Welcome

Introduction – Chris Heimgartner, General Manager

Broadband 101 Presentation – Andrew Entrikin, Director of Broadband and Power Supply

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Whatcom PUD Broadband 101 Agenda

1. What is Broadband | Slides 1-12
   1. How did we get here?
      1. Timeline
      2. Whatcom PUD Model
   2. The Issue
   3. Policy Goals
   4. Partnerships

2. Review Funding Awards in Whatcom County | Slides 13-14
   1. Current Federal/State/local project areas

3. Point Roberts Project | Slides 15 – 19
   1. Budget
   2. Operations Plan

4. Next Steps | Slides 20-23
   1. BEAD

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Whatcom PUD Broadband 101 Timeline

1. Sep 28 2021 – Commission Approves CERB application and in the event such application is approved, the General Manager is authorized to enter into an agreement for such funding.

2. November 2021 - the PUD secured the $50,000 Community Economic Revitalization Board (CERB) Broadband Planning Grant.

3. Dec 14, 2021 - Matching dollars were approved in the 2022 budget (pg 16) for $12,500 allocated from the ALCOA Reserve Fund.

4. March 23, 2022 Feasibility Study Contract Executed with CERB.

5. April 2022 – PUD/Port staff consider completing the CERB feasibility study "in-house" as a Task Order under the Steering Committee's ILA

6. May 2022 - PUD staff seeks two outside consultants (NoaNet and Petrichor)
   1. Consulting Agreement with Petrichor to fulfill CERB study requirements
      (https://deptofcommerce.app.box.com/v/cerbrbminplanrequirements)
   2. Amendment to existing agreement with NoaNet to fulfill Commission's request to consider becoming and ISP
      1. This work will also include looking at the establishment of a "local ISP" that will help the PUD define its' role in the future buildout of a fiber network in the county. – Sep 2021 Commission Meeting

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Whatcom PUD Broadband 101 Timeline

7. Nov 22, 2022 – Staff presents findings from the CERB Study (https://www.pudwhatcom.org/wp-content/uploads/2022/11/Whatcom-PUD-Final-Broadband-Feasibility-Study.pdf)
    - Publicly owned and operated lit retail service network modeled by Noanet
    - Publicly owned and operated dark fiber model by Petrichor Broadband
    - Staff recommendation to proceed with 100% grant and dark fiber infrastructure systems served by a third party ISP.

8. January 2023 - Whatcom PUD submits a Washington State Broadband Office (WSBO) grant for Point Roberts Fiber-To-The-Premise (FTTx) project.

9. October 2023 - WSBO/PUD execute funding contract

7. January 2024 - Whatcom PUD approves contract with design engineering firm

8. February 27, 2024 – Commission approves MSA and SOS

9. June 25th 2024 – Staff will seek Commission approval for PSE Pole Attachment Agreement

10. Oct 2024 - Broadband Equity Access and Deployment (BEAD) NOFO anticipated

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Whatcom PUD Broadband 101

1. The fiber is wholesale infrastructure only; it does not provide retail service in any capacity.
2. Each internet Service Provider (ISP) owns its own customer relationships, directly selling, marketing, and billing its customers.
3. All capital dollars are sourced from a third party. (100% Grant, LUD, etc.)
4. All O&M and capital replacement are collected in our Monthly Recurring Charge (MRC)

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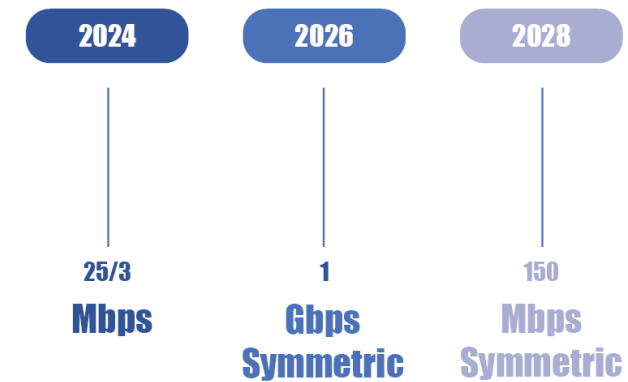PUD

