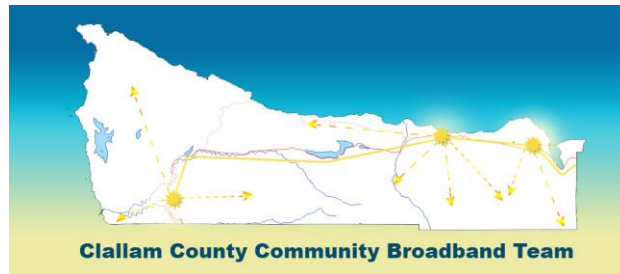




Philadelphia Office: 73 Chestnut Road, Suite 203, Paoli, PA 19301 P/610-889-7470
New York Office: 404-408 Main Street, Suite 501, Boonton, NJ 07005 P/973-794-3171
St. Paul Office: 1597 Race Street, St. Paul, MN 55102 P/651-340-5300
www.cbgcommunications.com

Clallam County, Washington Broadband Feasibility Study Report Exhibits

Submitted by:



and

CBG Communications, Inc.
Thomas G. Robinson, President & CEO
Dick Nielsen, Senior Engineer
Krystene Rivers, Senior Research Associate

and

Telecommunications Research Corporation
Constance Ledoux Book, Ph. D.

and

GeoDecisions
Brian Rudolph, GISP, Sr. Project Manager

Prepared: April 30, 2021

Table of Contents

EXHIBIT A - Vision Statement and Goals.....	1
EXHIBIT B – Initial Provider Assessment.....	3
EXHIBIT C – Anchor Institution Facility List.....	5
EXHIBIT D – Broadband Feasibility Study Roadmap.....	9
EXHIBIT E – Forks-Western Clallam County Community Broadband Meeting Invitation	13
EXHIBIT F – Sequim Community Broadband Meeting PowerPoint Discussion Guide	15
EXHIBIT G – Community Broadband Survey Results.....	27
EXHIBIT H – Broadband and Internet Infrastructure and Coverage Maps	56
EXHIBIT I – Broadband Gap Maps	64
EXHIBIT J – Broadband Authority Pro-Forma.....	68
EXHIBIT K – Middle Mile Build Scenario.....	70
EXHIBIT L – Wave FTTP Expansion Scenario.....	73
EXHIBIT M – Public-Private FTTP Build Scenario.....	77
EXHIBIT N – List of Possible Grant Opportunities.....	81
EXHIBIT O - Bibliography	84
EXHIBIT P - Glossary	87

EXHIBIT A - Vision Statement and Goals

EXHIBIT A - Vision Statement and Goals

Vision Statement

The Clallam County Broadband Team will build on local and regional broadband expansion efforts to ensure that all residents, businesses, schools, libraries, medical facilities, governments, non-profits, and tribal partners have access to affordable, high-capacity broadband infrastructure and services.

Goals of the Clallam County Broadband Team

1 – Work creatively, innovatively and collaboratively with existing and potential broadband providers to develop multiple funding sources, explore new technologies and leverage existing technologies and infrastructure to expand broadband infrastructure, capacity and services in a manner that delivers affordable access, increases and encourages adoption and provides a reasonable return on investment.

2 – Promote digital inclusion within the residential community by ensuring that all residents have the affordable access, tools and skills needed to become fully connected to and engaged with the Clallam community and the world at large, by taking full advantage of broadband services and the internet.

3 – Promote economic development and opportunity by ensuring that all businesses have the access, tools and skills needed to take full advantage of broadband services and the internet.

4 – Promote public health and public safety by ensuring access to broadband services needed by the sheriff, police, fire districts, hospitals, medical and emergency management personnel throughout the County to protect the health, safety and welfare of all the County's constituencies.

5 – Enhance and expand educational opportunities as needed through provision of uniform, high-capacity services to all pre-K-12 and higher education institutions, as well as necessary telelearning services for students at home.

6 – Ensure that governments have high capacity, affordable broadband service for the provision of services electronically to residents, from both within office environments and remotely.

7 – Build an environment of trust between all the County's constituencies as it relates to the development, enhancement, expansion and utilization of broadband services.

8 – Promote a resilient broadband network throughout the County that can continue to be available in the face of natural and manmade disasters, emergencies and other catastrophic scenarios, so that all constituencies in the County can continue to share information and work collaboratively to affect a positive outcome.

EXHIBIT B – Initial Provider Assessment

EXHIBIT B – Initial Provider Assessment

Provider	Technology	Providers' Advertised Speeds				
Wave Broadband	Cable Modem	100/5 Mbps	250/10 Mbps	940/10 Mbps		
CenturyLink	DSL	10 Mbps/50 Kbps	40/3 Mbps			
CresComm	Wireless	12/1 Mbps	20/2 Mbps	25/3 Mbps	25/3 Mbps	
OlyPen	Cable Modem (Wave)	10/1 Mbps	100/5 Mbps	250/10 Mbps	1 Gbps/10Mbps	
	DSL (CenturyLink)	256/256 Kbps	1.5 Mbps/896 Kbps			
	Wireless	Unkown				
Nikola	Wireless	6/2 Mbps	10/3.3 Mbps	15/5 Mbps	20/6.5 Mbps	25/8 Mbps
	60 GHz (limited areas)	50/50 Mbps	100/100 Mbps			
	Commercial Fiber	100/100 Mbps				
North Olympic Peninsula Data Centers	DSL (CenturyLink)	6 Mbps/500 Kbps	15 Mbps/750 Kbps	30/1.5 Mbps	80/10 Mbps	
	FTTP (CenturyLink)	100/100 Mbps	500/500 Mbps	1/1 Gbps		
Jamestown Networks		Quotes given for Institutional and business uses				
NoaNet		Quotes given for Institutional uses				

EXHIBIT C – Anchor Institution Facility List

EXHIBIT C – Anchor Institution Facility List

Known Anchor Institutions, Providers and Speeds					
Facility Name	Facility Address	Provider	Down Speed	Up Speed	Technology
Beaver Sheriff Office	196283 Highway 101, Forks	CenturyLink	1.2 Mbps	5 Mbps	T1, DSL
CCSO Evidence	703 E Front St, Port Angeles	Wave	100 Mbps	100 Mbps	Fiber
Central Office	13193 Hwy 112, Sekiu	CenturyLink K-20	1 Gbps	1 Gbps	Fiber
Clallam Bay Branch	16990 Highway 112, Clallam Bay	CenturyLink	100 Mbps	100 Mbps	Fiber
Clallam Bay Sheriff Office	663 Frontier Street, Clallam Bay	CenturyLink	<1 Mbps	<1 Mbps	Dry Pair of wires
Clallam County Courthouse	223 East Fourth St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Crescent School District	50350 Highway 112, Joyce	CenturyLink K-20	500 Mbps	500 Mbps	Fiber
Fairgrounds	1608 W 16th St, Port Angeles	Wave	50 Mbps	50 Mbps	Provisioned Ethernet Link
Fire District 3	323 N 5th Ave, Sequim	Unsure of connection speeds and infrastructure			
Forks Branch Library	171 Forks Avenue South, Forks	Wave	30 Mbps	30 Mbps	Fiber
Forks Community Hospital	530 Bogachiel Way, Forks	OlyPen/PUD	100 Mbps	100 Mbps	Fiber
Forks District Court (II)	502 E Division Street, Forks	Wave	100 Mbps	100 Mbps	Provisioned Ethernet Link
Forks HHS	140 C ST, Forks		1.2 Mbps	1.2 Mbps	T1
Forks Road Shop	51 Bedrock Road, Beaver	CenturyLink	N/A	N/A	DSL
Greywolf Elementary School	171 Carlsborg Rd, Sequim	CenturyLink	2 Gbps	2 Gbps	Fiber
Guy Cole Event Center	202 N Blake Ave, Sequim	Olypen	100 Mbps	100 Mbps	Fiber
Helen Haller Elementary	350 West Fir St, Sequim	CenturyLink	2 Gbps	2 Gbps	Fiber
Jamestown Family Health Clinic	808 N 5th Ave, Sequim	OlyPen/PUD	Unsure of connection speeds		Fiber
John Wayne Marina	2577 W Sequim Bay Rd, Sequim	Olypen	30 Mbps	10 Mbps	DSL
Juvenile and Family Services	1912 W 18th St, Port Angeles	Wave	1 Gbps	1 Gbps	Leased Dark Fiber
K-12 Clallam Bay School	16933 Hwy 112, Clallam Bay	CenturyLink K-20	50 Mbps	50 Mbps	Fiber
LaPush PD	1472 Ocean Dr, La Push	Unsure of connection speeds and infrastructure			

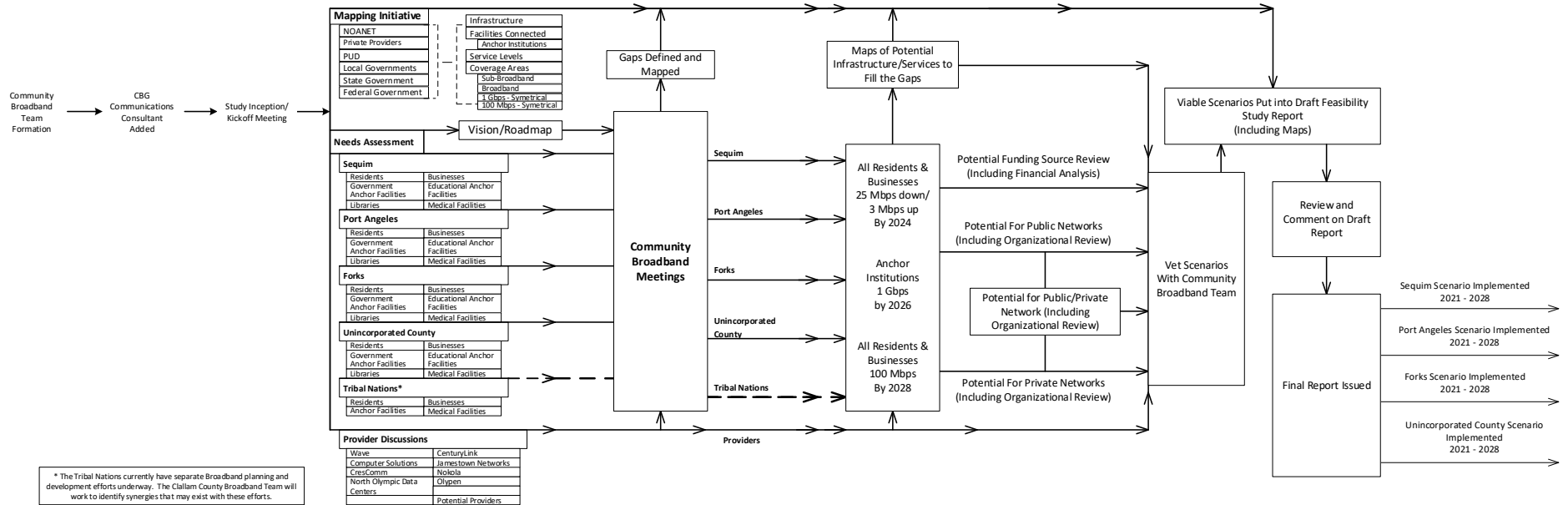
Known Anchor Institutions, Providers and Speeds					
Facility Name	Facility Address	Provider	Down Speed	Up Speed	Technology
Lower Elwha PD	341 Spokwes Dr, Port Angeles	Unsure of connection speeds and infrastructure			
Neah Bay	3560 Deer St, Neah Bay	OlyPen	100 Mbps	100 Mbps	Fiber
North Olympic Healthcare Network	240 W Front St, Port Angeles	Wave	100 Mbps	100 Mbps	Fiber
Olympic Peninsula Academy	400 North 2nd Ave, Sequim	CenturyLink	2 Gbps	2 Gbps	Fiber
OMC (Olympic Medical Center)	939 Caroline Street, Port Angeles	Century Link	400 Mbps	200 Mbps	Fiber
OPNET	110 S Penn St, Port Angeles	Wave	50 Mbps	50 Mbps	Provisioned Ethernet Link
Pencom	321 E 5th St, Port Angeles	County network	Unsure of connection speeds		Fiber
Peninsula College (Forks/West End)	481 South Forks Avenue, Forks	K-20 Fiber to Main Campus	30 Mbps	30 Mbps	Fiber
Peninsula College (Main Campus)	1502 E Lauridsen Blvd, Port Angeles	CenturyLink K-20	1 Gbps	1 Gbps	Fiber
Port Angeles 3rd Street HHS	111 E 3rd St, Port Angeles	Wave	100 Mbps	100 Mbps	Provisioned Ethernet Link
Port Administration Office	338 W First St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Port Angeles Boat Haven	202 N Cedar St, Port Angeles	OlyPen	35 Mbps	10 Mbps	DSL
Port Airport Industrial Park	South O St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Port Angeles City Hall	321 E 5th St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Port Angeles Fire Department	102 E 5th St, Port Angeles	Unsure of connection speeds and infrastructure			
Port Angeles Main Library	2210 South Peabody Street, Port Angeles	K-20	500 Mbps	500 Mbps	Fiber
Port Angeles Road Shop	1033 W Lauridsen Blvd, Port Angeles	Wave	100 Mbps	100 Mbps	Provisioned Ethernet Link
Port Composite Manufacturing Campus	2138 West 18 th St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Port Marine Terminal	202 N Cedar St, Port Angeles	Wave	1 Gbps	1 Gbps	Fiber
Sequim Branch Library	630 North Sequim Ave, Sequim	Wave	1 Gbps	1 Gbps	Fiber
Sequim City Hall	152 W Cedar St, Sequim	Olypen	100 Mbps	100 Mbps	Fiber
Sequim District Office	503 North Sequim Ave, Sequim	CenturyLink	1 Gb	1 GB	Fiber
Sequim High School	601 North Sequim Ave, Sequim	CenturyLink	2 Gbps	2 Gbps	Fiber
Sequim James Center for the Performing Arts	202 N Blake Ave, Sequim	Olypen	1.5 Mbps	1.5 Mbps	DSL
Sequim Middle School	301 West Hendrickson, Sequim	CenturyLink	2 Gbps	2 Gbps	Fiber

Known Anchor Institutions, Providers and Speeds					
Facility Name	Facility Address	Provider	Down Speed	Up Speed	Technology
Sequim Middle School	301 W Hendrickson Rd, Sequim	Olypen	25 Mbps	25 Mbps	Fiber
Port Williams Pump House	381 Port Williams Rd, Sequim	Olypen	3 Mbps	1 Mbps	DSL
Sequim Re-use Center	202 N Blake Ave, Sequim	Olypen	1.5 Mbps	1.5 Mbps	DSL
Sequim Road Shop	1453 W Washington, Sequim	Olypen/Wave	N/A	N/A	Cable
Sequim Transit Center	190 W Cedar St, Sequim	Olypen	100 Mbps	100 Mbps	Fiber
Sequim Wastewater Reclamation Facility	247 Schmuck Rd, Sequim	Nikola	20 Mbps	~25% of download	Wireless
Sequim Well	124 W Silberhorn Rd, Sequim	Olypen	1.5 Mbps	1.5 Mbps	DSL
Sequim Well	551 Reservoir Rd, Sequim	Olypen	1.5 Mbps	1.5 Mbps	DSL
Sequim Well	702 Port Williams Rd, Sequim	Olypen	5 Mbps	1 Mbps	DSL
William R. Fairchild International Airport	1402 Airport Rd, Port Angeles	Wave	50 Mbps	50 Mbps	Fiber

EXHIBIT D – Broadband Feasibility Study Roadmap

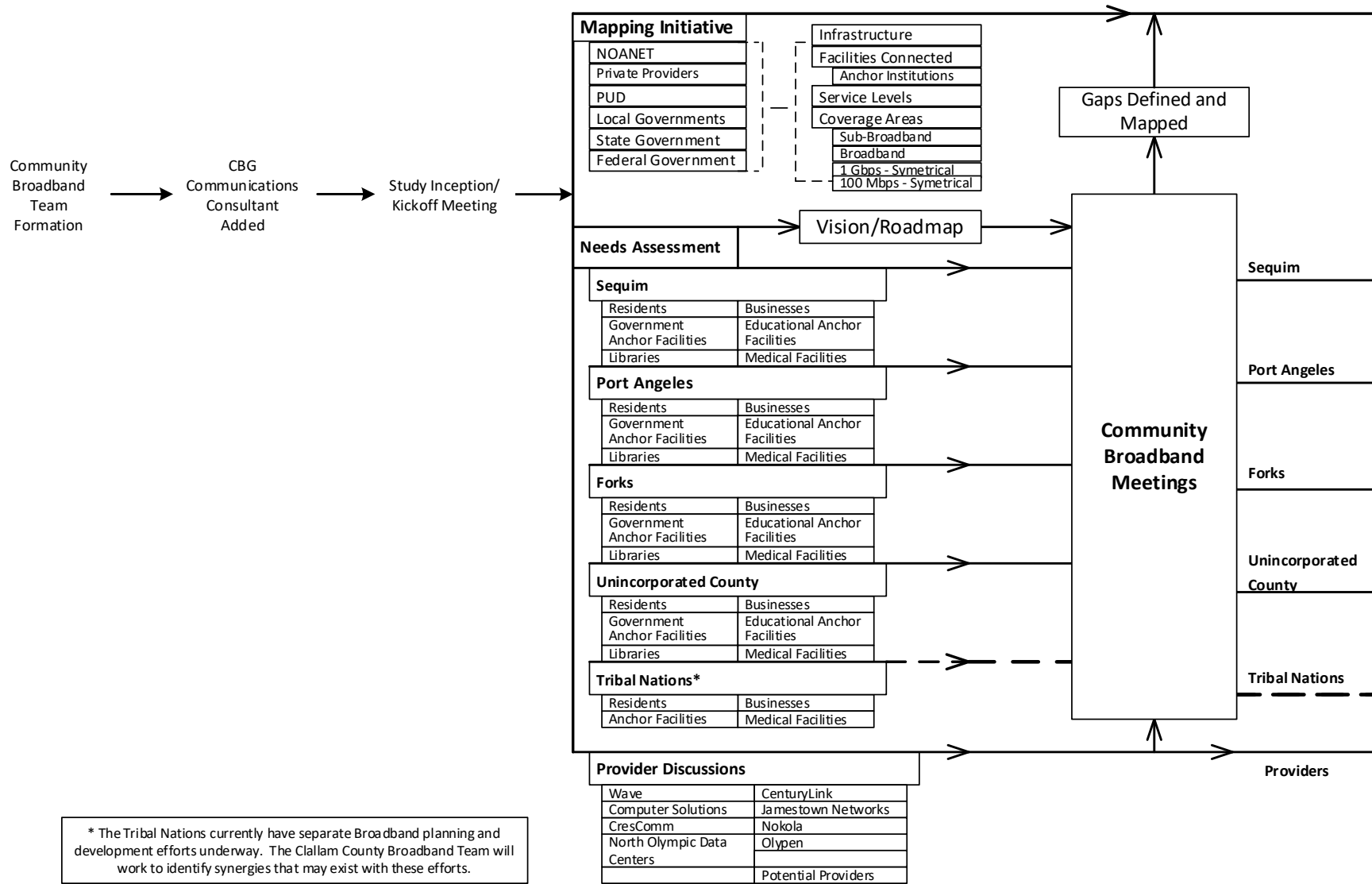
EXHIBIT D – Broadband Feasibility Study Roadmap

Clallam County Broadband Feasibility Study
Roadmap



Clallam County Broadband Feasibility Study

Roadmap



* The Tribal Nations currently have separate Broadband planning and development efforts underway. The Clallam County Broadband Team will work to identify synergies that may exist with these efforts.

