Council Business Meeting

Date April 3, 2023

Agenda Item	Ashland Fiber Network (AFN) - Business and Technology Planning Presentation	
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SUMMARY

The Ashland Fiber Network (AFN) provides tremendous value to the City of Ashland. Taxpayers, local businesses, and municipalities throughout the Rogue Valley benefit from our presence. We are a viable alternative to Spectrum and CenturyLink, excel at customer service, and provide significant cost savings to the taxpayers, the City of Ashland, and local businesses.

AFN is a hybrid fiber-coax (HFC) network. Fiber is connected to each of our 38 cable modem nodes. At the node, the fiber is converted to coax which is run to every customer. We currently have 65 miles of fiber and over 125 miles of coax.

Three options for the future of AFN

1. Self-funded full deployment (current model)
2. Non-traditional Public-Private Partnership (network still owned and maintained by the City)
3. Traditional Public-Private Partnership (network owned and maintained by our private partner)

Option 1: Obtain funding to deploy fiber city-wide

This option presents the most risk to the City and also the most reward. For a timely deployment, we will need to hire a third-party company to build the network. We believe it will take 3 to 4 years to connect every building in Ashland to the new all-fiber network at a cost of $8 to $10 million.

To help mitigate the risk, we recommend a pilot project first. We will need to bring on temporary staff provided by the union hall to assist with construction. We will connect a maximum of 1024 homes and businesses through four remote OLTs. We anticipate this project will cost between $885,000 and $1 million and will take 2 years to complete. The four remote OLTs will be deployed in a wide variety of neighborhoods. This pilot project will allow us to better estimate take rates and build public support for a widespread deployment.

	Vendor 1	Vendor 2
OLT/ONT	$259,040	$188,698
Residential Router	$259,040	$188,698
Fiber	$208,000	$208,000
Labor	$300,000	$300,000
Total	$1,026,080	$885,396

This table shows pricing from two vendors for the active electronics. The four OLTs will be deployed in the field and the ONTs will be installed at each customer location.

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Option 2: Non-traditional Public-Private Partnership

A typical Public-Private Partnership (P3) involves the private company financing, building, and operating a fiber network. Since the City has the staff and experience operating a broadband network, we will likely partner with a private company to assist with financing and building the fiber network. In this approach, the private company will be responsible for designing the fiber layout, purchasing all outside plant materials (fiber, splice cases, optical splitters, etc.), and providing the labor. The City will be responsible for purchasing the active electronics (OLT/ONT). We will continue to operate and maintain the network once it is built. In this option, the city will continue to own the customer revenue base.

It will be difficult to find a private partner who is willing to enter this type of business relationship. Most fiber construction companies are busy building out their own networks, especially with the federal government grants for rural broadband.

In the following table we have provided two examples of how the financial arrangement might be structured. In both scenarios, the City will pay a yearly fee and a per customer fee for 10 years to the private partner.

	Vendor 1		Vendor 2	
OLT/ONT	$2,660,000		$1,850,000	
Residential Router	$804,000		$636,000	
City Total	$3,464,000		$2,486,000	
Supplies	$2,000,000	$4,000,000	$2,000,000	$4,000,000
Labor	$2,000,000	$3,000,000	$2,000,000	$3,000,000
Private Partner Total	$4,000,000	$7,000,000	$4,000,000	$7,000,000
Grand Total	$7,464,000	$10,464,000	$6,486,000	$9,486,000

This table shows the cost estimate for a non-traditional P3. The top section in green shows the cost to the city. The bottom section in orange shows the potential cost to our private partner.

The following two tables provide cost estimates and payout schedules.

	Annual Payment	Customer Count	Payment per Customer	Yearly Payment Total
Year 1	$250,000	2000	$5	$120,000
Year 2	$250,000	2000	$5	$240,000
Year 3	$250,000	2000	$5	$360,000
Year 4	$250,000	600	$5	$396,000
Year 5	$250,000	400	$5	$420,000
Year 6	$250,000	200	$5	$432,000
Year 7	$250,000	200	$5	$444,000
Year 8	$250,000	200	$5	$456,000
Year 9	$250,000	200	$5	$468,000
Year 10	$250,000	200	$5	$480,000
Totals	$2,500,000	8000		$3,816,000
			Grand Total	$6,316,000

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	Annual Payment	Customer Count	Payment per Customer	Yearly Payment Total
Year 1	$250,000	2000	$10	$240,000
Year 2	$250,000	2000	$10	$480,000
Year 3	$250,000	2000	$10	$720,000
Year 4	$250,000	600	$10	$792,000
Year 5	$250,000	400	$10	$840,000
Year 6	$250,000	200	$5	$744,000
Year 7	$250,000	200	$5	$648,000
Year 8	$250,000	200	$5	$552,000
Year 9	$250,000	200	$5	$540,000
Year 10	$250,000	200	$5	$540,000
Totals	$2,500,000	8000		$6,096,000
			Grand Total	$8,596,000

These tables show two potential profit-sharing models.

Option 3: Traditional Public-Private Partnership

This option presents the least risk to our private partner and the most risk to the city. This option represents a typical Public-Private Partnership (P3). Cities who enter a P3 typically receive money through franchise agreements. Most franchise agreements are for 7% of gross revenue minus the cost of any services provided to the municipality. Conservatively, the net value AFN provides the city is $767,770 (refer to the table on page 6 for details). Assuming the private partner has a typical franchise agreement, they will need to gross nearly $11 million dollars (7% of $11 million is $770,000). A private partner may also value fiber services at a higher rate (which is standard in the Rogue Valley). AFN currently grosses $2.7 million.