What is Broadband?
WA State

DSL was once the definition of broadband

Current WA State Broadband Speed Goals = 150/150 Symmetrical by 2028

In 10 years there will be a new definition
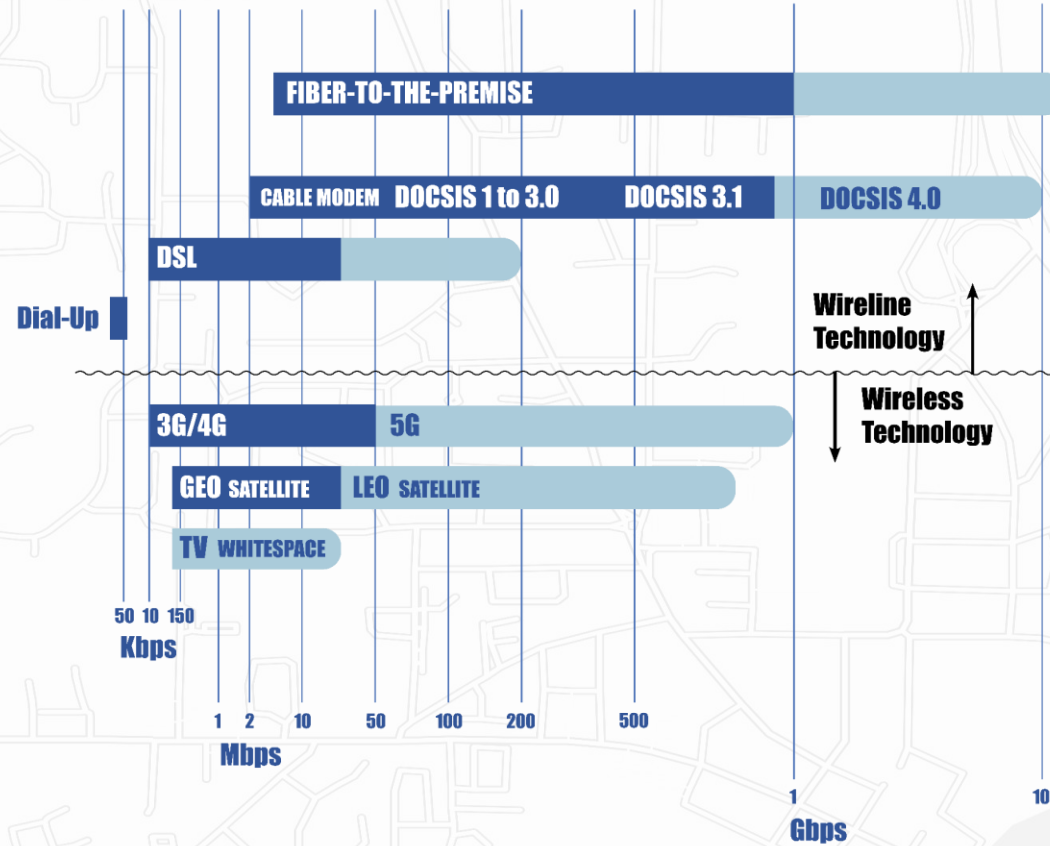
Source: WA State Broadband Office (WSBO) Speed Goals

WA State Broadband Speed Goals

2024	2026	2028
25/3 **Mbps**	1 **Gbps Symmetric**	150 **Mbps Symmetric**

■ All businesses and residences have access to broadband at 25 Mbps download + 3 Mbps upload

■ All communities have access to 1Gbps symmetric service at schools, libraries, hospitals and gov't buildings

■ All businesses and residences have access to broadband at 150 Mbps symmetric service

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Wireline and Wireless Capacity

Wireline and Wireless Capacity

FIBER-TO-THE-PREMISE

CABLE MODEM — DOCSIS 1 to 3.0 — DOCSIS 3.1 — DOCSIS 4.0

DSL

Dial-Up

Wireline Technology

Wireless Technology

3G/4G — 5G

GEO SATELLITE — LEO SATELLITE

TV WHITESPACE

50 10 150
Kbps

1 2 10 50 100 200 500
Mbps

1
Gbps

10

Technology at a mature state of deployment

Technology deployed in select markets or in early stage of deployment

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Source: Illustration inspired by Benton Institute for Broadband & Society

What do we do?