Clallam County Broadband Feasibility Study

Roadmap

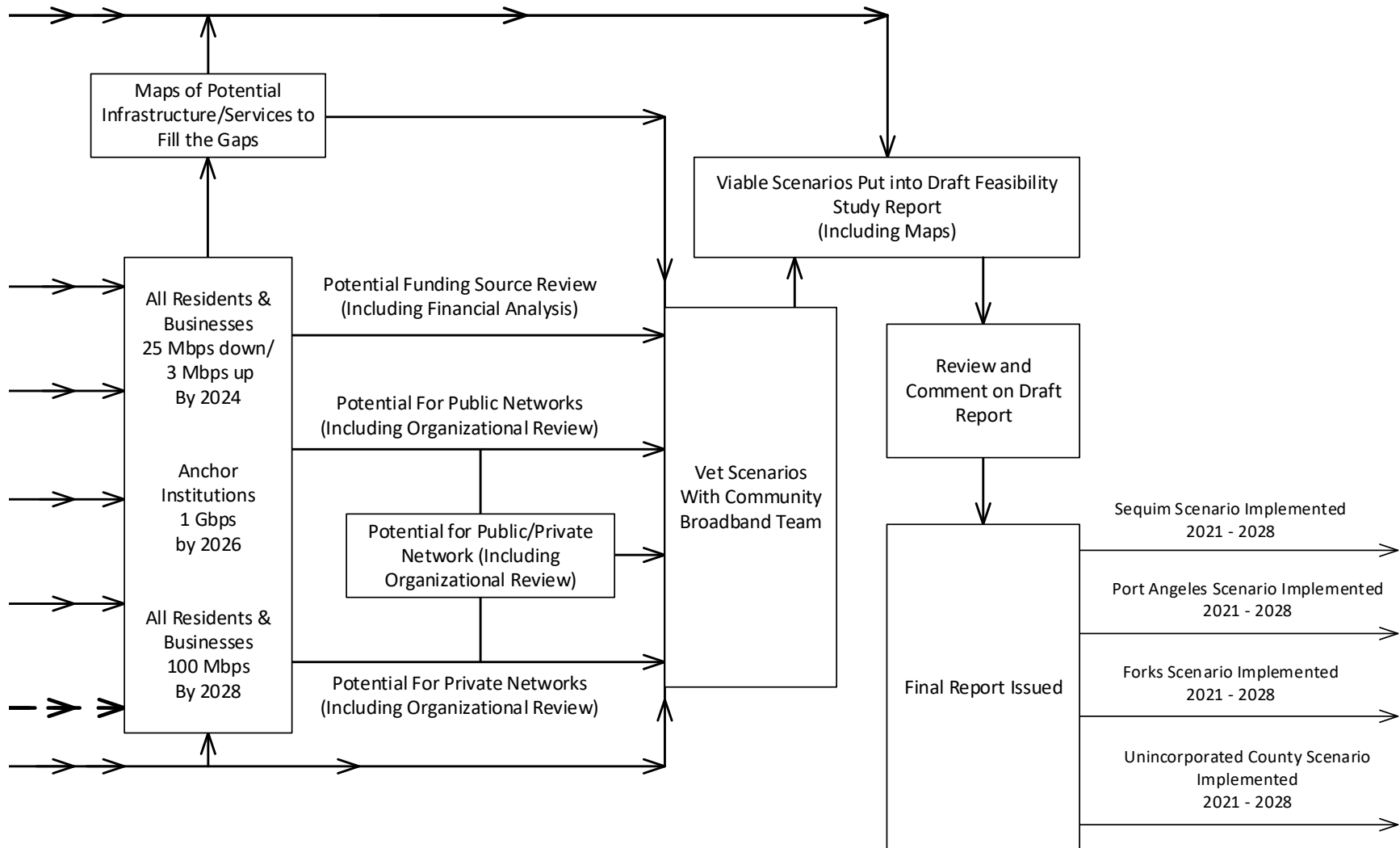


EXHIBIT E – Forks-Western Clallam County Community Broadband Meeting Invitation

EXHIBIT E – Forks-Western Clallam County Community Broadband Meeting Invitation



BROADBAND COMMUNICATIONS NEEDS, INTERESTS, PROBLEMS AND POTENTIAL SOLUTIONS TO BE DISCUSSED AT A COMMUNITY BROADBAND MEETING IN FORKS

We need your participation!

Broadband communications services for Forks and western Clallam County (West End) are not uniformly available and have created challenges for residents, businesses, organizations and institutions. These challenges have led to many questions for our community. For example, can changes in the broadband communications marketplace provide affordable new, expanded, and improved services for Forks and West End residents, businesses, and organizations? What are the current and future broadband needs of the Forks and the West End? Could Forks and the County help spur faster and more wide-ranging development of such services, and what should their level of involvement be? How might broadband providers help meet these needs?

Forks and the Clallam County Community Broadband Team (Team) need your help in answering these questions. We are currently evaluating broadband communications needs and interest among residents, businesses, non-profits, institutions, and broadband providers within the County. As part of this evaluation, the Team has scheduled a virtual meeting for all interested parties. You can be a part of shaping the future of broadband services in your community by participating in the following:

Community Broadband Meeting
October 21, 2020
6:30 p.m. – 8:30 p.m.
Virtual Attendance via Zoom/Facebook Live

Experts in the broadband and telecommunications field will be on hand to discuss the future of broadband service in Forks and the West End, and how it could affect you and our community. Meeting facilitators will answer questions and take comments from participants. The discussion will cover a wide range of topics such as **current and future service needs** (service expansion, higher speed data communications, more portable and mobile communications, provision of residential and business services and applications, etc.) and **infrastructure availability concerns** (expansion of fiber optics and wireless systems, availability of new networks, extension of existing networks, network interconnections, etc.).

As a participant in the meeting, you will help the Team greatly in determining where it should focus its efforts to help meet your needs.

For more information, and to register for the Zoom meeting, please contact Rod Fleck at (360) 374-5412 or by e-mail to rodf@forkswashington.org. We look forward to seeing you on Zoom/Facebook Live!

EXHIBIT F – Sequim Community Broadband Meeting PowerPoint Discussion Guide

EXHIBIT F – Sequim Community Broadband Meeting PowerPoint Discussion Guide

**Clallam County, Washington
Broadband Feasibility Study
City of Sequim Community Meeting**

CITY OF SEQUIM

Clallam County Community Broadband Team

CBG Communications

Facilitated by:
Anthony Martin, Sequim IT Program Manager
Karen Affeld, NODC, Executive Director
Tom Robinson, CBG President & CEO
Dick Nielsen, CBG Senior Engineer
Connie Book, PhD, Lead Researcher

This Meeting is Being Recorded for Study Documentation Purposes

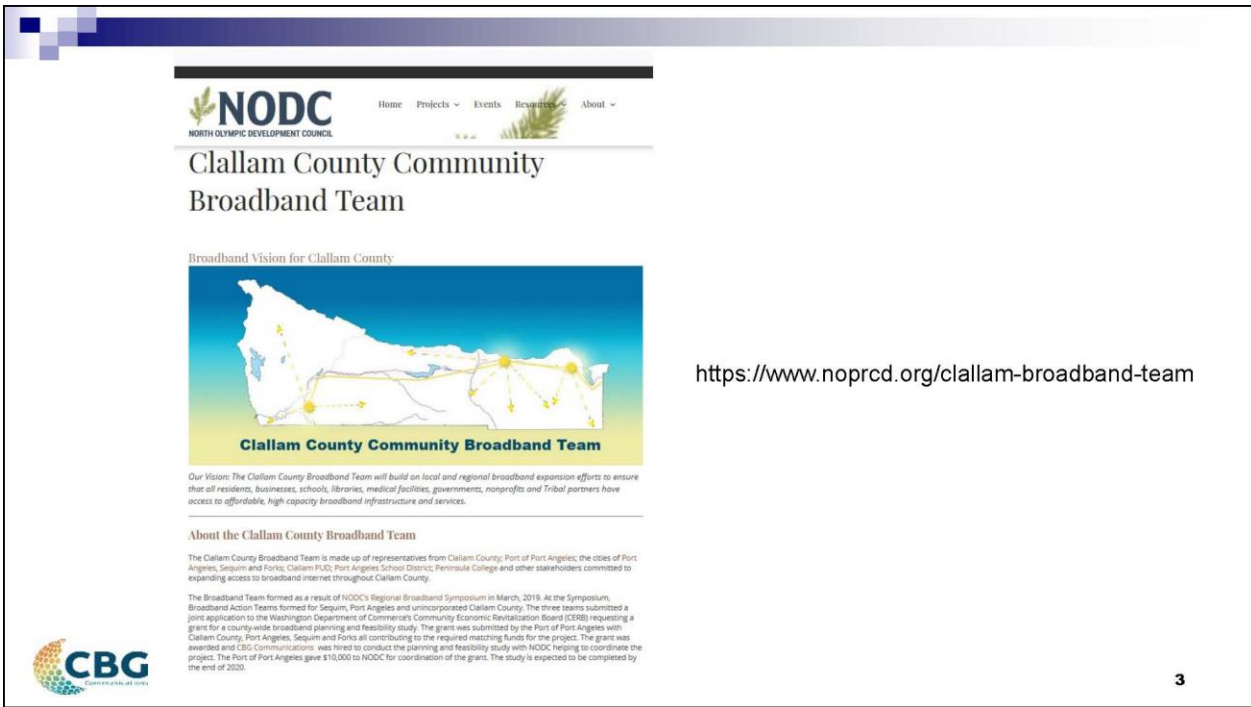
1

Introductions

- Facilitators:
 - Anthony Martin, Sequim IT Program Manager
 - Karen Affeld, NODC, Executive Director
 - Tom Robinson, CBG, Overall Project Manager
 - Dick Nielsen, CBG, Senior Engineer
 - Dr. Constance Book, Lead Researcher
- Panel of Local Stakeholders

CBG Communications

2



The screenshot shows the NODC (North Olympic Development Council) website. At the top, there is a navigation menu with links for Home, Projects, Events, Resources, and About. Below the NODC logo, the page title is "Clallam County Community Broadband Team". Underneath, there is a sub-header "Broadband Vision for Clallam County" followed by a map of Clallam County with yellow dots and lines representing broadband connections. Below the map is the text "Clallam County Community Broadband Team".


<https://www.noprco.org/clallam-broadband-team>

Our Vision: The Clallam County Broadband Team will build on local and regional broadband expansion efforts to ensure that all residents, businesses, schools, libraries, medical facilities, governments, nonprofits and Tribal partners have access to affordable, high capacity broadband infrastructure and services.

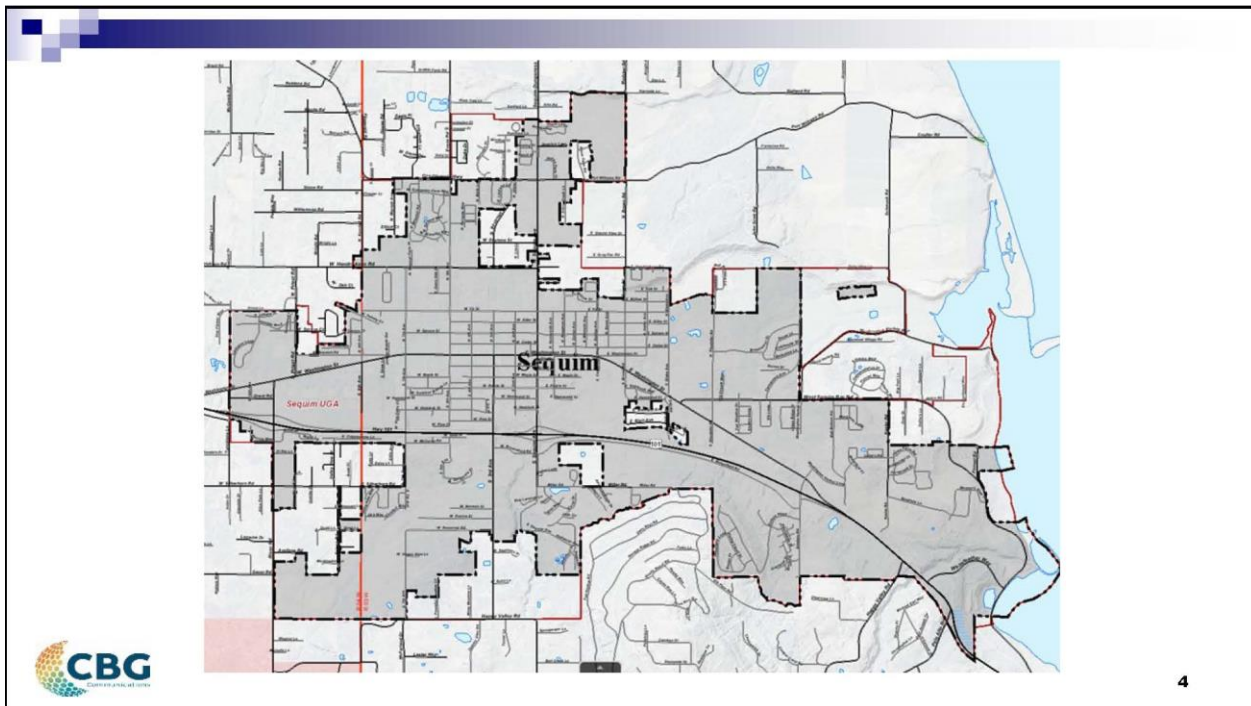
About the Clallam County Broadband Team

The Clallam County Broadband Team is made up of representatives from Clallam County; Port of Port Angeles; the cities of Port Angeles, Sequim and Forks; Clallam PUD; Port Angeles School District; Peninsula College and other stakeholders committed to expanding access to broadband internet throughout Clallam County.


The Broadband Team formed as a result of NODC's Regional Broadband Symposium in March, 2019. At the Symposium, Broadband Action Teams formed for Sequim, Port Angeles and unincorporated Clallam County. The three teams submitted a joint application to the Washington Department of Commerce's Community Economic Revitalization Board (CEBR) requesting a grant for a county-wide broadband planning and feasibility study. The grant was submitted by the Port of Port Angeles with Clallam County, Port Angeles, Sequim and Forks all contributing to the required matching funds for the project. The grant was awarded and CBG Communications, Inc. was hired to conduct the planning and feasibility study with NODC helping to coordinate the project. The Port of Port Angeles gave \$10,000 to NODC for coordination of the grant. The study is expected to be completed by the end of 2020.



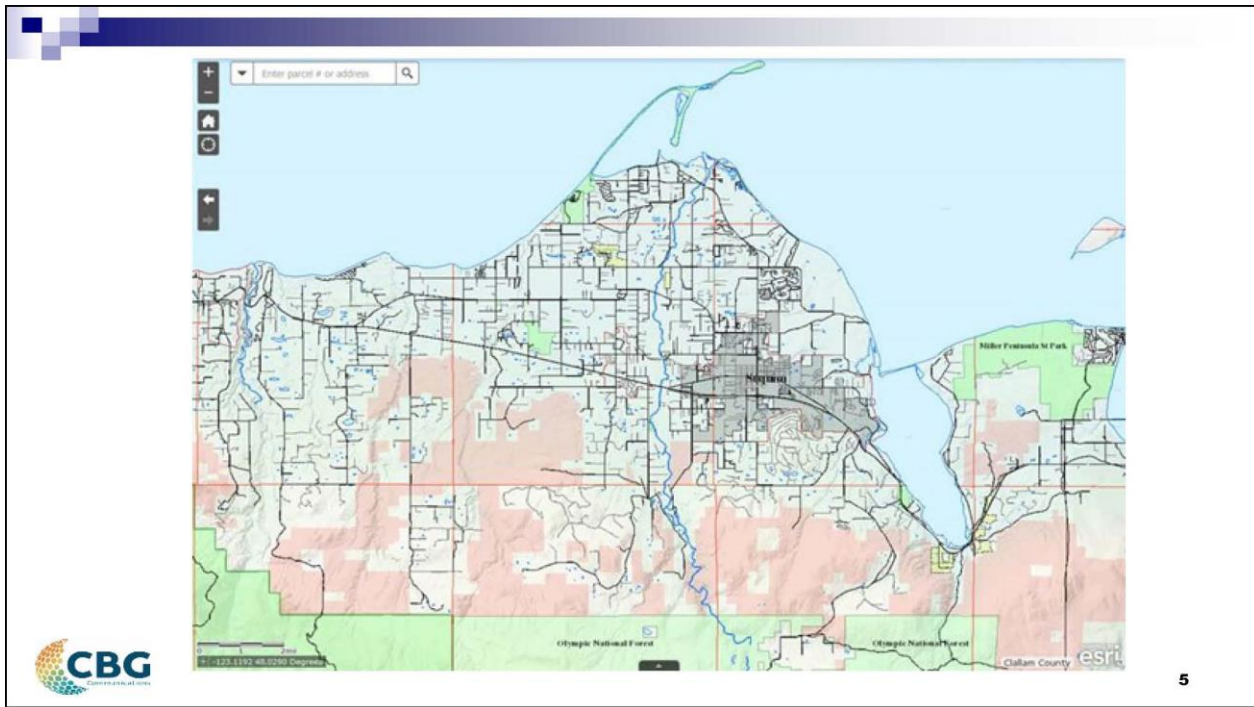
3



The map shows the town of Sequim, Washington, with a detailed street grid. The town is shaded in grey. A red line indicates the Sequim UGA (Unincorporated Growth Area) boundary. The map also shows the coastline and some water bodies.



4



CLALLAM COUNTY BROADBAND FEASIBILITY STUDY VISION STATEMENT

The Clallam County Broadband Team will build on local and regional broadband expansion efforts to ensure that all residents, businesses, schools, libraries, medical facilities, governments, nonprofits and Tribal partners have access to affordable, high capacity broadband infrastructure and services.

To achieve this vision, the Broadband Team establishes the following Goals:

1. Work creatively, innovatively and collaboratively with existing and potential broadband providers to develop multiple funding sources, explore new technologies and leverage existing technologies and infrastructure to expand broadband infrastructure, capacity and services in a manner that delivers affordable access, increases and encourages adoption and provides a reasonable return on investment.



CLALLAM COUNTY BROADBAND FEASIBILITY STUDY VISION STATEMENT – (Cont.)

2. Promote digital inclusion within the residential community by ensuring that all residents have the affordable access, tools and skills needed to become fully connected to and engaged with the Clallam community and the world at large, by taking full advantage of broadband services and the Internet.
3. Promote economic development and opportunity by ensuring that all businesses have the access, tools and skills needed to take full advantage of broadband services and the internet.
4. Promote public health and public safety by ensuring access to broadband services needed by the sheriff, police, fire districts, hospitals, medical and emergency management personnel throughout the County to protect the health, safety and welfare of all the County's constituencies.



7

CLALLAM COUNTY BROADBAND FEASIBILITY STUDY VISION STATEMENT – (Cont.)

5. Enhance and expand educational opportunities as needed through provision of uniform, high capacity services to all pre-K-12 and higher education institutions, as well as necessary telelearning services for students at home.
6. Ensure that governments have high capacity, affordable broadband service for the provision of services electronically to residents, from both within office environments and remotely.
7. Build an environment of trust between all the County's constituencies as it relates to the development, enhancement, expansion and utilization of broadband services.
8. Promote a resilient broadband network throughout the County that can continue to be available in the face of natural and manmade disasters, emergencies and other catastrophic scenarios, so that all constituencies in the County can continue to share information and work collaboratively to affect a positive outcome.

