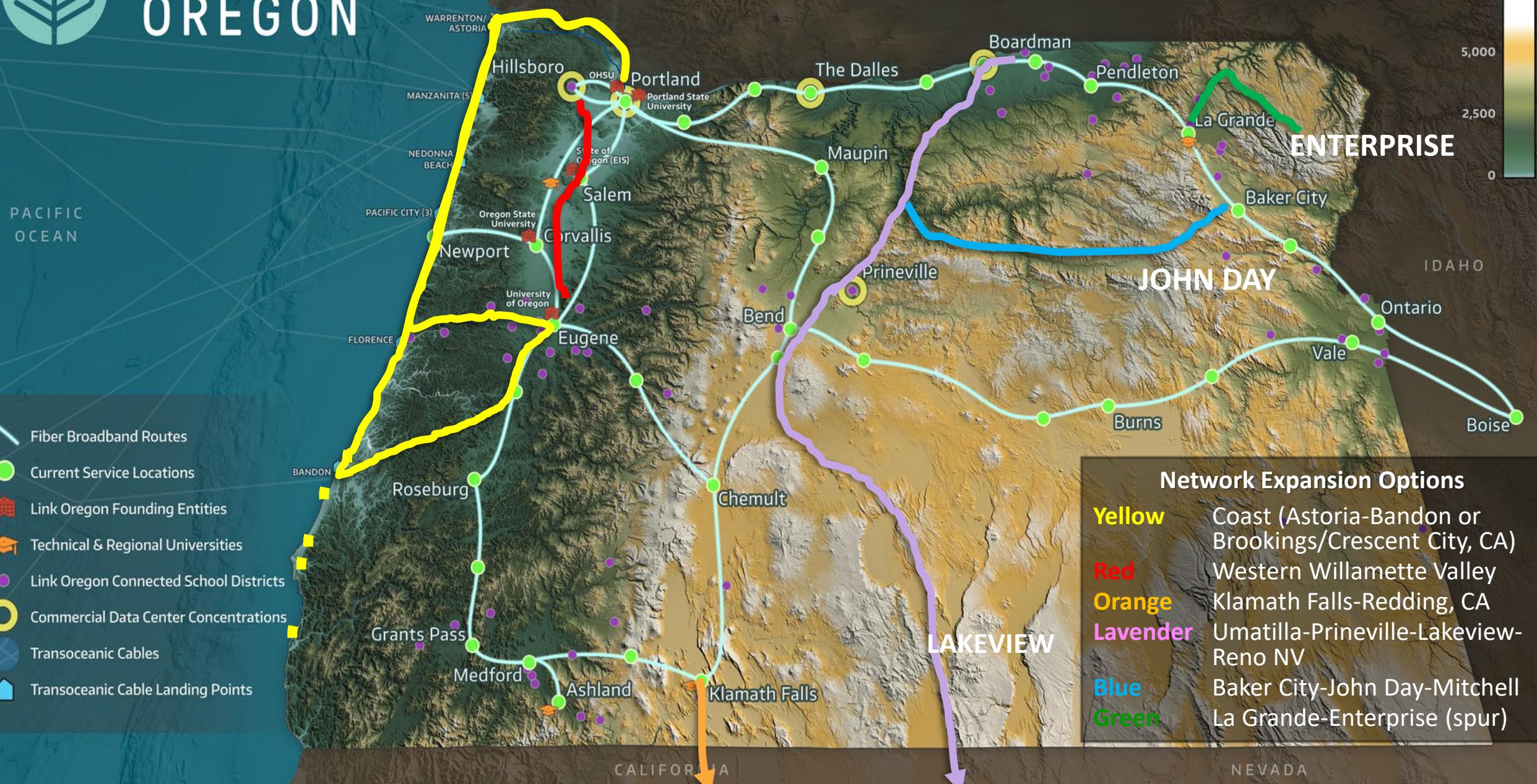
JOHN DAY

Ontario

Vale

Boise

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THANK YOU

Steve Corbató

Executive Director

LINK OREGON

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