Picture of a directional bore machine that will plow in innerduct and fiber is blown through that. We put in that innerduct and fiber.

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The Issue

Change in Whatcom County BEAD Eligible Locations | June 2022 – June 2023

	Jun-22	Dec-22	June-23	% Change
Total BSL's	83,249	83,805	84,611	2%
Served	68,782	70,635	71,832	4%
Cable	65,436	69,333	70,298	7%
Fiber	20,460	13,691	12,971	-37%
Licensed Fixed Wireless	4,636	6,114	7,125	54%
Underserved	6,639	2,007	3,641	-45%
Unserved	7,828	11,163	9,138	17%

- # of address locations in Whatcom County minus incorporated areas
- Spread out, low population
- We have 5 different companies in our county (WAVE, Lumen, Comcast, Ziply, Pogozone)

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Why aren't unserved customers served?

Industry is highly competitive, lower margin, and faster moving than ever before.

The private sector can't achieve a 3 year ROI on capital in rural areas.

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PUD's Role
Commission Policy Goals

Advance the community wide strategy in making broadband available to underserved areas of Whatcom County

Strategy BB 1 - Develop workplan for the underserved areas of the County with the Port.

Strategy BB 2 - Develop a 'Plan of Finance' for the PUD's responsibility in expanding fiber infrastructure.

Strategy BB 3 - Develop approaches that successfully increase broadband competitive offerings in areas served by a single provider

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Memberships/Partnerships

SHLB is one of the leading national champions for open, affordable broadband for community anchor institutions. SHLB participates regularly in proceedings before the FCC, Capitol Hill, and Executive Branch.