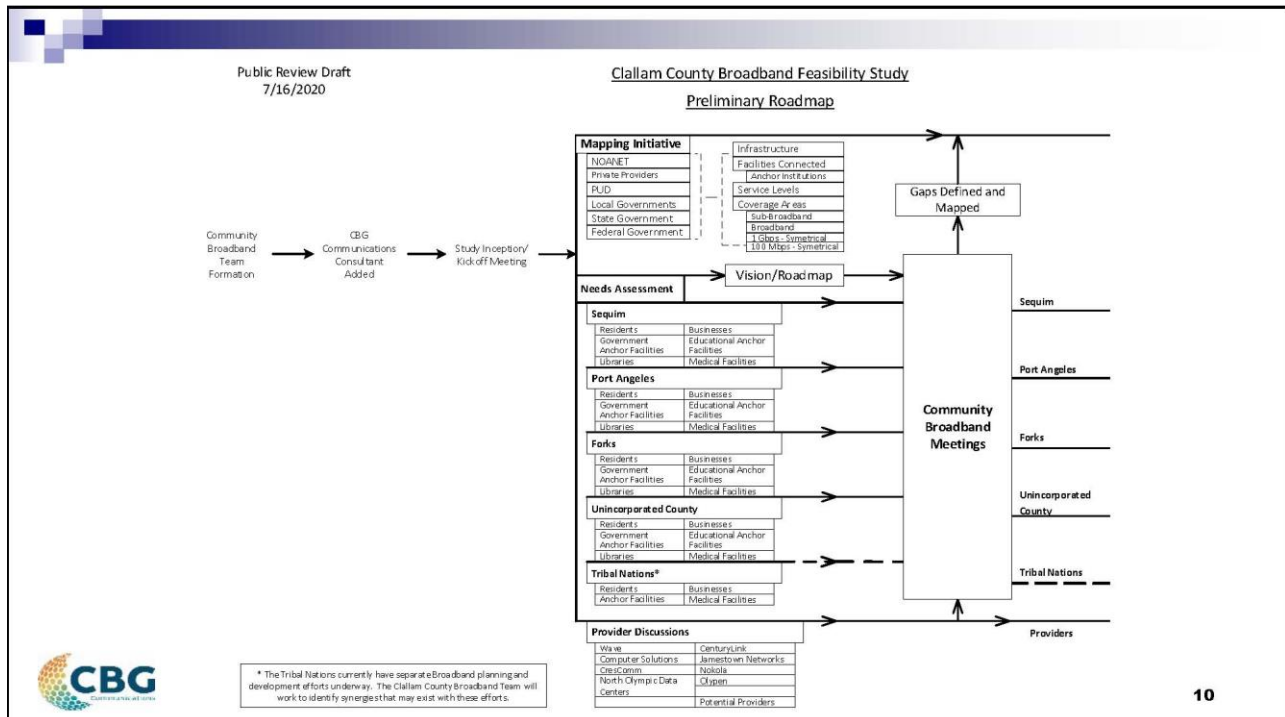


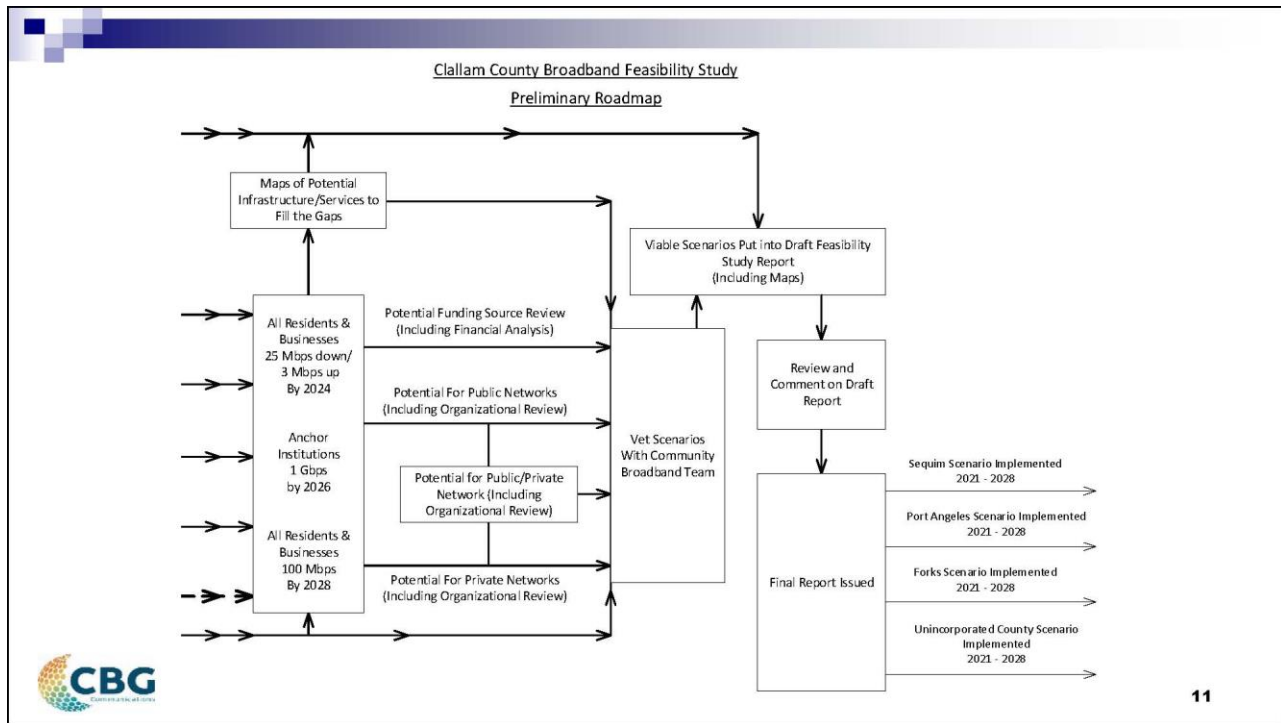
8

State Broadband Goals

State Goals

- 25 Mbps Download and 3 Mbps Upload (25/3 Mbps) Everywhere by 2024
- 1 Gbps to Every Anchor Institution by 2026
- 100/100 Mbps (Symmetrical) Everywhere by 2028

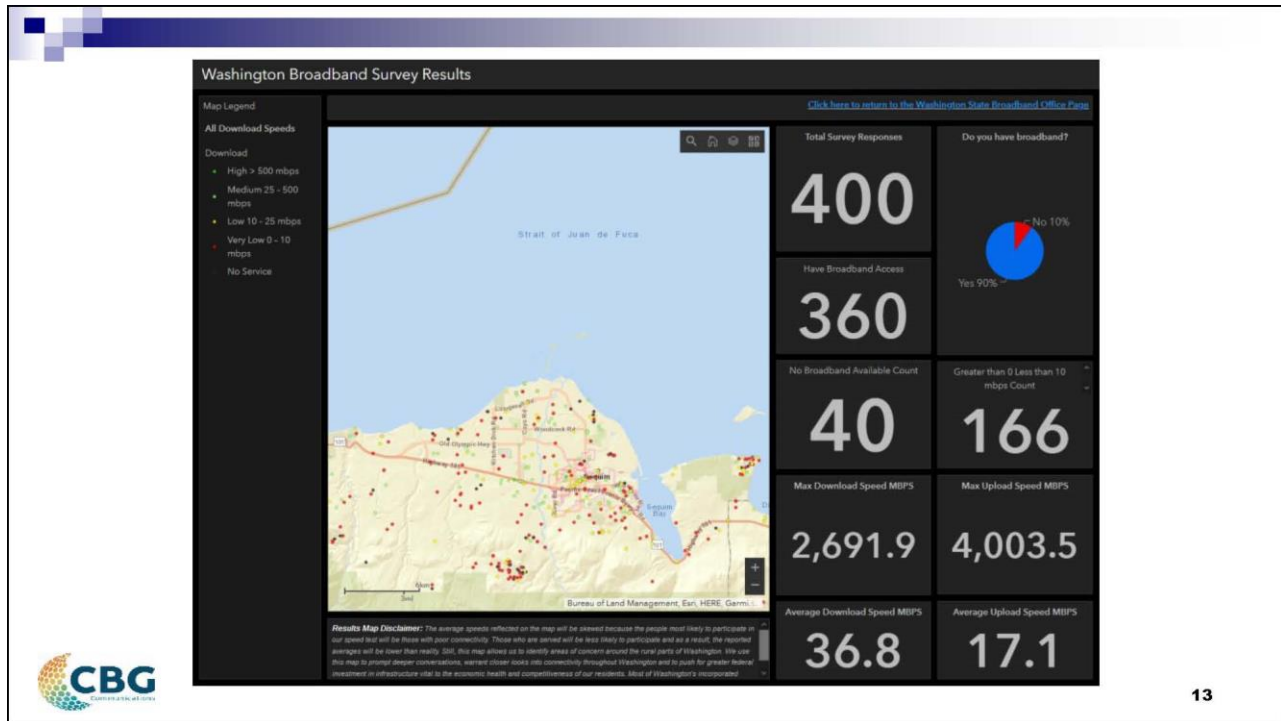




Concerning Broadband-Where Is Sequim and Clallam County?

- **City of Sequim**
 - Existing Service Levels
 - Existing Service Providers
 - Existing Technologies
- **Urban Growth Area**
 - Existing Service Levels
 - Existing Service Providers
 - Existing Technologies
- **Around Sequim (Outside UGA)**
 - Existing Service Levels
 - Existing Service Providers
 - Existing Technologies





Community Economic Revitalization Board (CERB) Questions

- Does Existing Broadband, in Sequim, the Urban Growth Area and the nearby areas of the County, meet Today's Needs?
 - Take the Speed Test
 - <http://www.broadband.wa.gov/>
- If Not, Where does it Fall Short?



Community Economic Revitalization Board (CERB) Questions – (Cont.)

- If you have Broadband, How do you Use it Now?
- Current Critical Needs - State of:
 - Telehealth/Telemedicine
 - Tele-Learning/Tele-Education
 - K-12
 - Higher Education
 - For Students
 - For Teachers



15

Community Economic Revitalization Board (CERB) Questions – (Cont.)

- Current Critical Needs - State of:
 - Telework
 - Small/Medium Business
 - Large Business
 - Institutions
 - Others?



16

Working to Get There

- **Cooperative Efforts**
 - ISPs
 - PUD
 - Tribes
 - Institutions and Large Businesses
- **Potential Technologies for Expansion**
 - Wireless – All Types
 - Wireline – All Types



17

Working to Get There

- **Making the Business Case**
 - ROI
 - Price Points for Service
 - Penetration Numbers Needed
 - Cost Recovery Period Needed



18

Working to Get There

■ Potential Funding Sources

- Private Capital
- Grants
- Loans
- Public Funds



19

Working to Get There

■ How Can We Help Each Other?

- Adoption Spurring Efforts
- Take the State's Speed Test to Provide Data
- Take the Team's Survey to Provide Data
[https://www.surveymonkey.com/r/Clallam County Community Broadband Survey](https://www.surveymonkey.com/r/Clallam_County_Community_Broadband_Survey)
- Think About Joint Efforts



20

Working to Get There

- How Can We Help Each Other?
 - Think About Phased Expansion
 - Help Vet Scenarios/Proposals Put Forward Later in the Process
 - Support the Common Goals Determined
- Next Steps



21

Thank You For Participating this
Evening and Beyond!!



22

EXHIBIT G – Community Broadband Survey Results

Exhibit G – Clallam County – Community Broadband Survey

All Survey Respondents (N=368)

1. What is your five-digit zip code?

Zip Code	Responses	Percentage
98382	148	40%
98363	103	28%
98362	96	26%
98331	13	4%
98305	3	1%
98326	2	0.5%
98381	2	0.5%
98636	1	0.3%

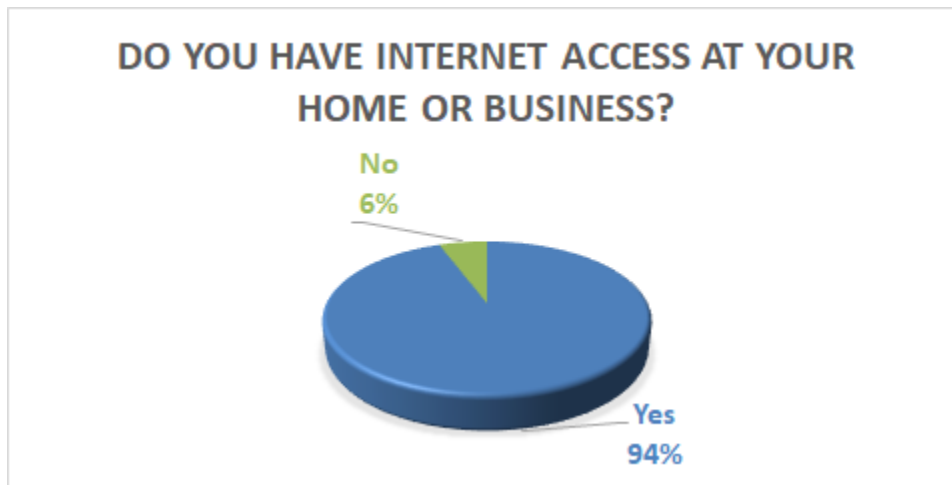
2. Are you a resident or business? (N=368)

Respondent	Responses	Percentage
Resident	347	94%
Business	14	4%
Resident & Business	7	2%

3. Do you have Internet Access at your home or business? (N=368)

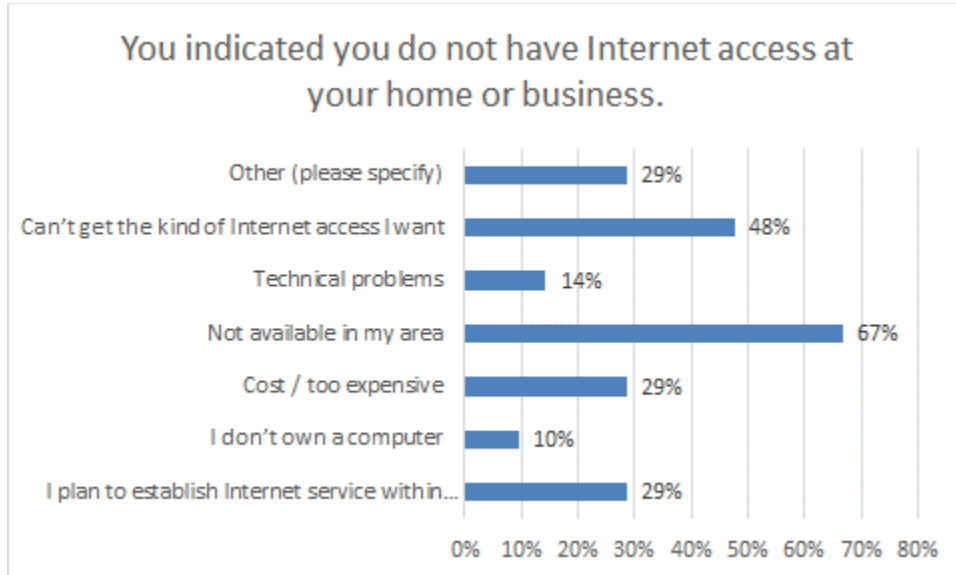
Yes 94% (N=347)

No 6% (N=21)



4. You indicated you do not have Internet Access at your home or business. Please choose all the reasons that apply?

No Internet at Home or Business (N=21)



Other (Please specify) (N=6)

- the only thing available was dial-up and I don't have a land line
- Was quoted \$10,000 to get internet from Wave broadband to get to our home in 2019
- I have the option of going satellite internet which varies day to day on speeds.
- My main complaint is there is zero broadband for my area. Only expensive satellite plans such as Hughes net that will not sufficiently meet our needs and costs too much
- Only available via mobile phone Hot Spot
- Entrepreneur just moved into the area. Need reasonable internet pricing, 100 Mbps at a minimum.

5. What Internet service providers are available to you? (Choose all that apply) (N=20)

Service Providers Available	N=20
Wave	25%
CenturyLink	25%
HughesNet	25%
Verizon Wireless	25%
AT&T Wireless	5%
Dish	5%
Don't Know	40%
Other (please specify)	10%

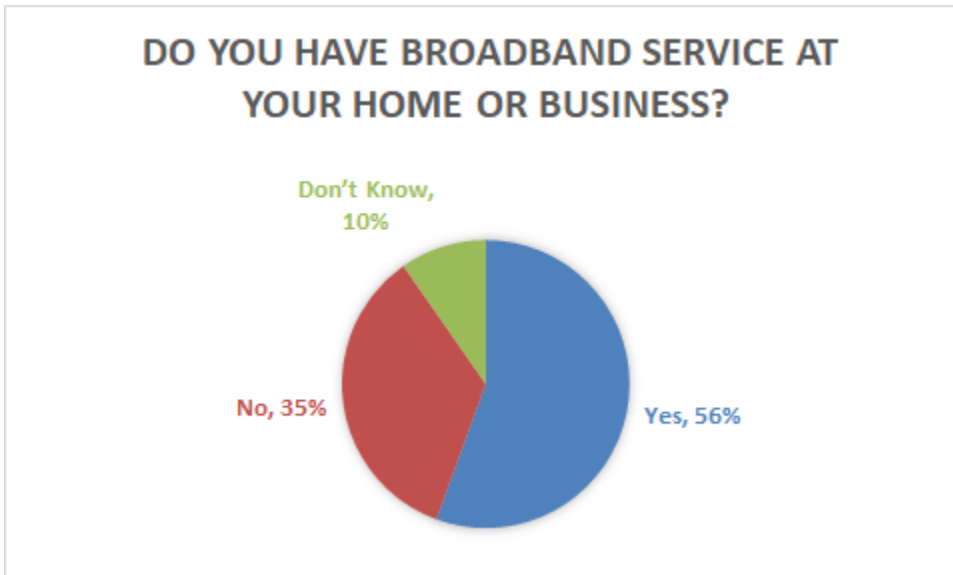
Other (N=2)

- Hotspot with Verizon our iPhone service provider
- Unable to use satellite due to Mt McDonald on the South currently nothing available there

6. Do you have broadband service at your home or business (defined as a minimum of 3 megabits per second upload / 25 megabits per second download)?

Yes 56% (N=189)
 No 35% (N=118)
 Don't Know 10% (N=33)

All Respondents with Internet (N=340)



7. You indicated that you do not have broadband service at your home or business. Please choose all the reasons that apply: (N=119)

Reasons	Percentage
Cost / too expensive	13%
Not available in my area	61%
Poor opinion of available providers	15%
My Internet service cannot provide broadband speeds	58%
The provider I want is not in my area	13%
My smartphone is all I need	2%
Other (please specify) N=19	16%

Other (N=19)

- The current provider says they have broadband, but the actual speeds are far less, if nonexistent.
- only cheap option: satellite internet, mobile internet (4g+datacaps+barely their reception)
- Speed is below what last question specified
- It said broadband was 25 megabits a second my area doesn't get that
- Download speeds can OCCASIONALLY reach 25-30 mpbs, but this is directly affected by the number of homes in our neighborhood which are trying to access the internet at a given time. Average speed is ~7mbps
- We only have satellite available in our area which is very slow and does not always work.
- I have broadband less than one megabyte per minute download. Century Link. VERY POOR. \$90 per month
- I'm 20 Mpbs not sure if my service can provide it at an added expense, but the service (with Verizon hotspot) is unreliable here
- Current CenturyLink download speed is 20 Mpbs; upload is 1.75 Mpbs
- The cable that runs into our house is outdated VERY outdated
- I have Century Link DSL. Speeds around 10 MB/s
- We get 0.5 Mbps, much worse than most third world countries.
- Don't know how to get it
- ATT wireless with new MIMO array on Hwy 101 coming on line now
- I have 10 Mb speed. It's very adequate for my needs. It does not meet your definition of Broadband.
- Broadband speeds available near Hwy 101 but drop off quickly. This per the phone techs.
- I get the highest speeds available to me by the only provider that serves my home address
- Nikola broadband currently gives us 15-20 Mbps download
- Our only option is satellite internet and it is terrible. I primarily use my Phone (Verizon service) for internet access because it's better than satellite

8. Who is your broadband and/or Internet Access provider? (N=337)

Providers	Response	Percentage
Wave	123	37%
CenturyLink	124	37%
CresComm	1	0.3%
Nikola	21	6%
OlyPen	18	5%
HughesNet	10	3%
WildBlue / Viasat	6	2%
Verizon Wireless	13	4%
AT&T Wireless	5	1%
T-Mobile/Sprint	1	0.3%
Dish	4	1%
Don't Know	1	0.3%
Other (please specify)	10	3%

Other (please specify) (N=10)

- T-Mobile (with data caps and poor reception – bout 1-2 bars)
- don't have Broadband; I do have Verizon cellphone service and a Hotspot that I use for the internet
- Earthlink
- star link for space x
- Comcast
- Nomad
- Its century link and Olypen
- ViaSat
- Trying to obtain
- Via Sat