Federal Support

NoaNet, WSAC, Petrichor

State Support

Port/PUD/County Steering Committee

Local Support

Parts of the Internet

Middle Mile

Long Haul

Blaine
Lynden
Nooksack
Bellingham

Harbour Centre, BC

Westin, Seattle

Pittock Building, OR

Last Mile

Customer Premise
Wall Mount

NETWORK ELECTRONICS & OPTICAL SPLITTERS

FIBER TERMINATION PANELS

Distribution Fiber

Drop

Colocation facilities

Fiber Tap

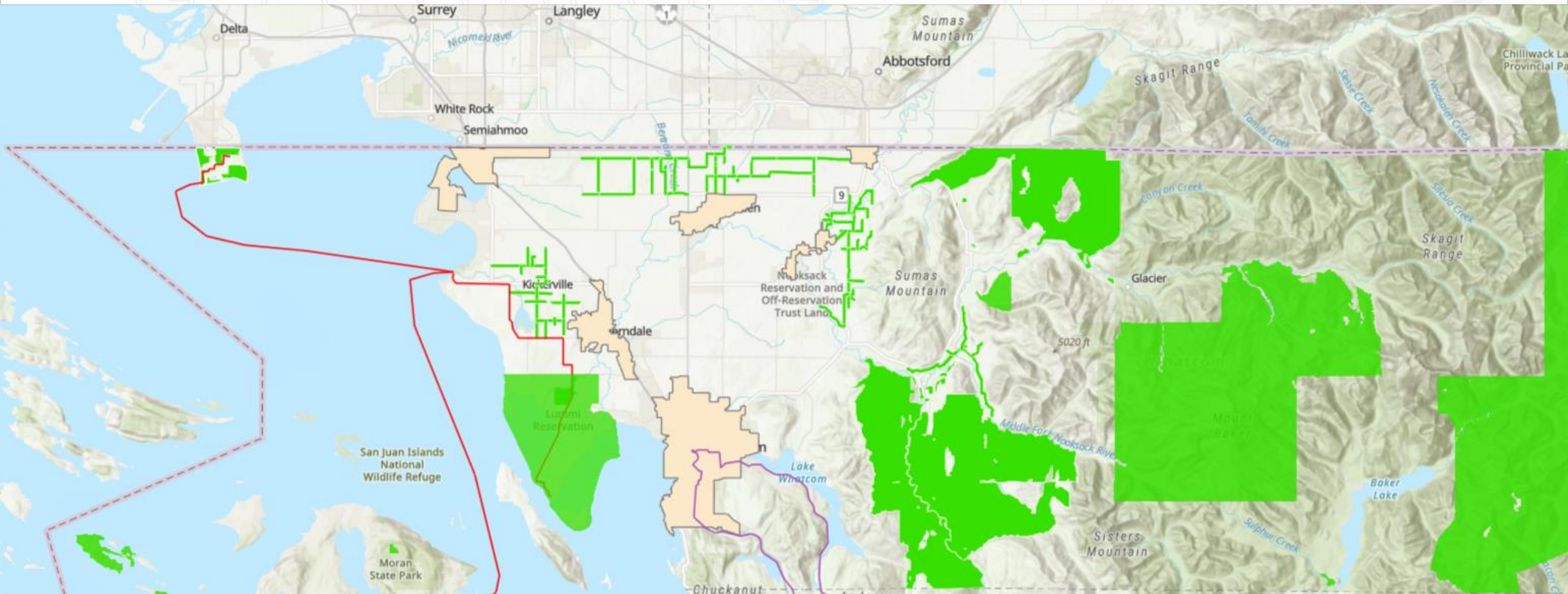WHATCOM
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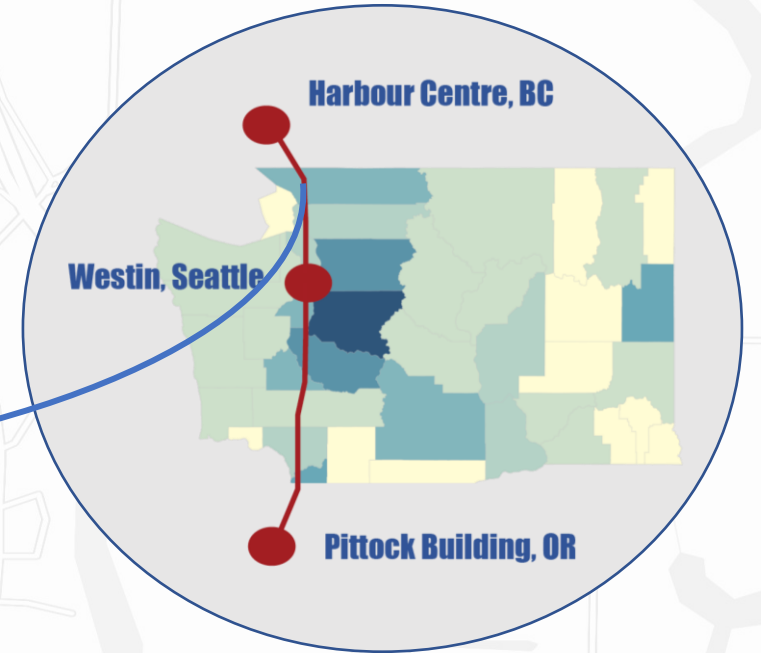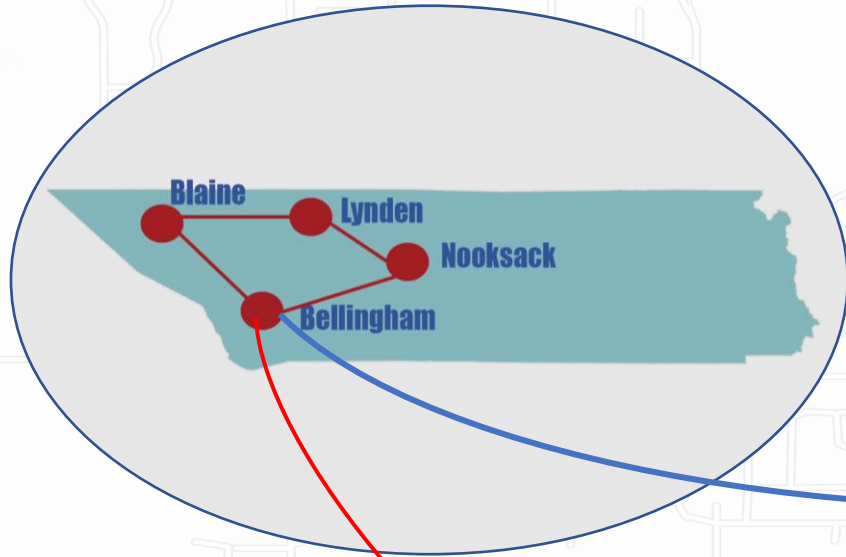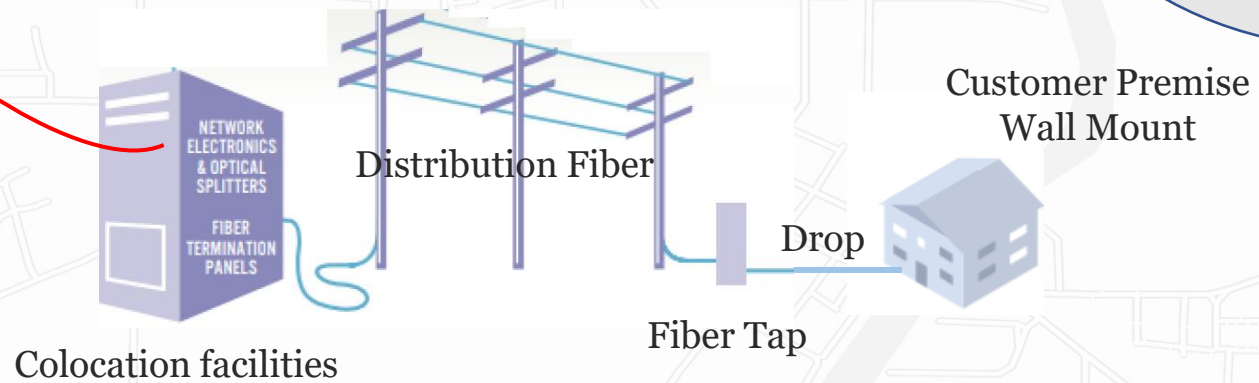
Federal/State/Local Funded Project Areas