9. What Internet service providers are available to you? (choose all that apply) (N=336)

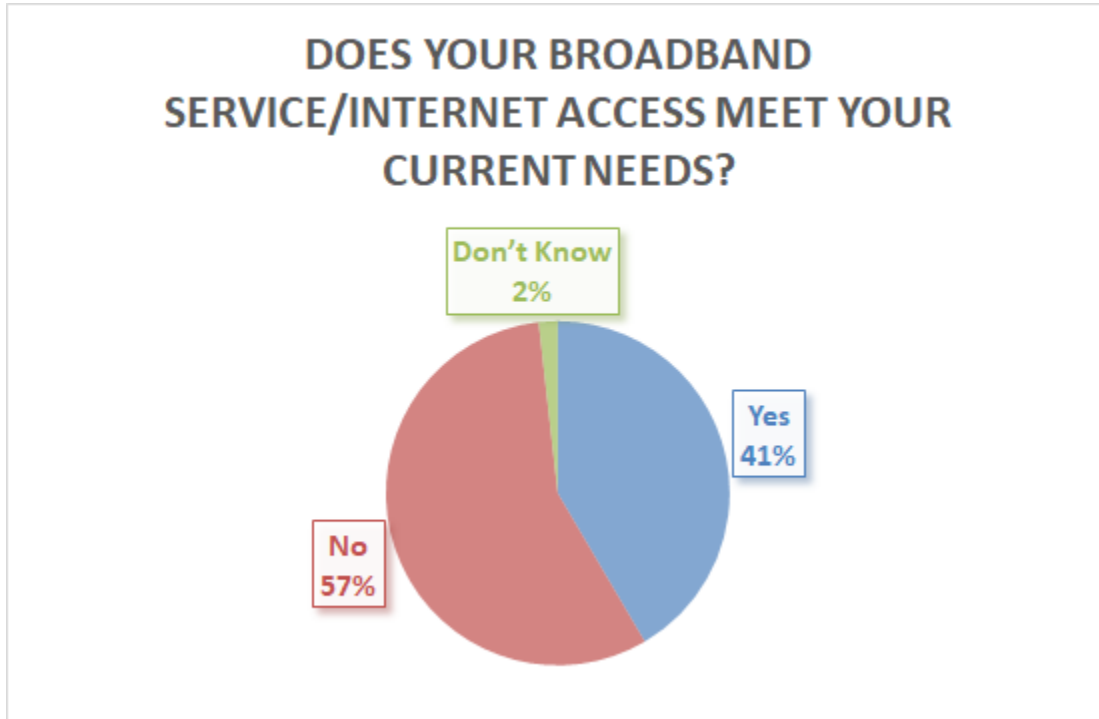
Service Providers	
Wave	42%
CenturyLink	66%
CresComm	3%
North Olympic Peninsula Data Centers	1%
Nikola	12%
OlyPen	25%
HughesNet	20%
WildBlue / Viasat	7%
Verizon Wireless	23%
AT&T Wireless	14%
T-Mobile/Sprint	9%
Dish	15%
Don't Know	20%
Other (please specify) N=9	3%

Other (please specify) (N=9)

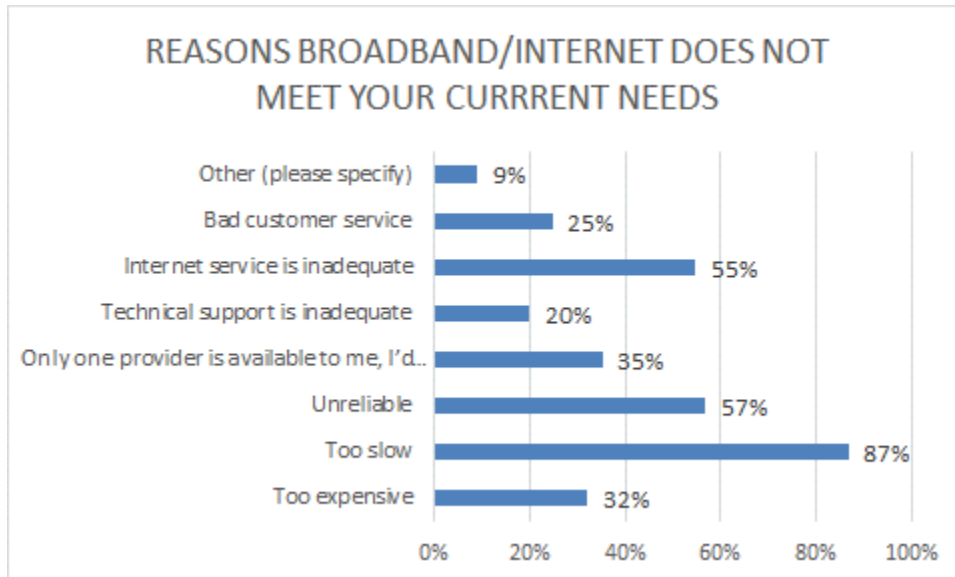
- CresComm wanted a \$1000 to install another tower, with no guarantees and prepayment. CenturyLink maxed out at 5 customers and wanted \$8,000 for another "hub"
- I don't think we have any wire internet service in this area; I've had Dish internet but it was too expensive due to data limits
- Comcast
- Both VERY POOR reception
- Neighbors who have used Hughes Net are dissatisfied. Other options also met with dissatisfaction according to neighbors.
- Technically all of them, but they all have poor performance because of the outdated cable
- I've tried to get Verizon, but it's not available and none of the other cell services work either since we are too close to the cell tower
- Not sure beyond the two selected
- Via Sat

10. Does your broadband service / Internet access meet your current needs? (N=337)

Yes	41% (N=140)
No	57% (N=191)
Don't Know	2% (N=6)



11. You indicated that your broadband service / Internet access does not meet your current needs. Please choose all the reasons as to why not. (N=190)



Other (please specify) (N=17)

- They offer 6 mbps.. I currently have a pair bonded line meaning 2 DSL lines and can still can't reach two mbps upload... That said they have fiber at the chicken coop junction they just need to move the line a block to support Ds 15 houses close by and probably enhance blyn springs residents too
- I am skeptical the service would be adequate if I had to work from home. Probably it would be too slow and I would be fearful of outages.
- CenturyLink took away the paired line we had for two years and they won't allow us to have our paired line back
- We are in beta testing for star link
- Century Link is the only affordable Service available
- In order to talk to a service rep, you wait on line for literally hours.
- Sometimes losing connection.
- Only a couple providers available, none with great service and limited about offered gbs
- Monthly data limits preclude us from using some internet services, such as streaming
- Insufficient infrastructure, i.e., lack of cable or fiber optic in the area. Wave offered service for \$100,000.
- Need new phone line which would be at my expense
- Slow speed does not allow access to internet banking, zoom meetings, etc.
- Monthly data cap is not sufficient for our needs
- Quest/CenturyLink promised fiber optic connection and speeds after we threatened a private LID up O'Brien and-down Deerpark
- Very limited service in my corner. Download is 13, upload is 1
- We have contacted are providers so many times about the inadequate service and tech support has been unable to resolve the issue and said that a technician would need to come out but that we would have to pay the \$200 fee for a technician. It is ridiculous

- When WAVE has outage then there is total &/or widespread outage
12. If you have broadband, or some type of internet access, how do you use it now (Choose all that apply)? (N=326)

Activity	Yes	No	Don't Know	N/A
Research retail prices and product information	98%	2%	0%	0%
Purchase goods and services	97%	2%	0%	0%
Keep in touch with family and friends	97%	3%	0%	0%
Online banking	95%	3%	0%	1%
Get local news	95%	4%	0%	1%
Retrieve local business information	95%	4%	0%	1%
Watching television or other videos	93%	7%	0%	0%
Retrieve medical information / telehealth / telemedicine	91%	7%	1%	1%
Share photos	89%	9%	1%	1%
Visit my local government's website	87%	10%	1%	2%
Education purposes, like remote learning	83%	15%	0%	2%
Find local, state or federal social services and government assistance, such as social security and housing	77%	20%	0%	3%
Find legal information	73%	23%	1%	3%
Contribute to a website, blog, or other online forum	63%	31%	1%	4%
Make telephone calls	60%	37%	1%	1%
Work from home (telework)	58%	37%	0%	5%
Retrieve local school information	52%	32%	0%	15%
Play video games	49%	48%	1%	2%
Sell goods or services	44%	47%	1%	8%
Support my home-based business	32%	53%	1%	14%
Language translation	32%	61%	1%	6%

Other (please specify) (N=16)

- My internet is not diquat and my neighbors are even worse we need help out here CenturyLink can fix it but they won't. they threatening to slow my speeds down as oppose to fixing it
- To obtain Maritime weather information and alerts.
- STAY SANE IN THE DARK MONTHS
- Mostly my kids need it for school, but we would also use it to watch family movies.
- Zoom yoga classes, library download services (e-books, audio books, & movies)
- Research for writing purposes, publications, and workshopping
- Keep in touch with family and friends outside the area.
- Zoom Board meetings, FaceTime, use of search engines, heavy e-mail usage, stream music and music videos, stream video programs.
- Currently – it takes days for me to upload photos to make books for my grandchildren – we have a smart TV we can't use – any video for church or just to watch buffer and stop

repeatedly – we can’t have anything like amazon prime, Hulu – all we have is direct TV – I’d like options

- These are the things I would like to do most times the service cannot connect or times out.
- Zoom meetings with volunteer organizations such as Soroptimist
- Internet cost is \$40.00 only because it is bundles with basic cable. We receive 13 stations for \$56. Our total bill is over \$100.00 for basically nothing and terrible service. If we don’t bundle with WAVE our internet jumps to \$70.00 a month. They have and hold a monopoly on the peninsula. I am in full support if you could bring competition to our area. Many people are living on fixed incomes. Also, it is unacceptable to know that any child or small business in our community cannot fully succeed due to inadequate internet service. Thank you for addressing this issue!
- Consult internationally in Aquaculture/Aquaponics
- Fitness/health – online exercise/workouts
- I am a Child Advocate (GAL). I attend court on zoom, communicate with foster parents etc. Also, I take care of an elderly relative and have not seen her in person in 7 months. We visit on Zoom. My husband is a freelance writer and uses the internet for meetings, presentations and research as well as communicating with publishers, editors etc.
- social media, research

13. What are the most important aspects of broadband service and internet access for you in the future? (choose all that apply) (N=347)

Aspects of Broadband Service and Internet Access	Percentage
<i>Cost of service</i>	72%
<i>Speed of the connection</i>	94%
Choice of Internet providers	33%
<i>Reliable access to the Internet</i>	87%
Billing practices of the Internet provider	21%
Ease of use	36%
Installation / repair technician’s ability and courteousness	26%
Technical support services	41%
Customer Service representative’s ability and courteousness	33%
Having Broadband / Internet service available in my area	59%
Other (please specify)	3%

Other (please specify) N=9

- Data limitations
- Century Link sends their customer service to Central America and/or the Philippines where English is not spoken well.
- More balanced upload availability. 250 down is all good but if you only have 15 up you still can’t really do much if two people are trying use upload intensive things.
- Fast internet

- Please get better, faster service. I had Comcast before I moved here. I used to complain about their lousy service. Now I would give anything to have their service here.
- Latency; my previous satellite service had high latency, my wireless service is unreliable and has a data cap that precludes streaming, would like a wire/fiber connection. No such broadband available.
- Public owned internet utility would be great.
- I know someone who got CPS downtown in PA, I had an office there to use it my after I left Battelle and lost my T-1 line there
- Just having service that works would be nice.

14. Any other comments? (N=85)

Respondents with No Internet (N=8)

- I hope to find a provider that has value for the dollar. I don't want internet, tv and phone bundled and internet only for 80% of that amount.
- Nikola came to our home in 2019 and did an assessment and said there were too many trees to the east of us to get PA, their service. I've read that satellite internet is less than ideal.
- Would be nice to have a choice but... Cost is also important
- We have tried so many internet companies that at satellite and they can't do it from our home. Wave refuses to wire for internet to our location unless we pay an outrageous amount of money.
- Internet access is a major problem in rural life, creating a barrier for opportunities (educational, business, etc.) which urban people take for granted. Thank you for collecting data on this issue.
- "Internet Broadband access in my location is not available.
- Most importantly, this is a safety and EMS deficit. And also, cannot reliably use internet for work, in my case as a physician. Thank you, a lot, for the consideration. This is really important. "
- Just moved into the area after 35 years making various companies successful in around cutting-edge technologies. Was hoping to pass my knowledge along to the up-and-coming youth in the area in the form of training and practical applications. High speed internet access is crucial in my goal.

Respondents with Internet and No Broadband (N=48)

- Holy crap, internet in Clallam County is terrible outside town. Feel free to email me for extra details if interested. The condensed version from 3 months of trying: only available internet at my house is satellite (which we can't get them to setup even though we can pay them -labor shortage?) T-Mobile "unlimited" plan that drops constantly and is about 1 mb download when reception is good and there's not a heavy load. CenturyLink lied to us and provides internet to our neighbors but maxes out at 5 customers. They want \$8,000 to install another hub (even then it's only "up to 10 mbs". I rent, so I'm not paying that. Crescomm cannot wif as the antenna doesn't reach us. Fun fun. I commute to my friend's house M-F to use her Wave cable. You guys have got your work cut out for you! Thanks for at least investigating/tiring. Good luck!

- Currently me and many of my neighbors only have cell service for internet. This presents a safety issue when the cell tower goes down. I also work from home due to Covid and I need reliable, faster internet service than a hot spot to do my job effectively. Thank you for your efforts to bring the county into the current century.
- My internet is so bad I had to turn it off to take this survey. Makes remote learning at home impossible for my kids
- On Lower Place Road CenturyLink only offers 3 Mbps download and 0.7 Mbps upload speeds, which are horribly inadequate for most any purposes, let alone during the COVID pandemic when my kids and family need to do school and work online. Many calls to CenturyLink to ask for faster internet service have not met with any pledges to upgrade or any changes, and there are no other feasible providers.
- “ Safety Mode”, provided by Verizon when you approach the 30 GB limit on their plan, is useless. It takes minutes or longer for one line of email. Satellite internet, provided by HughesNet, has frequent drop outs requiring repeated log ins with the loss of information when on an encrypted (financial) site.
- AT&T and Verizon provide the same limited high-speed internet, not adequate
- PLEASE bring better internet service to the west end of the Olympic Peninsula- seriously, we have tried everything. Satellites don’t work because of trees, and Cresscom is highway robbery. As a family with 3/4 online learners, maintaining our access to education is vital and we Are Struggling. Please help.
- Before the virus we got used to not having internet, or very basic internet. Now with the virus my kids need reliable internet for school (we have 6th, 8th, 2 high students, and 1 college). We are disconnecting our HughesNet due to poor service and lack of speed. It doesn’t allow the kids to watch any of the videos needed. We have a hot spot from Verizon that we use which is better but doesn’t last for the month. We could use some reliable internet. I am also starting a home-based business which I need reliable internet.
- “I have extremely poor internet speed one unreliable more often than necessary. I don’t mind paying for good service but resent paying for extremely slow service because it’s the only one available that does not have restrictive or insane data usage charges or practices”
- The location of our house is such that cell service is spotty from all cellular providers, so true broadband (per definition) internet access via other means is extremely important to us. Thank you.
- We are at the end of a small road, in the trees, and although we researched other possibilities, a wifi hotspot is the only method of internet access available to us at this time.
- This survey is timely. It took me ten minutes to open Outlook to access an email a neighbor sent me concerning this survey. I tried to download the survey three times, and each attempt met with failure. During any given Internet session, the Verizon Mobile Hot Spot accessed through a tablet will bounce me off. I do research on the Internet for writing projects, and the unreliable Internet access I have is frustrating and time-consuming. I am hoping I can now save this survey and be able to email it back to you. Thank you for this opportunity and for your work.
- No cellular phone service is available on upper Palo Alto Rd. The landlines are so old that they won’t even carry a DSL signal. The landline literally hangs on a barbed wire fence up here, but Century Tel has indicated they have no plans to upgrade the lines here. Satellite is our only option for the internet and the speed and data limits are problematic. It

is very expensive for poor internet access. Thanks for your efforts to upgrade internet service in Clallam County.

- Century link claims we are getting 1.
- Not only is slow internet affecting my own life, but I have had two people decide against my rental on the adjacent property because internet was not good enough.
- Nikola is my provider and provides excellent service, however 6 mb down and 2 mb is inadequate for today's needs including working from home doing video conferences (MS Teams)
- We need reliable high-speed internet that is affordable. We currently have only one satellite-based internet service as our option. Wave broadband access stops a 1/2 mile from us
- I am paying my provider, HughesNet for broadband service, 25 Mbps. I can get 25 Mbps starting about midnight and it starts to diminish to about 5 Mbps by 9:00 AM. After that it drops to about 200 to 500 Bps (Note: bits per second !!!!) and stays at this speed until about 11:00 PM. I have looked into cable, but the cable company available the last time I checked (about 3 years ago) wanted \$18,000.00 to run cable to my house.
- We have been talking about this for years. Obama made a campaign promise in 2007 to have robust internet nationwide. Still not done. The government must fix this, just they electrified rural America and provided phone service. This is basic infrastructure. Get it done!!!!
- "At the very best, on a perfect day we get 1.7 mbps. There are three people extremely struggling to do their school work (2 in college and one in high school). Most of the time they have to go and sit in the JC Penny's parking lot (because of the better internet) to do school work. All this for \$200 per month from century link."
- "Nothing is going to change for those of us in the boondocks because there's no money in running fiber down the road. Fixed Point Wireless doesn't do much with our terrain and trees. I'm 'down in the hole' and Crescomm can't get me. Fiber's only at most a half a mile from my house – but no one (CenturyLink) is going to run it to my door. CenturyLink is letting their already terrible DSL rot without maintenance; every year it gets slower. I'll fill out the survey, but we all know nothing's going to change for anyone more than a few miles from city limits."
- Would really love for cable to be run up Obrien Rd
- The maximum speed available at my address is 1.5 Mb/sec download and 0.86 Mb/sec upload. Actual speeds are typically less.
- Since cell service is also poor in my area, I worry about losing my landline.
- We've lived here more than 25 years and Internet continues to fail to meet expectations. We can pay, but cannot get reliable, high-speed internet services
- I am not opposed to having the county being the ISP
- We typically get 1-2 Mbps service (download) and about 0.5 upload from Century Link. We live in Zip code area 98363, but near Sappho in the Sol Duc Valley. Internet service unacceptable here. Tried Hughes, but it was insanely expensive, unreliable and they were just plain rude. Can't believe we don't have adequate internet infrastructure in 2021. Waiting for Starlink...
- "Since 2001, I had Olypen/Century Link. Olypen was excellent! CenturyLink was terrible –outages, lack of customer service. In August, 2020, when I changed CenturyLink plans, my internet was cut off even though I still continued to be billed. After ten days of calls to

CenturyLink, with Olypen advocating for me, and with no restoration of service, I decided to dump CenturyLink. I would have liked to continue with Olypen but their service didn't extend to my area (Dungeness Spit). Olypen recommended Nikola. Nikola was able to serve me. I pay \$70 per month for 10mbit/s download and 3mbit/s upload. Please note I filled a complaint against CenturyLink with the Washington State Trade and Utilities Commission and with the State Attorney General. The Attorney General is investigating my complaint."

- "We have very slow Internet service. We can watch YouTube (on good days) but can't stream movies. When it rains the service is really slow or it goes down completely."
- We have lived in this house for almost four years. I've been fairly satisfied with CenturyLink, which was the only Internet service available when we moved here in February 2017. I have not checked to see if any other providers come to my house.
- We struggle with our service. The speed is not available to us and the cost for the slow speed is very expensive. We need something done about this in rural Blyn. It's very hard to keep up with work.
- My husband I both work from home full time. Our son is home from The University of Washington doing full time remote, and our other son is a high school student doing full time remote. All with 9 MB down and less than 2 up. I keep searching for better service but am told it's all that is available to me in happy valley.
- Would like better and more reliable internet services with greater speed. High speed internet. Needing to use Satellite internet is good but not adequate. Cannot run a business from home.
- The internet options west of Joyce are awful. Please help
- With only one provider there isn't much choice
- "Funds Available to Provide Rural Broadband, Department of Agriculture. The Community Connect Grant Program offers financial assistance to provide broadband service to all premises in rural, economically-challenged communities where broadband service does not exist. Applicants are encouraged to consider projects that provide measurable results in helping rural communities build robust and sustainable economies through strategic investments in infrastructure, partnerships, and innovation. The application deadline is December 23, 2020."
- I have done extensive research into the lack of connectivity in my local neighborhood and will inform you of my findings via a separate email. Thanks!
- "When I left Norfolk, VA in 1995 I had 28 kbs at home. Olypen was 8 kbs ... staggered to 16 kbs ... but I had a T-1 line at Battelle. In 2004 I left Olypen and connected through Quest to what I have now, but I had 6 lines. Down to 3 now but mostly use ATT on the road and on foreign travel... wife uses local ATT for FaceTime with grandkids ...occasional dropouts....,"
- Our adult daughter moved to Puyallup and needed to get fast internet access for her work. For about the price we are paying here she has 30X the speed at her apartment.
- Our neighbors both have Century Link, but our corner is not connected. CL wanted almost \$8,000 to connect between 3 houses. Nope.
- "Internet companies won't spend money on rural fiber because ""there's not enough demand"". In fact, Wave won't even extend their cable the extra mile into our area. Internet businesses and tech workers, who would pay for gigabit internet, won't move to rural areas because of the lack of access. If you build it, they will come. Countries where internet is

considered a utility, not a luxury, have a proliferation of internet reliant businesses in rural areas. By “rural” we’re not even talking about being 10 miles out on a dirt road, in PA you lose internet access a couple of miles off of highway 101 – where the fiber backbone for the county is located. This is all about greed and stockholder profits over service to the community.”

- DSL is my only real choice here on Happy Valley Road. Recently experienced period of horrible service. We would be “Not connected to the Internet” numerous times in an hour. Literally on while I read this page and no internet while I scroll down, then up, now down, back up and so forth. Bottom line, CenturyLink techs discover that I’m over 5000 ft further from the server farm than the limits allow And I should NEVER have been hooked up for service in first place. And there are numerous other clients further downstream from me-even further away. I have resolved slightly by investing in an iPad with 4G LTE that can access internet when Clink can’t. Not ideal and does not resolve home LAN/internet issues. Get us access to starlink!
- Cell service is poor in my area and cannot do wifi calling because of latency with satellite internet
- Nikola is great. Excellent customer service and uptime. But not all our neighbors have line of sight to a transmitter. And we’d like to have faster speed for videoconferencing, etc. but we’re grateful to have what we have!
- I have to conduct some of my business work at my house and our internet connection is so terrible that the majority of time, I disconnect from our wireless internet and connect my computer to my smartphone using hotspot because that is a better connection.....we do the same thing with streaming video.... it’s often better just to use our mobile hotspot as the connection.... however, our cell service isn’t always reliable so, at times, we have no internet access.
- I would be willing to pay more. College students, home based business and remote work from home uses.
- Lost Mountain is a patchwork of solutions to internet. No one is entirely satisfied. It depends on what bend of the road or aspect of the hill, or how many trees are around you. We have a group of residents who communicate about solutions and we have been in touch with Russ Elliott from the State office. I am the point person for the group. We are representative of many roads in rural Clallam County. Century Link is not interested in upgrading infrastructure. We use a Verizon Jetpack hotspot for backup because our CL speeds are 1.5/.7 on a good day, and non-existent at other times. Doing the best we can. Thanks for all of the work you are doing to bring better service across the county.
- Our satellite internet connection through Hughes is a joke. It is expensive, unreliable and slow. Crescomm quoted me an equipment install of over \$1000 and couldn’t promise speeds higher than what I get through satellite, though he thought it would be more reliable. A lack of solid broadband such as CenturyLink or Wave is a daily source of frustration for our personal lives and hampers my wife’s ability to run her business.

Respondents with Broadband (N=27)

- 5G please
- Broadband internet access should be considered a utility similar to water and electricity.
- Only one provider is available at my residence. WAVE seems to have a monopoly over Port Angeles and their prices are astronomical. There needs to be more providers in town so individuals have options between providers.
- Century Link has terrible Technical service hours. They just don't care! Two in the field service technicians for the entire Clallam County? Gimme a break!
- I am able to pay my current bill for monthly service, but many are not especially now with so many being out of work, but it is so needed for remote learning and working. There are many areas the internet is not accessible in this county. Toward Freshwater Bay and down Vert road the service is horrible. My son split his time between his dad and my home, but due to Covid he spent the last three months at my house (in town) because of the internet issues. I know a lot of kids are having issues with school and the internet. Some is the area they live in and some is the cost.
- At our location the line in is old and band aided together thus breaks often in storms. Century link, our only option, won't replace the line. Current speeds: 7.13 download / 0.51 upload
- Century Link has service technicians who want to do a good job. They are limited by corporate greed and are not provided with adequate resources and/equipment to do a superb job. Century Link does not want to provide any more service to remote/suburban areas than it has to. There costs are high for service received. I was constantly transferred to a Central American country or the Philippines. I live in the USA. I EXPECT and DEMAND that my communication services be taken care of domestically!! In short, Century Link is pitiful.
- Our neighborhood on Lower Place Rd (some 50 properties) has teachers, doctors, business owners, some elderly, yet we are limited to slow speeds regardless of ISP. Willing to pay more for speed but within reason.
- Prices are arbitrarily kicked upwards
- "We previously had Century Link it was only \$45-\$50 per month but we were unable to stream effectively. Wave has a line on our road (Harbor View) they brought the cable down our driveway and we are happily paying \$64/mo it's reliable and we stream all we want. Not sure if the line continues past our home."
- Connection becomes unstable during high use times.
- My speed test was unusually high today. Usually down in the 20s. Service disappears frequently with no warning. Wireless is way better than satellite, but still feels pretty vulnerable to provider's sole tower reaching my home.
- Public owned internet utility would be great. See Longmont CO for example.
- Wave Broadband doesn't always deliver the speed that is contracted. There are also outage issues as well.
- The ISP's need to build and invest in more infrastructure in the rural and semi-rural areas of Clallam County as soon as possible
- Satisfied with current access
- wish there were reasonable competition to Wave but there just isn't. I hate having to play their billing games but it's the only game in town.

- Love Nikola
- Stability within the network is important
- Yeah, all of the major providers are raising their prices beyond the cost of living for Clallam County. I may be single but I know many working families with multiple incomes who still struggle.
- one great thing about wave cable is the reliability. The times that it does go down I can hotspot my vary reliable Verizon phone service to take over. Shoot the power goes out before my internet usually does. And when that happens, I power up my modem and router and laptop with a 12v/110v inverter and I'm still surfing.
- The fiber optic trunk line for the Peninsula, that was upgraded during the widening of Hwy 101, runs along our side of the street on West Washington. I inquired about gaining access when it was installed but was denied. Prior to moving here in 2012 we had high speed triple play residential fiber access for more than 10 yrs. At a competitive rate. 18 yrs. Later its high time for this county to catch up.
- Multiple providers breeds better prices and customer service as well as increased consumer services
- Wave S-U-C-K-S, SUCKS. Would love to have a RELIABLE alternative that can match their data limits/speed combinations.
- Internet Service should become a public utility like the phone system or cable. We ensure cable for every house in every new subdivision but not internet access.
- Only that we leased for a while at Diamond Point as we were looking for our home when we first moved here 8 years ago, and we quickly learned to ask about service as we were looking at available homes...
- "Our household must have reliable broadband/internet to be able to do our jobs and schoolwork; No reliable internet = no income; No reliable internet = no education; Over the dozen years that we've been living in the Sequim School District we have found that most homes outside of the Sequim City limits do NOT have reliable internet service; When house-hunting, we have asked how much would it cost to get reliable internet run to specific addresses around/outside of Sequim..., and have been quoted amounts ranging from \$5k (to an address within a mile of John Wayne Marina) to \$30k depending upon how far from one of Wave's already existing ""nodes""!!; Lack of reliable internet has severely limited where we can live within the Sequim School District; WiFi Hotspots via cell phone service isn't currently an option everywhere in the school district because there are areas that just do not have reliable cell phone service; and I feel strongly that Sequim and Clallam County *must* invest in and participate in the expansion of reliable broadband internet to fulfill the needs of our students, households, employees, and employers!"

Additional Information Regarding Respondents with No Internet (N=21)

Zip Codes (N=21)

Zip Code	Respondent	Percentage
98382	11	53%
98363	7	33%
98362	3	14%

100% are Residents

Most Important Aspects of Broadband Service and Internet Access (N=20)

Aspects	Percentage
Cost of service	65%
<i>Speed of the connection</i>	80%
Choice of Internet providers	15%
<i>Reliable access to the Internet</i>	95%
Billing practices of the Internet provider	15%
Ease of use	25%
Installation / repair technician's ability and courteousness	25%
Technical support services	10%
Customer Service representative's ability and courteousness	15%
<i>Having Broadband / Internet service available in my area</i>	75%

Additional Information Regarding Respondents with Internet and No Broadband Services (N=150)

Zip Codes (N=150)

Zip Code	Respondent	Percentage
98382	55	37%
98363	47	31%
98362	40	27%
98331	3	2%
98305	2	1%
98326	2	1%
98381	1	1%

Residents 96% (N=144)
 Business 3% (N=4)
 Both 1% (N=2)

Current Internet Provider (N=150)

Internet Provider	Percentage
Wave	10%
<i>CenturyLink</i>	<i>51%</i>
CresComm	1%
Nikola	8%
OlyPen	3%
HughesNet	5%
WildBlue / Viasat	3%
Verizon Wireless	8%
AT&T Wireless	3%
Dish	2%
Don't Know	1%
Other (please specify)	5%

Other (N=7)

- T-Mobile (with data caps and poor reception – bout 1-2 bars)
- don't have Broadband; I do have Verizon cellphone service and a Hotspot that I use for the internet
- Earthlink
- Nomad
- Its century link and Olypen
- Trying to obtain
- Via Sat

Internet Service Providers Available (N=149)

Provider	Percentage
Wave	13%
CenturyLink	64%
CresComm	5%
Nikola	13%
OlyPen	15%
HughesNet	26%
WildBlue / Viasat	11%
Verizon Wireless	23%
AT&T Wireless	13%
T-Mobile/Sprint	6%
Dish	12%
Don't Know	18%
Other (please specify)	5%

Other (N=7)

- CresComm wanted a \$1000 to install another tower, with no guarantees and prepayment. CenturyLink maxed out at 5 customers and wanted \$8000 for another “hub”
- I don’t think we have any wire internet service in this area; I’ve had Dish internet but it was too expensive due to data limits
- Both VERY POOR reception
- Neighbors who have used Hughes Net are dissatisfied. Other options also met with dissatisfaction according to neighbors.
- Technically all of them, but they all have poor performance because of the outdated cable
- I’ve tried to get Verizon, but it’s not available and none of the other cell services work either since we are too close to the cell tower
- Via Sat

Does your Internet Access meet your current needs? (N=150)

Yes 18%
 No 81%
 Don’t Know 1%

You indicated that your Internet access does not meet your current needs. Please choose all the reasons as to why not. (N=121)

Reasons for not meeting needs	Percentage
Too expensive	26%
<i>Too slow</i>	91%
<i>Unreliable</i>	55%
Only one provider is available to me, I’d like to have a choice.	33%
Technical support is inadequate	17%
<i>Internet service is inadequate</i>	62%
Bad customer service	24%
Other (please specify)	9%

Other (N=11)

- They offer 6 mbps.. I currently have a pair bonded line meaning 2 DSL lines and can still can’t reach two mbps upload... That said they have fiber at the chicken coop junction they just need to move the line a block to support maps 15 houses close by and probably enhance blyn springs residents too
- CenturyLink took away the paired line we had for two years and they won’t allow us to have our paired line back
- In order to talk to a service rep, you wait on line for literally hours.
- Only a couple providers available, none with great service and limited about offered gbs
- Monthly data limits preclude us from using some internet services, such as streaming

- Insufficient infrastructure, i.e., lack of cable or fiber optic in the area. Wave offered service for \$100,000.
- Need new phone line which would be at my expense
- Slow speed does not allow access to internet banking, zoom meetings, etc.
- Quest/CenturyLink promised fiber optic connection and speeds after we threatened a private LID up O'Brien and-down Deer park
- Very limited service in my corner. Download is 13, upload is 1
- We have contacted are providers so many times about the inadequate service and tech support has been unable to resolve the issue and said that a technician would need to come out but that we would have to pay the \$200 fee for a technician. It is ridiculous

What are the most important aspects of broadband service and internet access for you in the future? (choose all that apply) (N=147)

Important Aspects of Broadband /Internet	Percentage
Cost of service	59%
Speed of the connection	95%
Choice of Internet providers	32%
<i>Reliable access to the Internet</i>	84%
Billing practices of the Internet provider	16%
Ease of use	37%
Installation / repair technician's ability and courteousness	27%
Technical support services	39%
Customer Service representative's ability and courteousness	33%
<i>Having Broadband / Internet service available in my area</i>	69%
Other (please specify)	3%

Other (N=4)

- fast internet
- Please get better, faster service. I had Comcast before I moved here. I used to complain about their lousy service. Now I would give anything to have their service here.
- Someone I know got CPS downtown in PA, I had an office there to use it it after I left Battelle and lost my T-1 line there
- Just having service that works would be nice.

Additional Information Regarding Respondents with Broadband Services (N=198)

Zip Codes (N=198)

Zip Code	Respondent	Percentage
98382	83	42%
98362	53	27%
98363	49	25%
98331	10	5%
98305	1	0.5%
98636	1	0.5%
98381	1	0.5%

Residents 90% (N=179)
Business 8% (N=16)
Both 2% (N=3)

Current Broadband Provider (N=187)

Broadband Provider	Percentage
<i>Wave</i>	58%
<i>CenturyLink</i>	25%
Nikola	5%
OlyPen	7%
HughesNet	1%
WildBlue / Viasat	0.5%
Verizon Wireless	0.5%
AT&T Wireless	0.5%
T-Mobile/Sprint	0.5%
Dish	0.5%
Other (please specify)	2%

Other (N=3)

- Star link for space x
- ComCast
- ViaSat

Broadband providers available (N=187)

Providers Available	Percentage
<i>Wave</i>	65%
<i>CenturyLink</i>	67%
CresComm	1%
North Olympic Peninsula Data Centers	1%
Nikola	11%
OlyPen	33%
HughesNet	14%
WildBlue / Viasat	4%
Verizon Wireless	24%
AT&T Wireless	16%
T-Mobile/Sprint	11%
Dish	17%
Don't Know	21%
Other (please specify) – Comcast	1%

Does your broadband service / Internet access meet your current needs? (N=187)

Yes 60%
 No 37%
 Don't Know 3%

You indicated that your broadband service / Internet access does not meet your current needs. Please choose all the reasons as to why not. (N=69)

Reasons	Percentage
<i>Too expensive</i>	43%
<i>Too slow</i>	80%
<i>Unreliable</i>	59%
Only one provider is available to me, I'd like to have a choice.	39%
Technical support is inadequate	26%
<i>Internet service is inadequate</i>	42%
Bad customer service	26%
Other (please specify)	9%

Other (N=6)

- I am skeptical the service would be adequate if I had to work from home. Probably it would be too slow and I would be fearful of outages.
- We are in beta testing for star link
- Century Link is the only affordable Service available
- Sometimes loosing connection.

- Monthly data cap is not sufficient for our needs
- When WAVE has outage then there is total &/or widespread outage

What are the most important aspects of broadband service and internet access for you in the future? (choose all that apply) (N=180)

Most Important Aspects of Broadband/Internet	Percentage
<i>Cost of service</i>	83%
<i>Speed of the connection</i>	95%
Choice of Internet providers	37%
<i>Reliable access to the Internet</i>	89%
Billing practices of the Internet provider	26%
Ease of use	37%
Installation / repair technician's ability and courteousness	26%
Technical support services	45%
Customer Service representative's ability and courteousness	36%
Having Broadband / Internet service available in my area	48%
Other (please specify)	3%

Other (N=5)

- Data limitations
- Century Link sends their customer service to Central America and/or the Philippines where English is not spoken well.
- More balanced upload availability. 250 down is all good but if you only have 15 up you still can't really do much if two people are trying use upload intensive things.
- Latency; my previous satellite service had high latency, my wireless service is unreliable and has a data cap that precludes streaming, would like a wire/fiber connection. No such broadband available.
- Public owned internet utility would be great.

Specific Information Regarding Business/Home Business Respondents (N=25/7%)

Broadband service at your place of business (N=25)

Yes 76%
 No 20%
 Don't Know 4%

Reasons for no Broadband service at business (N=5)

Reason	Percentage
Cost / too expensive	20%
Not available in my area	60%
Poor opinion of available providers	20%
My Internet service cannot provide broadband speeds	60%
The provider I want is not in my area	40%
My smartphone is all I need	20%
Other (please specify) – ATT wireless with new MIMO array on Hwy 101 coming on line now	20%

Current Broadband/Internet Provider. (N=24)

Provider	Percentage
Wave	33%
CenturyLink	46%
Nikola	4%
OlyPen	8%
T-Mobile/Sprint	4%
Other (please specify) – Comcast	4%

Broadband/Internet Providers Available. (N=24)

Provider	Percentage
Wave	46%
CenturyLink	75%
Nikola	13%
OlyPen	33%
HughesNet	8%
Verizon Wireless	17%
AT&T Wireless	4%
T-Mobile/Sprint	4%
Dish	13%
Don't Know	25%
Other (please specify) – Comcast	4%

Does your broadband service / Internet Access meet your current needs? (N=24)

Yes 33%
 No 67%

Reasons Broadband/Internet does not meet needs (N=16)

Reasons	Percentage
Too expensive	19%
Too slow	88%
<i>Unreliable</i>	50%
Only one provider is available to me, I'd like to have a choice.	44%
Technical support is inadequate	19%
<i>Internet service is inadequate</i>	63%
Bad customer service	25%
Other (please specify)	19%

Other (N=3)

- Century Link is the only affordable Service available
- Quest/CenturyLink promised fiber optic connection and speeds after we threatened a private LID up O'Brien and-down Deer park
- When WAVE has outage then there is total &/or widespread outage

How Businesses use Broadband / Internet Access (N=23)

Activities	Yes	No	Don't Know	NA
Retrieve local business information	95%	0%	0%	5%
<i>Watching television or other videos</i>	91%	9%	0%	0%
<i>Visit my local government's website</i>	91%	5%	0%	5%
<i>Get local news</i>	91%	5%	0%	5%
Education purposes, like remote learning	90%	10%	0%	0%
Find legal information	90%	10%	0%	0%
Online banking	87%	9%	0%	4%
Research retail prices and product information	86%	9%	0%	5%
Sell goods or services	84%	11%	0%	5%
Purchase goods and services	83%	13%	4%	0%
Contribute to a website, blog, or other online forum	80%	15%	5%	0%
Retrieve local school information	79%	16%	0%	5%
Keep in touch with family and friends	77%	23%	0%	0%
Share photos	76%	19%	0%	5%
Find local, state or federal social services and government assistance, such as social security and housing	76%	24%	0%	0%
Work from home (telework)	68%	32%	0%	0%
Make telephone calls	65%	30%	5%	0%
Retrieve medical information / telehealth / telemedicine	65%	25%	10%	0%
Support my home-based business	64%	32%	5%	0%
Language translation	53%	42%	0%	5%
Play video games	37%	63%	0%	0%

Other (N=2)

- To obtain Maritime weather information and alerts.
- Consult internationally in Aquaculture/Aquaponics

Most important aspects of Broadband service and Internet Access for your Business (N=23)

Important Aspects of Broadband/Internet	Percentage
<i>Cost of service</i>	70%
<i>Speed of the connection</i>	96%
Choice of Internet providers	43%
<i>Reliable access to the Internet</i>	96%
Billing practices of the Internet provider	30%
Ease of use	43%
Installation / repair technician's ability and courteousness	17%
Technical support services	57%
Customer Service representative's ability and courteousness	35%
Having Broadband / Internet service available in my area	48%
Other (please specify) – Karen Rodgers got CPS downtown in PA , I had an office there to use it if after I left Battelle and lost my T-1 line there	4%