Link to Commissioner Map tool: Click HERE

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Federal/State/Local Funded Project Areas

Awardee	Source of Funding	Project	Secured Funding	Locations
Port of Bellingham	CERB/County EDI/Port	East Nooksack/Mosquito Lake	$2,032,781	729
Port of Bellingham	CERB/County EDI	North Lynden	$3,000,000	678
Port of Bellingham	WSBO/County EDI	North Ferndale	$5,000,000	456
Whatcom PUD	WSBO/County EDI/State	Point Roberts	$3,718,250	1,274
Whidbey Tel	USDA ReConnect	Point Roberts	$596,000	144
Whidbey Tel	USDA Connect America	Point Roberts	$1,000,000	358
Whidbey Tel	Bipartisan Infrastructure Law – Middle Mile	Middle Mile Project	$11,782,208.20	N/A
Ziply	Rural Digital Opportunity Fund (RDOF) Program	Census blocks in Whatcom County	$4,411,290	1,134
Viasat	ACAM Round II	Census block groups (CBG)'s in Whatcom County	$25,189.26	40
Lummi Nation	Tribal Broadband Connectivity Program	Lummi Nation	$16,000,000	2,489
		TOTAL	$47,565,718	7,302

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Point Roberts Project

2024

Capital Budget

Project	Budget	Grant	Loan	Source
Point Roberts FTTx	$3,718,250	$3,718,250	$0	WSBO- $3,150,000 Whatcom County - $350,000 State Capital Allocation - $218,250
TOTAL	**$3,718,250**			

Operating Revenue
(Cash flow)

OPERATING REVENUES	
Dark Fiber Leases	0
Public Utility District #1 Contribution	$190,438
TOTAL REVENUES	$190,438

Operating Expenses

OPERATING EXPENSES	
Pole Attachment fees	$5,625
Salaries & Benefits	$172,891
Legal	$11,422
Memberships	$500
TOTAL OPERATING EXPENSES	$190,438

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10 – Year Cash Flow

CASH FLOW FORECAST

Starting Cash Balance	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
$	-	$ -	$ 122,456	$ 122,457	$ 159,097	$ 189,560	$ 213,661	$ 231,210	$ 242,012	$ 245,865

OPERATING REVENUES

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contract Services	0	0	0	0	0	0	0	0	0	0
Dark Fiber Leases	0	122,400	183,360	244,560	244,560	244,560	244,560	244,560	244,560	244,560
Port of Bellingham Operating Contribution	0									
Whatcom PUD Operating Contribution	190,438	196,151	18,561							
TOTAL REVENUES	190,438	318,551	201,921	244,560	244,560	244,560	244,560	244,560	244,560	244,560

OPERATING EXPENSES

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Strand Mapping/Cut sheet Service Fees	0	0	0	0	0	0	0	0	0	0
Pole Attachment Fees	5,625	5,737.50	5,852.25	5,969.30	6,088.68	6,210.45	6,334.66	6,461.36	6,590.58	6,722.40
NoaNet NOC Services @ Hut	0	0.00	0	0	0	0	0	0	0	0
Salaries & Benefits	172,891	178,078	183,420	188,923	194,590	200,428	206,441	212,634	219,013	225,584
Operating Supplies	0	0	0	0	0	0	0	0	0	0
Outside Services	0									
Communications	0	0	0	0	0	0	0	0	0	0
Travel including mileage	0	0	0	0	0	0	0	0	0	0
Insurance	0	0	0	0	0	0	0	0	0	0
Utility Expense	0	0	0	0	0	0	0	0	0	0
Memberships	500	515	530	546	563	580	597	615	633	652
Community Outreach	0	0	0	0	0	0	0	0	0	0
Legal	11,422	11,765	12,118	12,481	12,856	13,241	13,638	14,048	14,469	14,903
TOTAL OPERATING EXPENSES	190,438	196,095	201,920	207,919	214,097	220,459	227,011	233,758	240,706	247,861
NET OPERATING CASH FLOWS	0	122,456	1	36,641	30,463	24,101	17,549	10,802	3,854	(3,301)

DEBT SERVICE

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
CERB Debt Service	0	0	0	0	0	0	0	0	0	0
TOTAL DEBT SERVICE	0	0	0	0	0	0	0	0	0	0
ENDING CASH BALANCE	0	122,456	122,457	159,097	189,560	213,661	231,210	242,012	245,865	242,564

Assumptions:

1) Revenue growth (40% take rate in first year of funded project areas, 60% year two and 80% year 3) assumes additional strands leased per month at $20 per strand. Caps at 80% market penetration. Early years require capital contribution, which will be suspended when PUD generates sufficient net revenue.

2) Revenue assumptions are based on conservative build-outs of grant funded project areas.

3) PUD to make operating contribution for Year 1 and 2 to balance net cash flow.

4) Operating expenses include 100% OF Broadband Manager's salary and benefits plus legal and memberships.

5) Expense growth is @ 3% per year except where otherwise determined by contract.