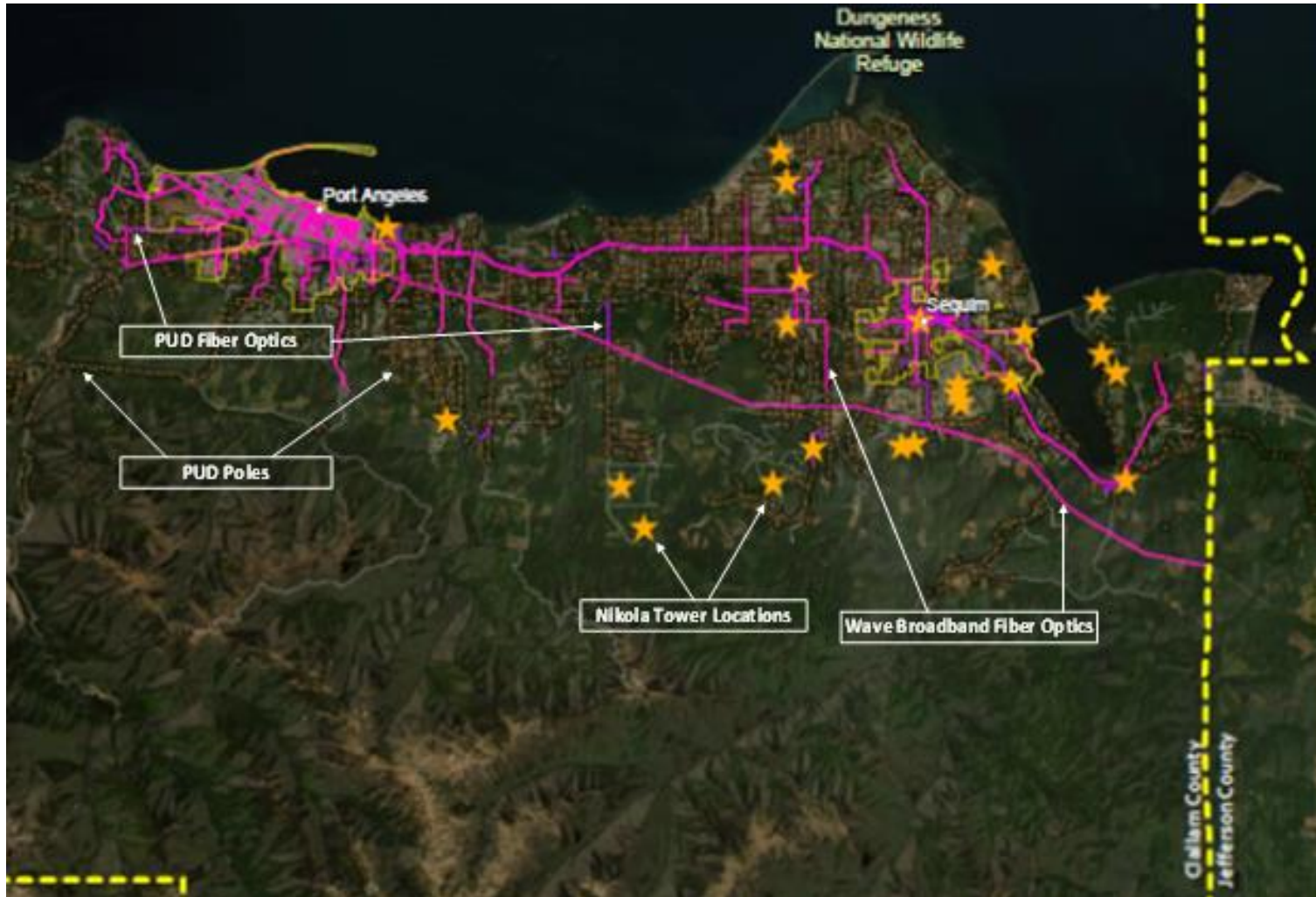
Additional Comments. (N=7)

- My internet is so bad I had to turn it off to take this survey. Makes remote learning at home impossible for my kids
- Our neighborhood on Lower Place Rd (some 50 properties) has teachers, doctors, business owners, some elderly, yet we are limited to slow speeds regardless of ISP. Willing to pay more for speed but within reason.
- “When I left Norfolk, VA in 1995 I had 28 kbs at home. Olypen was 8 kbs ... staggered to 16 kbs ... but I had a T-1 line at Battelle. In 2004 I left Olypen and connected through Quest to what I have now, but I had 6 lines. Down to 3 now but mostly use ATT on the road and on foreign travel... wife uses local ATT for FaceTime with grandkids ...occasional dropouts....,”
- “Internet companies won’t spend money on rural fiber because “there’s not enough demand”. In fact, Wave won’t even extend their cable the extra mile into our area. Internet businesses and tech workers, who would pay for gigabit internet, won’t move to rural areas because of the lack of access. If you build it, they will come. Countries where internet is considered a utility, not a luxury, have a proliferation of internet reliant businesses in rural areas. By “rural” we’re not even talking about being 10 miles out on a dirt road, in PA you lose internet access a couple of miles off of highway 101 – where the fiber backbone for the county is located. This is all about greed and stockholder profits over service to the community.”

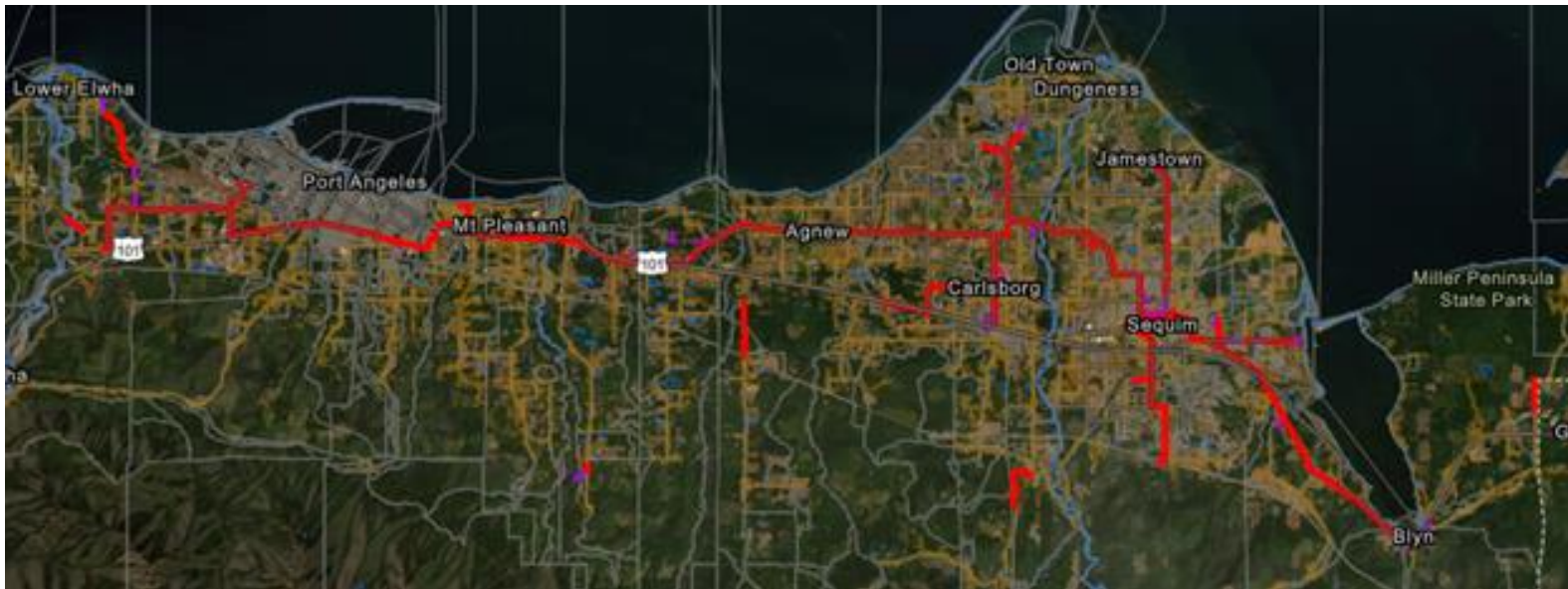
- Multiple providers breeds better prices and customer service as well as increased consumer services
- I would be willing to pay more. College students, home based business and remote work from home uses.
- “Our household must have reliable broadband/internet to be able to do our jobs and schoolwork; No reliable internet = no income; No reliable internet = no education; Over the dozen years that we’ve been living in the Sequim School District we have found that most homes outside of the Sequim City limits do NOT have reliable internet service; When house-hunting, we have asked how much would it cost to get reliable internet run to specific addresses around/outside of Sequim..., and have been quoted amounts ranging from \$5 k (to an address within a mile of John Wayne Marina) to \$30 k depending upon how far from one of Wave’s already existing “nodes”!!; Lack of reliable internet has severely limited where we can live within the Sequim School District; WiFi Hotspots via cell phone service isn’t currently an option everywhere in the school district because there are areas that just do not have reliable cell phone service; and I feel strongly that Sequim and Clallam County **must** invest in and participate in the expansion of reliable broadband internet to fulfill the needs of our students, households, employees, and employers!”

EXHIBIT H – Broadband and Internet Infrastructure and Coverage Maps

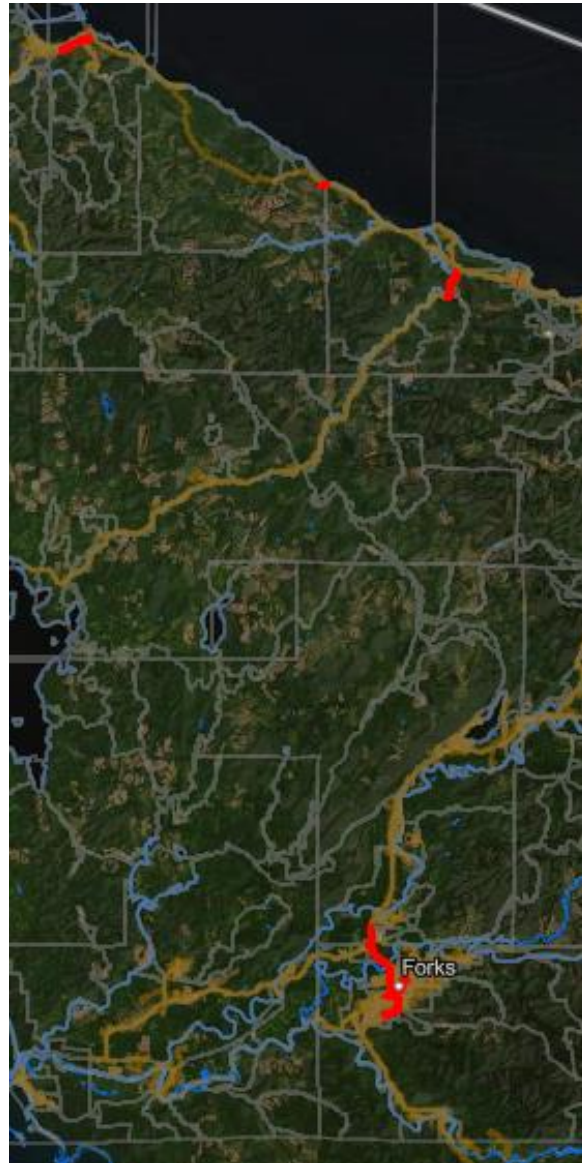
Exhibit H – Broadband and Internet Infrastructure and Coverage Maps



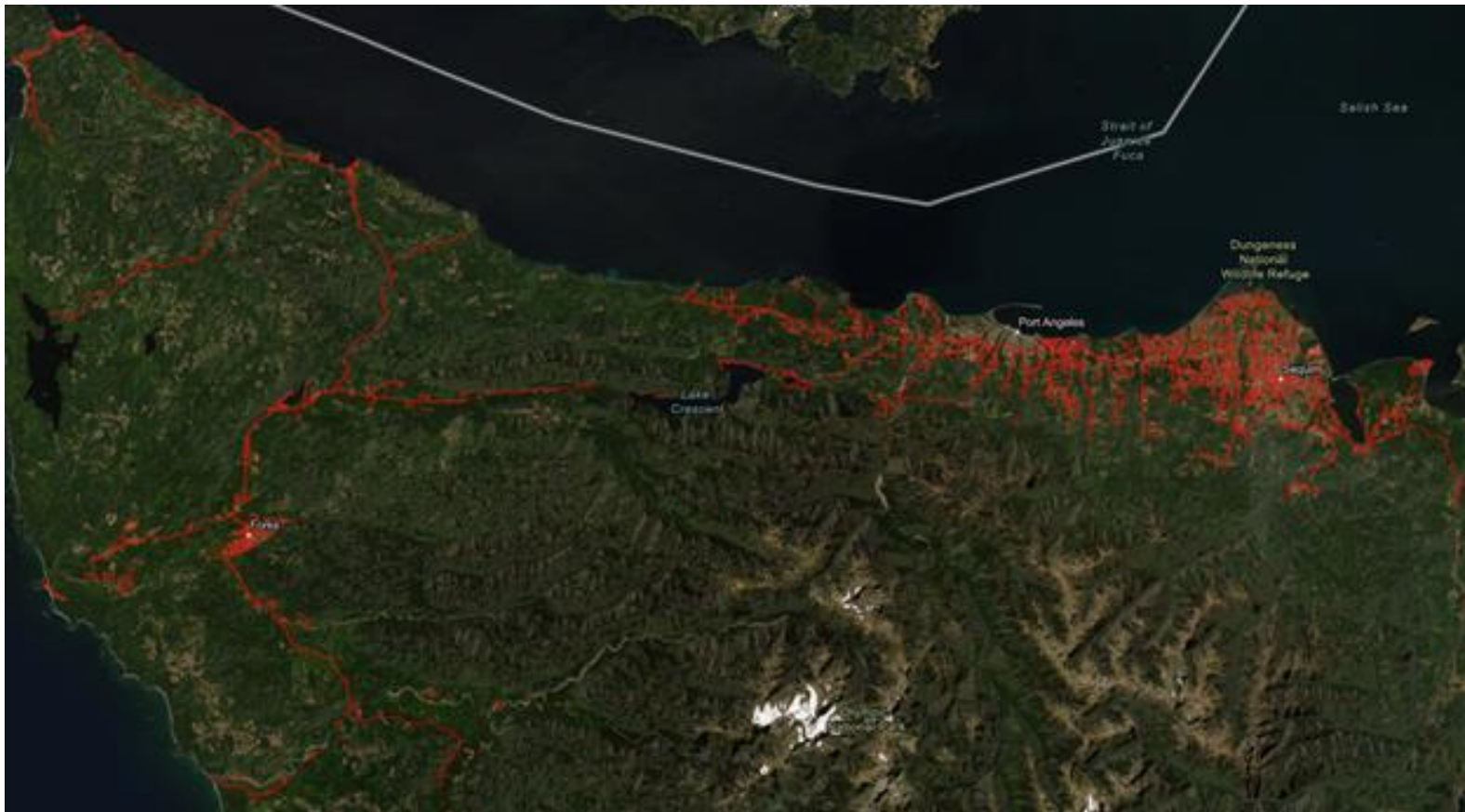
Nikola tower locations, and PUD and Wave fiber optic cables.



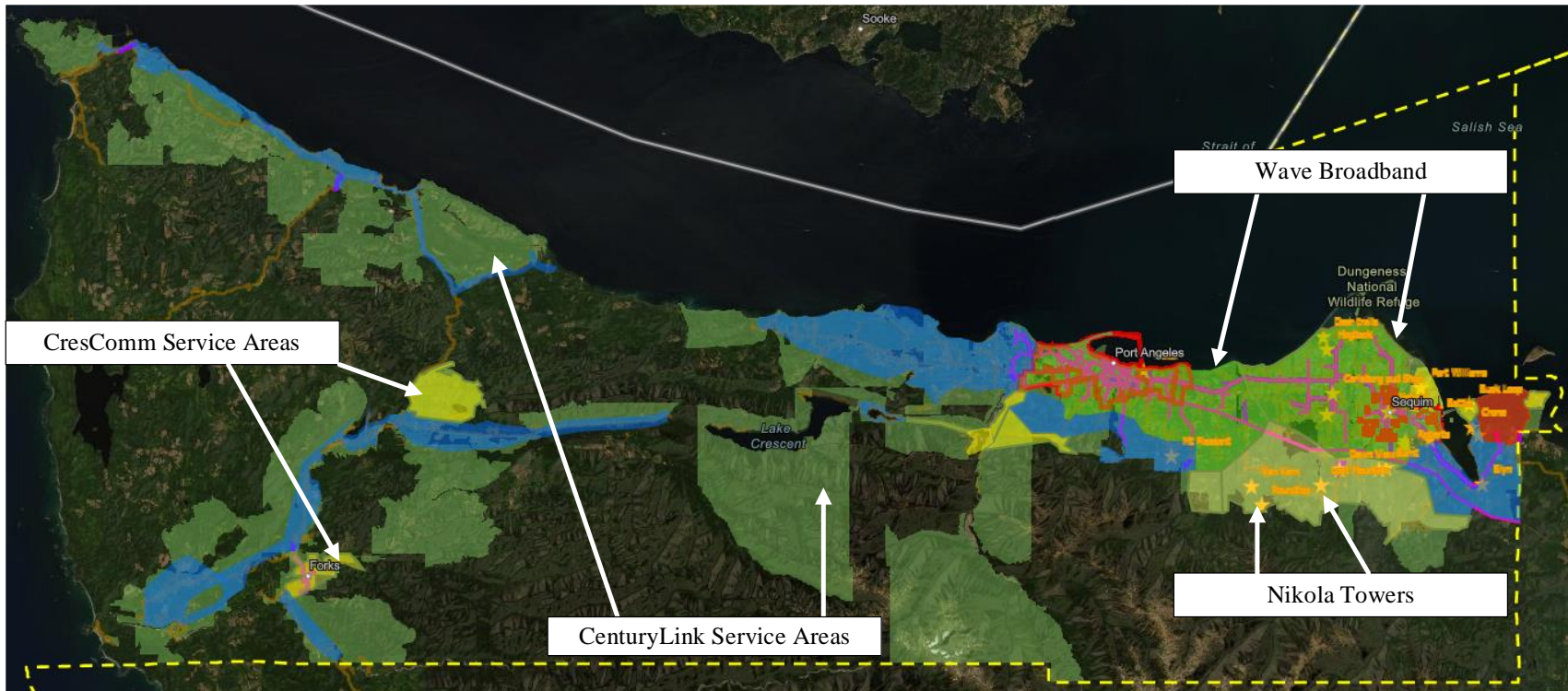
PUD fiber optic cables.



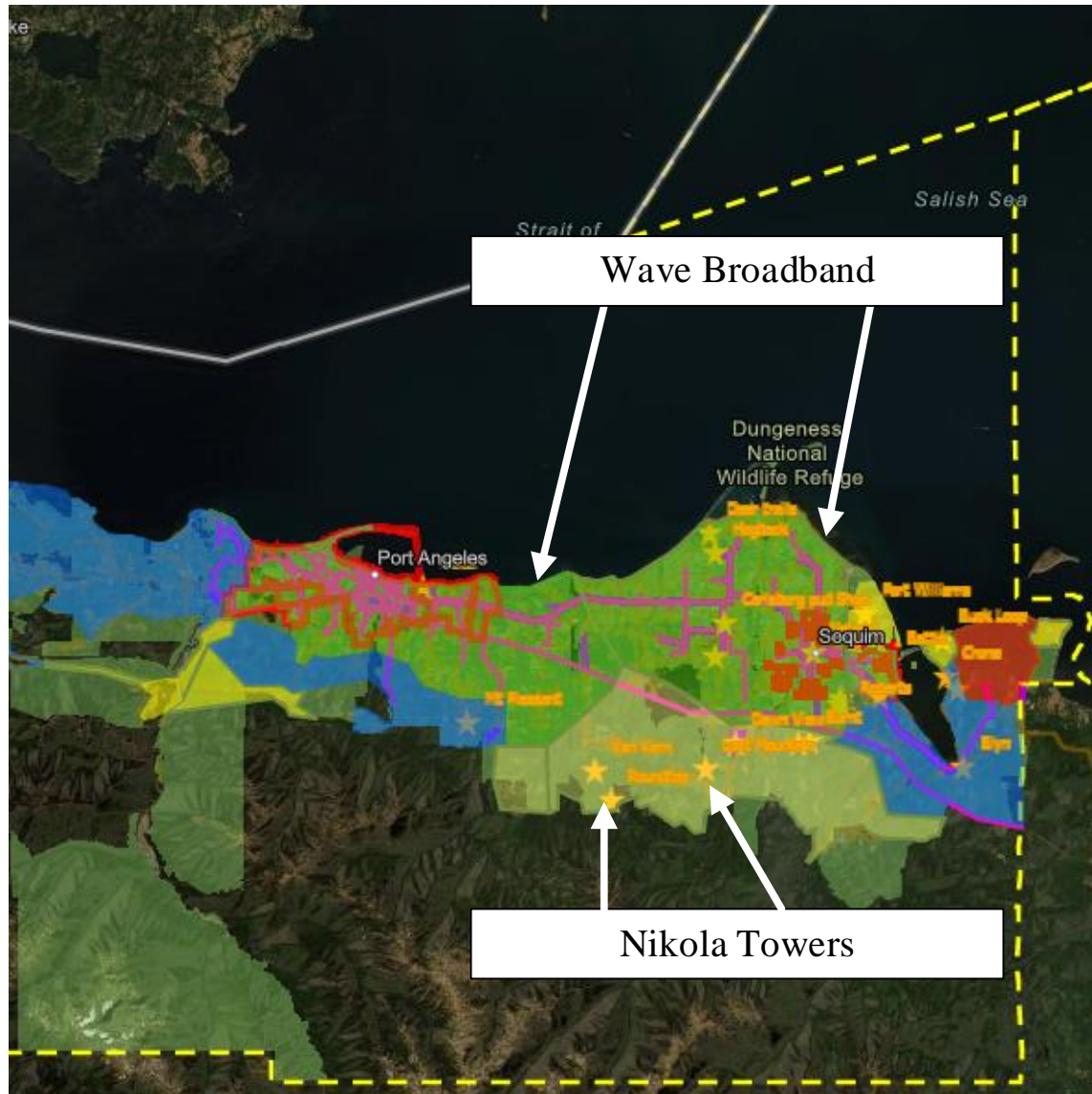
PUD fiber optic cables on the western end of the County.



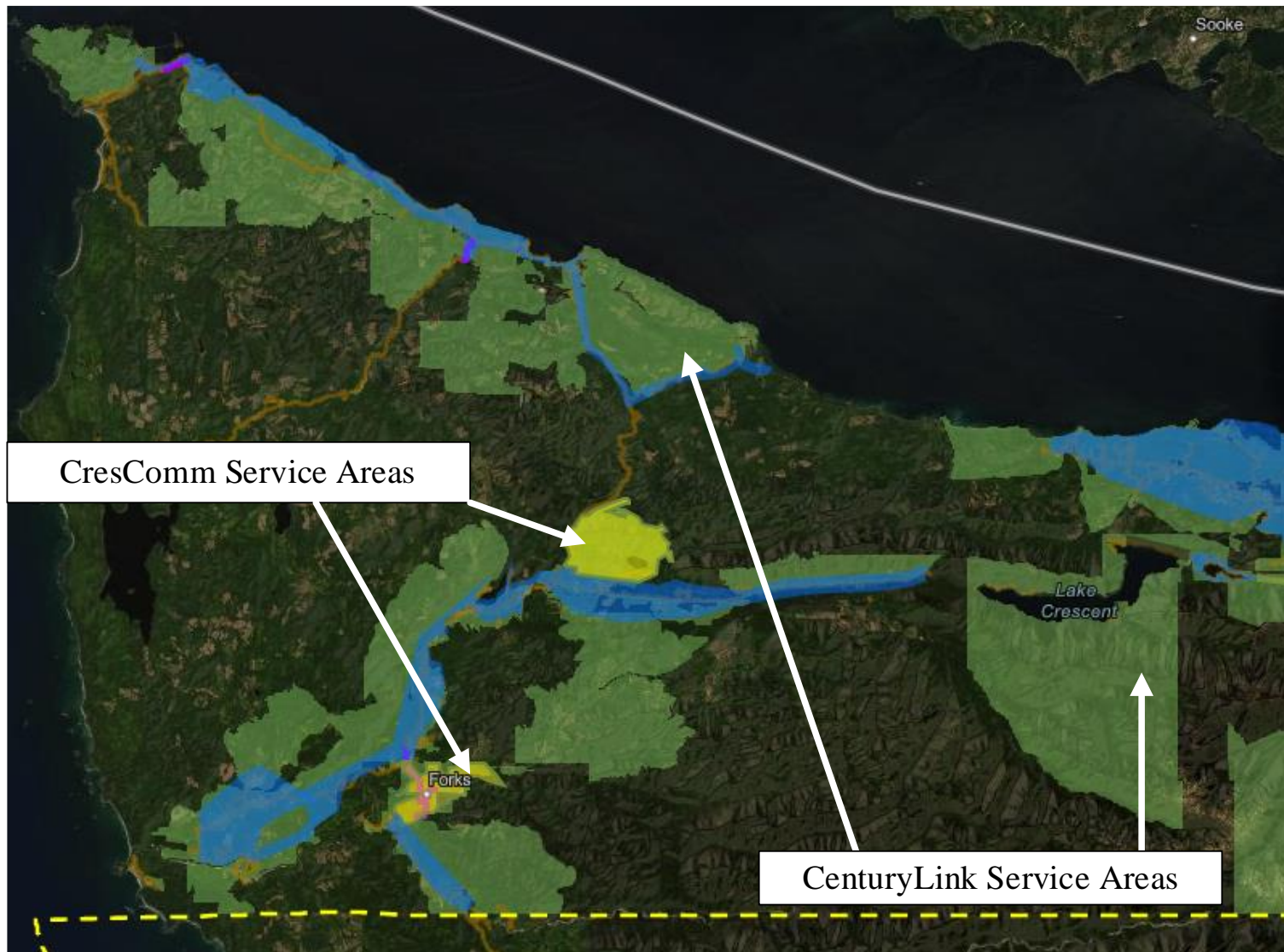
PUD Poles (red poles creating lines) throughout Clallam County.



Providers' known coverage in Clallam County



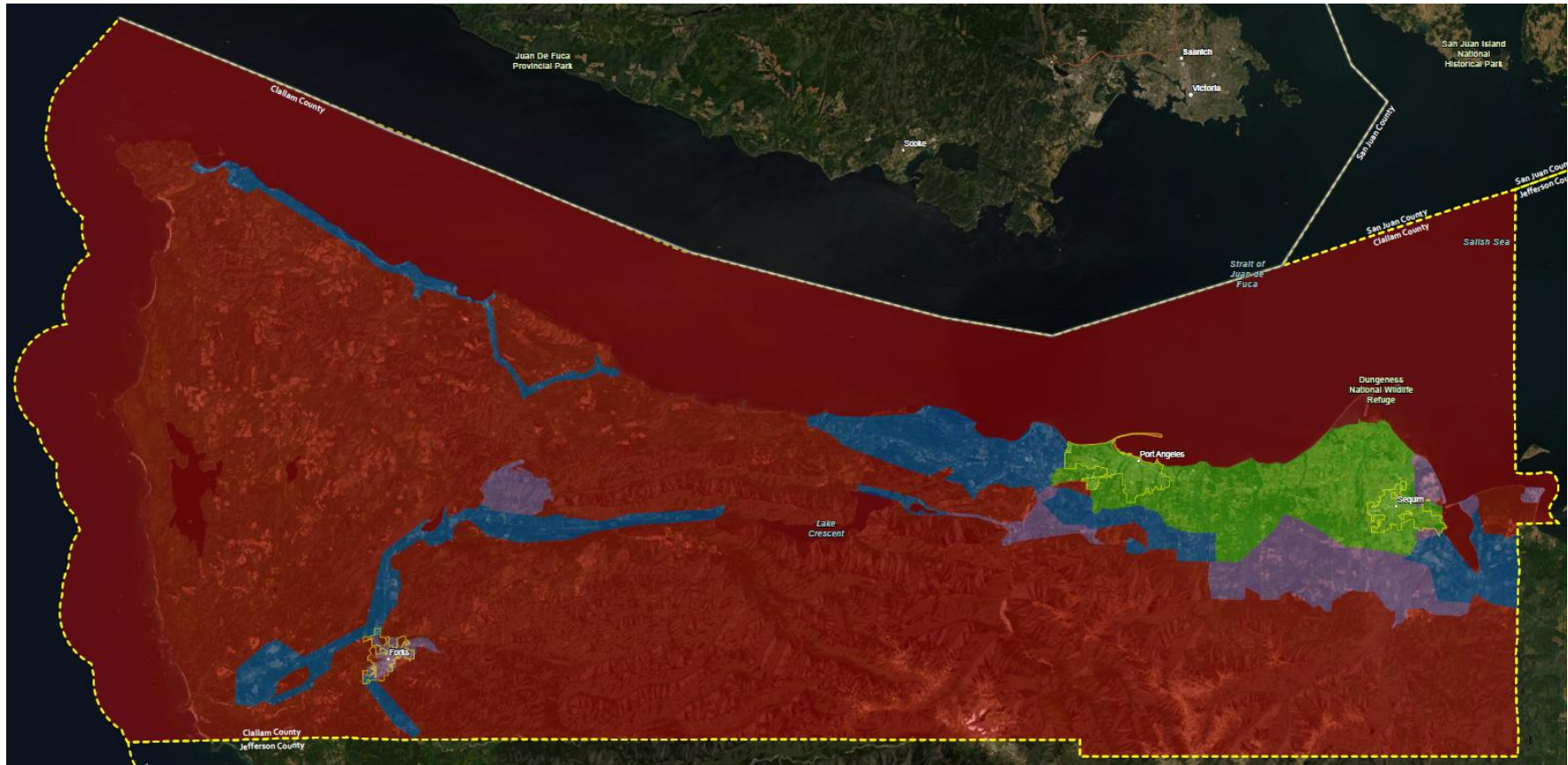
Coverage in eastern side of Clallam County



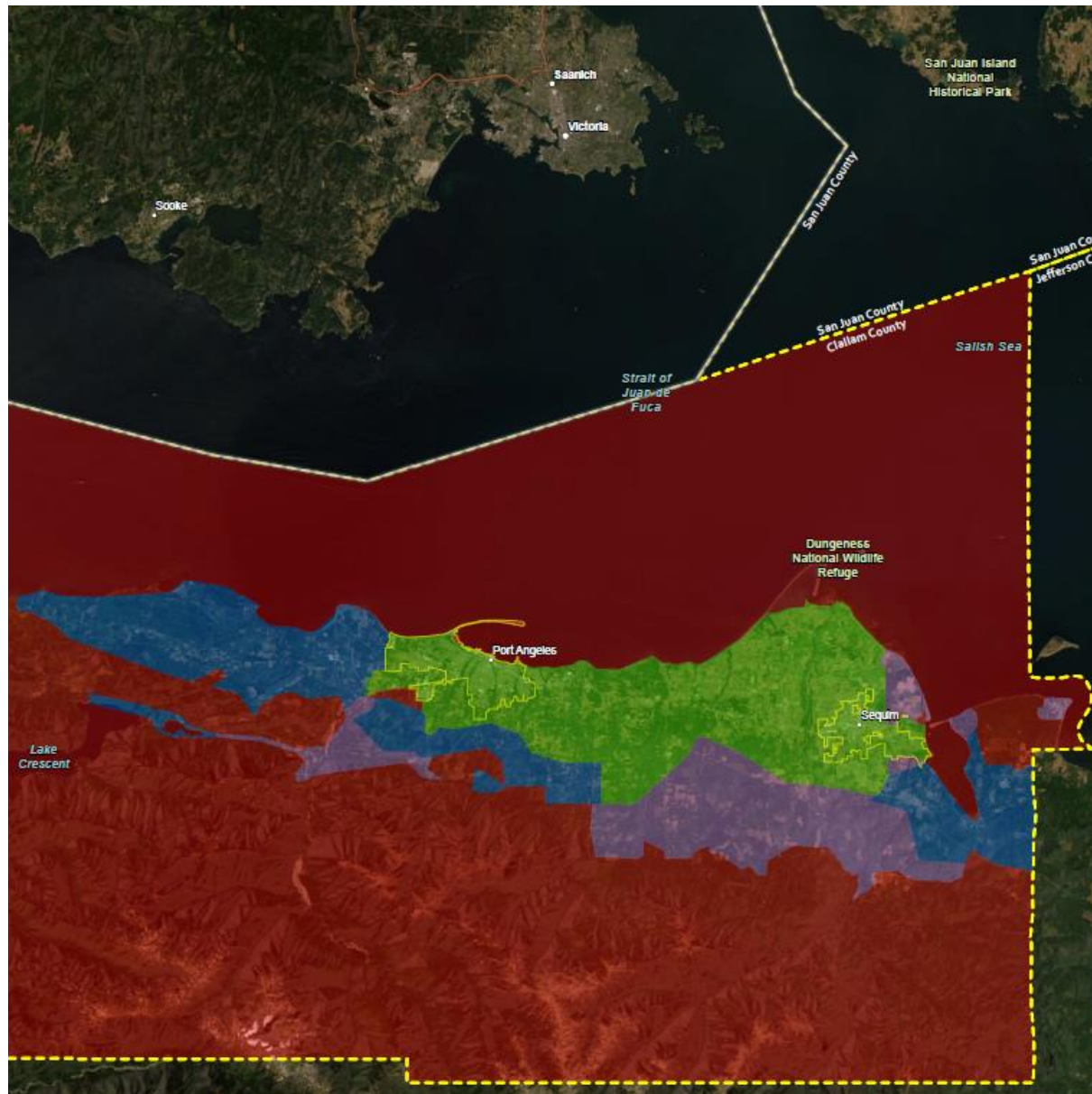
Coverage in western and central areas of Clallam County

EXHIBIT I – Broadband Gap Maps

EXHIBIT I – Broadband Gap Maps



Green areas have Broadband availability.
Blue areas have non-Broadband Internet availability.
Purple areas have spotty Broadband availability mixed with non-Broadband Internet availability.
The Red areas have no Internet availability, except potentially for dial-up, satellite, and cellular.
All Red, Blue and Purple areas represent gaps in Broadband availability.



Eastern Clallam County



Western Clallam County

EXHIBIT J – Broadband Authority Pro-Forma

EXHIBIT J – Broadband Authority Pro-Forma

Pro-Forma

Name - CCBA Management
Time Period - 5 Years

Financial Statements in U.S. Dollars

Revenue

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Member Contributions	\$120,000.00	\$120,000.00	\$94,500.00	\$66,150.00	\$34,729.00
Grant Funds			\$15,750.00	\$33,075.00	\$34,729.00
Provider Revenues			\$15,750.00	\$33,075.00	\$69,457.00
Loans			\$ -		
Less: Funding/Fees	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$120,000.00	\$120,000.00	\$126,000.00	\$132,300.00	\$138,915.00

Gross Profit (Loss)

	\$120,000.00	\$120,000.00	\$126,000.00	\$132,300.00	\$138,915.00
--	--------------	--------------	--------------	--------------	--------------

Expenses

Advertising/Promotion/Outreach	*	*	*	*	*
Contract Labor	**	**	**	**	**
Dues and Subscriptions	*	*	*	*	*
Employee Benefit Programs	\$ 30,000.00	\$ 30,000.00	\$31,500.00	\$33,075.00	\$34,729.00
Insurance	*	*	*	*	*
Legal and Professional Fees	*	*	*	*	*
Licenses and Fees	*	*	*	*	*
Miscellaneous	\$ 15,000.00	\$ 15,000.00	\$15,750.00	\$16,538.00	\$17,364.00
Office Expense	*	*	*	*	*
Payroll Taxes	*	*	*	*	*
Postage	*	*	*	*	*
Rent	*	*	*	*	*
Supplies	*	*	*	*	*
Telephone/Internet	*	*	*	*	*
Travel	*	*	*	*	*
Utilities	*	*	*	*	*
Vehicle Expenses	*	*	*	*	*
Wages	\$ 75,000.00	\$ 75,000.00	\$78,750.00	\$82,687.00	\$86,822.00
Total Expenses	\$120,000.00	\$120,000.00	\$126,000.00	\$132,300.00	\$138,915.00

Net Operating Income

	\$ -	\$ -	\$ -	\$ -	\$ -
--	------	------	------	------	------

Other Income

Gain (Loss) on Sale of Assets					
Interest Income					
Total Other Income	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Net Income (Loss)

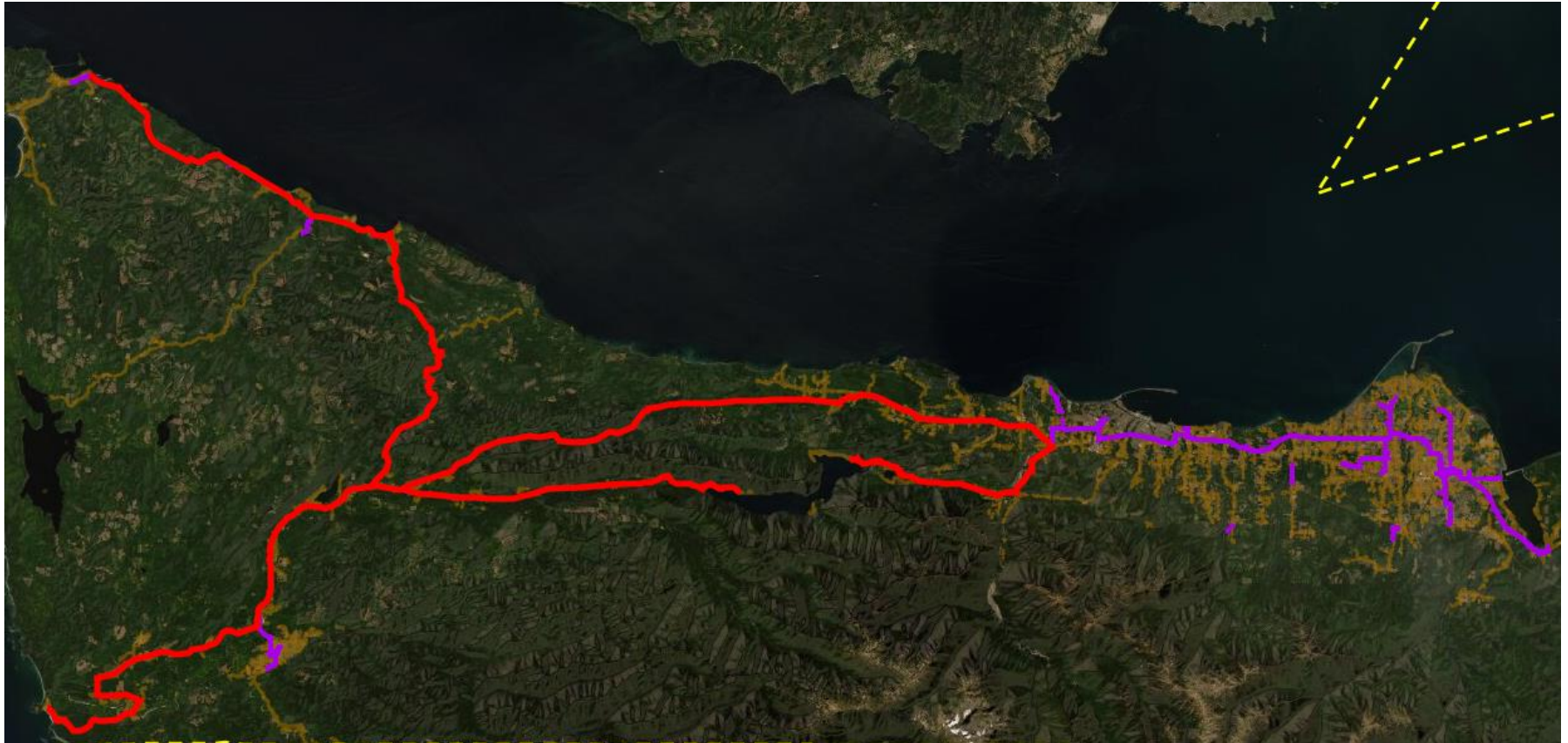
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
--	--------	--------	--------	--------	--------

* Many Expenses can be handled as "In-Kind" contributions. The total cost, if not handled in-kind for such expenses is projected at \$15,000 for the first and second years (accounted for in the Miscellaneous field).

** Authority management could be contracted out, but it is unlikely, for \$120,000, that a person year (2080 task hours) could be achieved, unless the task responsibilities were parceled out to multiple contracted employees.

EXHIBIT K – Middle Mile Build Scenario

EXHIBIT K – Middle Mile Build Scenario



Purple is the PUD’s existing fiber optic infrastructure; red is the proposed expansion of the network as a middle mile expansion.