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Customer Connection Process

Internet Service Provider(s)

Master Service Agreement

MSA

⬇

Service Order Summary

SOS

Quote Request

1 **Provider Email**
Provider emails request quote for dark fiber lease

Provide A and Z location (address or GPS coordinates and business name)

2 **Petrichor Response**
Petrichor provides quote for dark fiber lease NRC/MRC

(quotes are good for 12 months)

Provider Confirms

3 **Service Order**
Petrichor updates service order summary

Petrichor starts design process

4 Construction
Design, permitting, construction and splicing to Z location (8-12 weeks)

5 Fiber Assignment
Petrichor provides fiber assignment to provider and adds turn-up date to SOS

Source: Feasibility Study

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Plan of Operations

Role	Resource Plan
Business Development and Network Planning	PUD management staff
Outside Plant Design	PUD or qualified contractor
Network Construction	Public works bidding process.
Installation/termination of fiber at premises	Future contract with qualified contractor
Non-recurring charge estimates	PUD
Maintenance and Repair	Trained staff technician and/or one or more on-call contracts with qualified contractor
Emergency Restoration Services	PUD or qualified contractor
Locates	Future contract with qualified contractor
Network Operating Center	Future contract with NoaNet/WhidbeyTel
Network mapping and splice cut sheet management	Future contract with qualified contractor, administered by PUD
Customer Billing	PUD

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NEXT STEPS

1. Map the broadband environment of the project area(s) to capture broadband accessibility, affordability, and reliability.

2. Identify areas which are underserved

3. Develop network plans to meet the gaps in service found

4. Create a business case analysis of deploying the network designed

5. Develop a plan for digital inclusion efforts, supporting public safety, and educational services.

6. Meet all other requirements for BEAD

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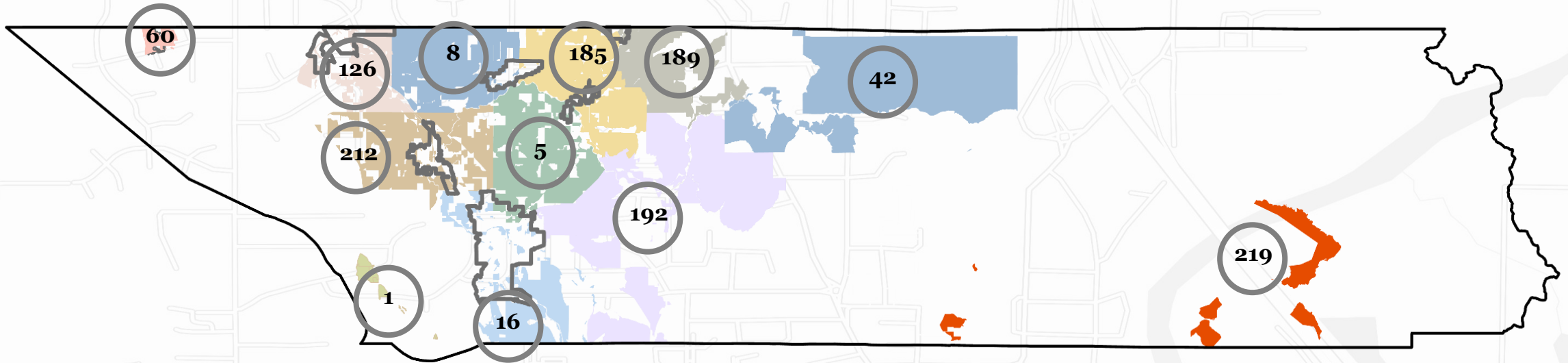# NEXT STEPS

MODELS FOR COMPARISON

- Publicly owned and open access wholesale dark fiber network model

- Publicly owned fiber, wireless or hybrid network model

ASSUMPTIONS FOR MODELING

- No debt financing

- Construction costs for infrastructure in each model should prioritize fiber in high cost areas.

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NEXT STEPS
WSBO DRAFT BEAD Project Areas

DRAFT PUD Project Areas: 60, 1, 16, 5, 189, 42, 219
Roughly 4,346 underserved and unserved locations

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Questions