Expansion of the PUD's Existing Network to add Middle Mile Fiber Optic Infrastructure

		Miles	Cost per Mile	
New Underground Fiber	45%	69.75	\$5,580,000	\$80,000
New Aerial Fiber	55%	85.25	\$4,262,500	\$50,000
New Fiber Optic Cable Estimate		155		
Total Estimated Cost			\$9,842,500	

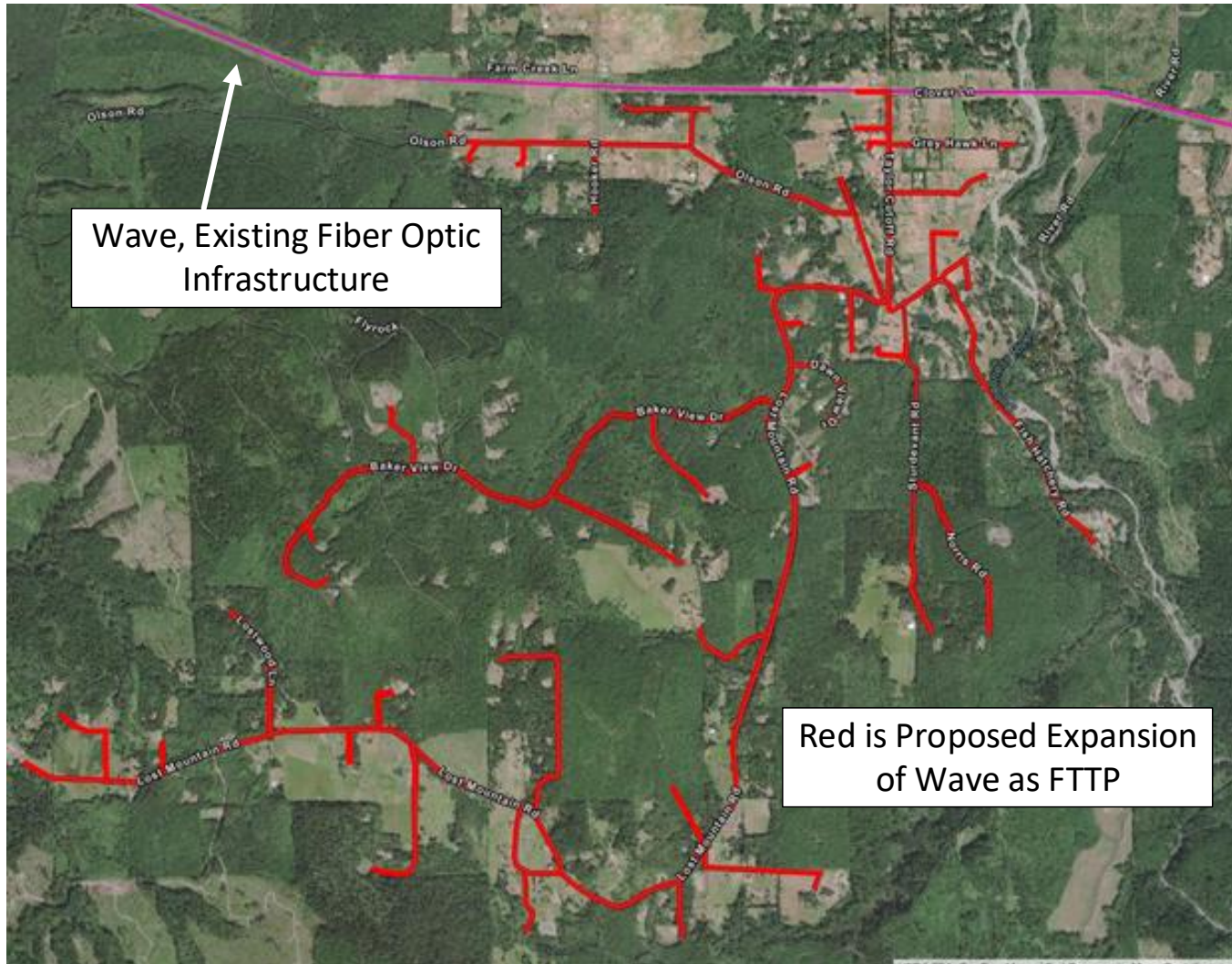
Expansion of the PUD's Existing Network to add Middle Mile Fiber Optic Infrastructure

New Fiber Optic Cable Estimate	155
Total Estimated Infrastructure Cost	\$9,842,500
Estimated Total Capital Expenditure	\$9,842,500
Annualized over 5 years @ 4% interest	Per Year \$2,167,956
Requires an average of 7,227 subscribers at \$300 per year	(\$2,168,100)
Balance sheet, end of year	\$144
Average per year over five years:	
*50% Grant	(\$1,083,978)
After 50% Grant, Requires 3,614 subscribers at \$300 per year	(\$1,084,200)
Balance sheet, end of year	\$222
Annualized over 7 years @ 4% interest	Per Year \$1,609,068
Requires 5,364 subscribers at \$300 per year	\$1,609,200
Balance sheet, end of year	\$132
Average per year over seven years:	
*50% Grant	(\$804,534)
After 50% Grant, Requires 2,682 subscribers at \$300 per year	(\$804,600)
Balance sheet, end of year	\$66

- Many grants require less than a 50% match. Some require as low as 10% Grantee funds, which would substantially decrease the Middle Mile provider contribution and payback period.

EXHIBIT L – Wave FTTP Expansion Scenario

EXHIBIT L – Wave FTTP Expansion Scenario



Expansion of Wave Fiber Optic Infrastructure – Sample Map Area

		Miles		Cost per Mile
New Underground Fiber	30%	8.19	\$696,150	\$85,000
New Aerial Fiber	70%	19.11	\$573,300	\$30,000
New Fiber Optic Cable Estimate		27.3		
Total Estimated Cost			\$1,269,450	
Total Homes		323		
Homes Per Mile of New Plant		11.83		
Estimated Cost per Home Passed			\$3,930.19	

Expansion of Wave Fiber Optic Infrastructure – East/Part of Central Clallam County

		Miles		Cost per Mile
New Underground Fiber	30%	82.5	\$7,012,500	\$85,000
New Aerial Fiber	70%	247.5	\$7,425,000	\$30,000
New Fiber Optic Cable Estimate		330		
Total Estimated Cost			\$14,437,500	
Total Homes		3270		
Homes Per Mile of New Plant		9.91		
Estimated Cost per Home Passed			\$4,415.14	

EXHIBIT M – Public-Private FTTP Build Scenario

EXHIBIT M – Public-Private FTTP Build Scenario

Public/Private Partnership FTTP Build Scenario

(Expanded Middle Mile in Place)

		Miles	Total Costs	Cost per Mile
New Underground Fiber	60%	930	\$74,400,000	\$80,000
New Aerial Fiber	40%	620	\$31,000,000	\$50,000
New Fiber Optic Cable Estimate		1,550		
Total Estimated Cost			\$105,400,000	
Total Homes		35,000		
Homes Per Mile of New Plant		22.58		
Estimated Cost per Home Passed			\$3,012	

3 Year Build

		7 Year Loans	10 Year Loans
Total Estimated Costs		\$105,400,000	\$105,400,000
50% Grant		\$52,700,000	\$52,700,000
Matching Funds		\$52,700,000	\$52,700,000
Year 1 Build	30%	\$15,810,000	\$15,810,000
Year 2 Build	40%	\$21,080,000	\$21,080,000
Year 3 Build	30%	\$15,810,000	\$15,810,000
Total Build	100%	\$52,700,000	\$52,700,000

Loan for Year 1 Costs @ 4%:			
Paid Years 1-7, Per Year:		-\$2,584,644	
Paid Years 1-10, Per Year:			-\$1,914,456
Loan for Year 2 Costs @ 4%:			
Paid Years 2-8, Per Year:		-\$3,446,184	
Paid Years 2-11, Per Year:			-\$2,552,592
Loan for Year 3 Costs @ 4%:			
Paid Years 3-9, Per Year:		-\$2,584,644	
Paid Years 3-12, Per Year:			-\$1,914,456
Customer Revenue per Year		\$800	\$800
<hr/>			
Year 1 Loan Payments		(\$2,584,644)	(\$1,914,456)
Year 1 Total Debt		(\$2,584,644)	(\$1,914,456)
Customers per Year (@\$800)	800	\$640,000	\$640,000
Year 1 Balance		(\$1,944,644)	(\$1,274,456)
<hr/>			
Year 2 Loan Payments		(\$6,030,828)	(\$4,467,048)
Year 2 Total Debt		(\$7,975,472)	(\$5,741,504)
Customers per Year (@\$800)	3,850	\$3,080,000	\$3,080,000
Year 2 Balance		(\$4,895,472)	(\$2,661,504)
<hr/>			
Year 3 Loan Payments		(\$8,615,472)	(\$6,381,504)
Year 3 Total Debt		(\$13,510,944)	(\$9,043,008)
Customers per Year (@\$800)	7,750	\$6,200,000	\$6,200,000
Year 3 Balance		(\$7,310,944)	(\$2,843,008)
<hr/>			
Year 4 Loan Payments		(\$8,615,472)	(\$6,381,504)
Year 4 Total Debt		(\$15,926,416)	(\$9,224,512)
Customers per Year (@\$800)	8,400	\$6,720,000	\$6,720,000
Year 4 Balance		(\$9,206,416)	(\$2,504,512)
<hr/>			
Year 5 Loan Payments		(\$8,615,472)	(\$6,381,504)
Year 5 Total Debt		(\$17,821,888)	(\$8,886,016)
Customers per Year (@\$800)	8,650	\$6,920,000	\$6,920,000
Year 5 Balance		(\$10,901,888)	(\$1,966,016)
<hr/>			
Year 6 Loan Payments		(\$8,615,472)	(\$6,381,504)
Year 6 Total Debt		(\$19,517,360)	(\$8,347,520)
Customers per Year (@\$800)	8,900	\$7,120,000	\$7,120,000
Year 6 Balance		(\$12,397,360)	(\$1,227,520)

Year 7 Loan Payments		(\$8,615,472)	(\$6,381,504)
Year 7 Total Debt		(\$21,012,832)	(\$7,609,024)
Customers per Year (@\$800)	9,100	\$7,280,000	\$7,280,000
Year 7 Balance		(\$13,732,832)	(\$329,024)
Year 8 Loan Payments		(\$6,030,828)	(\$6,381,504)
Year 8 Total Debt		(\$19,763,660)	(\$6,710,528)
Customers per Year (@\$800)	9,250	\$7,400,000	\$7,400,000
Year 8 Balance		(\$12,363,660)	\$689,472
Year 9 Loan Payments		(\$2,584,644)	(\$6,381,504)
Year 9 Total Debt		(\$14,948,304)	(\$5,692,032)
Customers per Year (@\$800)	9,350	\$7,480,000	\$7,480,000
Year 9 Balance		(\$7,468,304)	\$1,787,968
Year 10 Loan Payments		\$0	(\$6,381,504)
Year 10 Total Debt		(\$7,468,304)	(\$4,593,536)
Customers per Year (@\$800)	9,400	\$7,520,000	\$7,520,000
Year 10 Balance		\$51,696	\$2,926,464
Year 11 Loan Payments		\$0	(\$4,467,048)
Year 11 Total Debt		\$51,696	(\$1,540,584)
Customers per Year (@\$800)	9,450	\$7,560,000	\$7,560,000
Year 11 Balance		\$7,611,696	\$6,019,416
Year 12 Loan Payments		\$0	(\$1,914,456)
Year 12 Total Debt		\$7,611,696	\$4,104,960
Customers per Year (@\$800)	9,500	\$7,600,000	\$7,600,000
Year 12 Balance		\$15,211,696	\$11,704,960
Total Payments:		(\$60,308,304)	(\$63,815,040)

EXHIBIT N – List of Possible Grant Opportunities

EXHIBIT N – List of Possible Grant Opportunities

Coronavirus State Fiscal Recovery Fund - \$219.8 Billion from the American Rescue Plan (ARP) is provided to the States for investments in water, sewer and broadband infrastructure. The Team (or Authority) would need to advocate at the State level to determine how that funding is distributed.

Coronavirus Local Fiscal Recovery Fund - \$130.2 Billion is provided for: Rural Community Development Block Grants (CDBG) (\$45.6 billion of the total); rural areas (\$19.5 billion of the total), and counties (\$65.1 billion of the total, based on population). This funding is targeted at investments in water, sewer and broadband infrastructure. The CDBG grants will be administered by the Federal Housing and Urban Development Agency.

Department of Commerce, Economic Development Administration (EDA) - \$3 Billion from ARP has been added to the existing funding through September 2022, for public works and economic adjustment assistance (PWEAA) program grants.

Federal Communications Commission (FCC) Emergency Broadband Benefit Program – \$3.2 Billion is being provided for eligible low-income households to receive a discount on the cost of Broadband service and certain connected devices. Participating providers in the program receive a reimbursement for such discounts. Certain rules are still being established, but the FCC and the Universal Service Administrative Company (USAC) are working together to administer the grants.

Federal Communications Commission (FCC) Emergency Connectivity Fund - \$7.2 Billion in E-rate support from ARP will be provided to reimburse schools and libraries for the provision of eligible equipment and advanced telecommunications and information services during the pandemic.

Federal Communications Commission Rural Digital Opportunity Fund Phase II – the FCC has substantial funds available for a 2nd Phase of a RDOF reverse auction, although the lion's share of qualifying rural census blocks were already awarded. However, a number of providers and States have protested that many of the rural blocks are not planned to be completely built out by the awardees. As the post auction audit and certification work needs to be completed prior to a new round, it is likely that Phase II won't occur until 2022.

The Local Assistance and Tribal Consistency Fund – \$250 Million per year from ARP in 2022 and 2023 is focused on tribal use only for governmental purposes other than lobbying.

National Telecommunications and Information Administration (NTIA) – The Promote Broadband Expansion Grant Program has \$300 Million designed to develop broadband infrastructure, with the focus on Public-Private Partnerships and Rural Project proposals.

US Department of Agriculture (USDA) – ReConnect Program - \$600 Million in grant and loan funds were available during the last round of the Reconnect Program Awards. A new round is expected in the next fiscal year.

US Department of the Treasury Coronavirus Capital Projects Fund - \$10 Billion from ARP has been slated for capital projects directly enabling work, education and health monitoring, including remote options, in response to the public health emergency. Ancillary services such as broadband mapping to increase the efficiencies of the capital projects are eligible, as are cost support efforts such as subsidies.

Washington State – CERB – depending on budgetary allocations from the State, additional funds may be available from CERB for specific rural broadband projects.

Washington State – Public Works Board - depending on funding from the State, it is anticipated that there will be a new Broadband Construction Grant and Loan cycle in the next biennium.

Washington State – Potential for Public-Private Partnership Grants – it will be important for the Team (or Authority) to advocate at the State level to develop Grant programs which provide matching funds from the State to eligible local governments and their private partners. This would be establishing a Washington State Grant Program similar to those such as the Virginia Telecommunications Initiative Grant Program.

This list should be updated regularly as Federal and State funding opportunities continue to be developed.

EXHIBIT O - Bibliography

EXHIBIT O - Bibliography

1. Arnold, Jordan & Sallet, Jonathan. “If We Build It, Will They Come? Lessons from Open-Access, Middle-Mile Networks”, Benton Institute for Broadband & Society, December 2020.
2. Britt, Phil. “Louisiana’s LUS Fiber Receives \$3.1 Million EDA Grant from USDA”, Telecompetitor.com, <https://www.telecompetitor.com/louisianas-lus-fiber-receives-3-1-million-eda-grant-from-usda/>, February 26, 2021.
3. Eastern Shore of Virginia Broadband Authority (ESVBA). <https://esvba.com/>
4. Eggman, Phil. “USDA Invests \$2.4 Million in Broadband for Rural Washington Communities”, U.S. Department of Agriculture, <https://www.usda.gov/media/press-releases/2020/01/29/usda-invests-24-million-broadband-rural-washington-communities>, 1/29/2020.
5. Engebretson, Joan. “With RDOF Support, Charter Commits \$5 Billion for Rural Expansion”, February 1, 2021. <https://www.telecompetitor.com/with-rdof-support-charter-commits-5-billion-for-rural-broadband-expansion/>
6. Federal Communications Commission. “Rural Digital Opportunity Fund Phase 1 Results”, <https://www.fcc.gov/reports-research/maps/rdof-phase-i-dec-2020/>, 12/07/2020.
7. Friedenberger, Amy. “Pandemic highlighted urgency to get Virginian’s broadband, and the General Assembly is investing”, Roanoke VA Times, https://roanoke.com/news/pandemic-highlighted-urgency-to-get-virginians-broadband-and-the-general-assembly-is-investing/article_4fad66ba-7264-11eb-ae0e-ebfbefa95adc.html, February 20, 2021.
8. Glasgow Electric Plant Board; Internet and Data Services – GlasgowEPB.net. Glasgow Electric Plan Board, https://www.glasgowepb.net/?page_id=13/
9. Gonsalves, Sean. “Potatoes and Fiber Aplenty in Grant County, Washington”, muninetworks.org, https://muninetworks.org/content/potatoes-and-fiber-aplenty-grant-county-washington?mc_cid=a571a264bc&mc_eid=7b56ec6425/, March 4, 2021.
10. Grays Harbor PUD Telecommunications. “Investing in Technology for the Benefit of our Customers and Community”, www.ghpud.org/telecom-home/
11. Marek, Sue. “Utopia Fiber gets \$52.5 M in funding to expand its network”, Fierce Telecom., <https://www.fiercetelecom.com/telecom/utopia-fiber-gets-52-5m-funding-to-expand-its-network>
12. Port of Whitman County | Petrichor Broadband. <https://www.portwhitman.com/petrichor/>

13. Rice, Julie Steinkopf. "From Timber to Technology: A Community's Efforts to Bridge the Digital Divide", Dept. of Community and Rural Sociology Washington State University Pullman, WA, 2004.
14. Washington State Broadband Office, "A Broadband Roadmap for Rural & Tribal Communities of the Western Olympic Peninsula", Washington State University, Clallam & Jefferson County Extension & North Olympic Peninsula Resource Conservation & Development, June 2014.

EXHIBIT P - Glossary

EXHIBIT P – Glossary

ADSL – Asymmetric Digital Subscriber Line – A DSL network that provides higher bandwidth in the forward direction than it does in the return direction.

BATs – Broadband Action Teams – Comprised of local stakeholders who meet regularly to identify challenges and opportunities and then develop strategies to overcome the challenges and leverage the opportunities. BATs can work on availability and deployment strategies, adoption and literacy issues, etc.

Broadband – Internet service that provides minimums of 3 Mbps in the upstream or return direction and 25 Mbps in the downstream or forward direction.

CERB – Community Economic Revitalization Board – Established in 1982 to respond to local economic development in Washington communities. CERB provided funding and specifications/requirements for this Project.

CBRS – Citizens Band Radio Service – Wireless communication network using frequencies in the CB radio band (3.5 GHz). The Spectrum is being adapted for use by fixed wireless providers.

Clallam County Broadband Authority (CCBA)– A proposed group of members representing the various jurisdictions and stakeholders in the County with a goal of taking advantage of synergies, knowledge and resources to promote and coordinate expansion of Broadband throughout the County.

DSL – Digital Subscriber Line – Use of higher frequencies on regular, traditional, telephone lines to transport data.

DSLAM – Digital Subscriber Line Access Multiplexer – A Telephone Company’s device that connects multiple DSL customers’ copper lines to the company’s network via fiber optic cables.

FCC – Federal Communications Commission – Federal Agency that regulates communications via radio, TV, satellite and cables/fibers, in the United States.

Form 477 – FCC Requirement for reporting and documentation requiring all facilities-based broadband providers to list their technology employed and advertised speeds for each Census Block served by the provider. (Note: service must be available to one or more addresses in the Census Block to be considered served)

FPON – Fiber Passive Optical Network – A fiber optic network that has no active components across the network’s path, i.e., no amplification takes place after leaving the transmitter.

FTTH – Fiber to the Home, also FTTP or Fiber to the Premises – A network constructed of fiber optic infrastructure all the way to homes, businesses, Anchors, etc.

Gbps – Gigabits per second – A measurement of Internet Bandwidth (speed or transfer rate). 1 billion bits transported per second. (1,000 Mbps)

Giga hertz (GHz) – A unit of frequency. One billion Hertz. In Networking it is used to describe the frequency of a wireless link. i.e. 60 GHz wireless network.

GPON – Gigabit Passive Optical Network – Passive optical point to multipoint network that provides 2.4 Gbps down and 1.244 Gbps upstream to each ONU or optical network unit.

Mbps – Megabits per second – A measurement of Internet Bandwidth (speed or transfer rate). 1 million bits transported per second.

Millimeter Wave – Represents a frequency range of extremely high frequencies (EHF) such as 30 GHz or 300 GHz used in wireless networks such as 5G cellular networks. The high frequency limits the range or distance the signal travels.

PDA – Public Development Authority – Government owned corporation operating separate from the City or County government. These Authorities are developed to focus on specific purposes within specific geographic areas.

Propagation – (Wave Propagation) – Although complex, propagation simply put is the pattern and distance a wireless signal will travel. This can be best envisioned as a wireless network's footprint or coverage area.

Public Utility District – Not-for-profit community-owned utilities. PUD's provide electric, water and sewer and wholesale telecommunications services.

RDOF – Rural Digital Opportunity Fund – A Federal fund set up to expand Broadband into areas of the Country that are not served with Broadband or that are underserved. \$20.4 billion was put into the Fund for reverse auctions where providers bid to provide Broadband with financial incentive for each location made serviceable by expansion or creation of a Broadband Network.

Team – Clallam County Broadband Team – A team comprised of representatives of all jurisdictions in the County as well and educational entities, Libraries, economic development, Port, PUD and other entities to develop an understanding of where Broadband is not available in the County, the reasons for this and to develop some potential scenarios to overcome Broadband deficiencies in Clallam County.

xDSL – Overarching, all-inclusive term used to include the many variations of DSL. xDSL is also used to include future, yet unproven or deployed versions of DSL that are said to provide much faster speeds than available via DSL today.