This is the text from Central Point's franchise agreement with Hunter. AFN has a similar arrangement with the City of Medford.

> *Grantee shall make its telecommunications services available to the City at its most favorable rate offered at the time of the request charged to a similar user within Oregon for a similar volume of service, subject to any of Grantee's tariffs or price lists on file with the Oregon Public Utilities Commission.* **Grantee may deduct the applicable charges from franchise fee payments.** *Other terms and conditions of such services may be specified in a separate agreement between the City and Grantee.*

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POLICIES, PLANS & GOALS SUPPORTED

AFN is unique because it is one of the few municipally owned and operated service providers in the nation. It is extremely rare to find an internet service provider that has a fiduciary responsibility to their customers. We also have an incredible team that provides superior technical support.

Digital equity and inclusion are a top priority. During the pandemic, we offered free internet service for students and teachers until classes returned to in-person learning. We believe that all citizens are entitled to high quality internet service. This summer we started a pilot program using technology to provide fiber services to apartment complexes. We connected Snowberry Phases I and II (Jackson County Housing Authority) to this service. We offer reduced internet service to those in need ($25/month). That price will not increase when we deploy fiber. We also offer free wireless internet connections throughout the downtown corridor.

PREVIOUS COUNCIL ACTION

From its inception, the Ashland Fiber Network was a bold idea, developed by a community of visionary leaders. Ashland became one of Oregon's pioneers in municipal broadband, developed partnerships with local businesses for construction, and spawned several local internet service providers to assist with sales and customer support. Indirectly, AFN was an economic driver for the community that brought many businesses into the area. Symbolically, AFN served as a beacon to forward thinking people who were attracted to Ashland as a location to create clean businesses and perform digital jobs; residents saw a city with vision, committed to its people, and willing to invest in their future.

Today, AFN continues to receive awards and recognition from state and regional organizations for leadership in delivering broadband internet to their local community. AFN was recognized by other state telecom members with an Excellence in Telecommunications Award for 2021. Despite the introduction of legislation in many states to prevent competition by municipally owned networks, at least 177 other cities either own, or are in the process of constructing their own fiber networks. Over its history, Ashland has been hailed as a pioneer on the path to the smart city of the future.

In 2020, the onset of the pandemic highlighted how even residential access to the internet had become critical for both schools and businesses. Because AFN's mission is based on putting community first, they offered an unprecedented, free cable-modem installation and service plan – for over a year – so that no local students or faculty were excluded from at-home learning, during the 2020 peak of the pandemic. When the Almeda Fire temporarily left AFN as the only operational broadband provider in Ashland for a week, AFN demonstrated the value of having a local team dedicated to their community who – even in the event of a statewide or national emergency – has no higher priority than Ashland families, businesses, and government.

This highlights an aspect of AFN that is seldom recognized: From the beginning, the sole objective of municipal broadband has been to serve the community. All of AFN's operational decisions are made in Ashland, for the benefit of the Ashland community. No competitor can make that claim.

This serve-the-community focus is reflected in every operational decision of AFN. While some providers look for opportunities to monetize customer information or online behaviors, AFN strives to provide customers with the fastest, most consistent, and most economical access to the Internet possible, while covering operational costs and paying down infrastructure build-out debt. These are core values the Ashland community should keep in mind, while investigating new to carry AFN into the future.

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BACKGROUND AND ADDITIONAL INFORMATION

Terminology

- **Dark fiber:** Dark fiber is when a service provider leases a dedicated strand or strands of fiber to a customer for their sole use. Dark fiber means the service provider will not "light" the fiber with their equipment. Dark fiber typically costs more than lit service because the service provider must dedicate a single strand to a single customer.
- **Lit service:** Lit service means the service provider supplies the equipment to connect the fiber to the customer, usually through a network switch. Lit service has two options: internet service (also called DIA) and point-to-point (connecting two locations with no internet access). Lit service is often connected to a fiber ring where a single strand serves multiple customers.
- **GPON:** Gigabit Passive Optical Network. Internet technology that uses prisms (Passive) to split the laser light (Optical) to deliver Gigabit internet service to multiple customers. Since the cost is shared among up to 64 customers, profit margins are greater than lit service.
- **XGS-PON:** The latest GPON standard. XGS-PON delivers up to 10 gigabit symmetrical service.
- **ONT:** Optical Network Terminal. Sometimes referred to as an ONU (Optical Network Unit). This is the GPON equivalent of a cable modem. It is installed at the customer premises and converts fiber into Ethernet. The customer plugs their wireless router into the ONT.
- **OLT:** Optical Line Terminal. Up to 64 customers connect to a single OLT port. There are multiple OLT ports on a network device. Also referred to as a PON port.
- **Remote OLT:** This device contains anywhere from 4 to 8 OLT ports in a hardened (weather sealed) enclosure. The remote OLT can be pole or strand mounted and is powered by our existing cable node power supplies. Anywhere from 256 to 512 customers will connect to each remote OLT.

Municipal Services Provided

AFN provides 47 strands of fiber to the city:

Fiber for City Services	
Fiber for City Buildings	27
Fiber for SCADA	17
Fiber for RVTV	2
Fiber for APD to Medford	1
Total number of strands	47

AFN also provides the City with redundant internet connections and as many public IP addresses as they need. AFN does not charge an installation fee for City fiber projects. We bill the department for raw materials (fiber, splice cases, etc.) but do not mark-up our costs.

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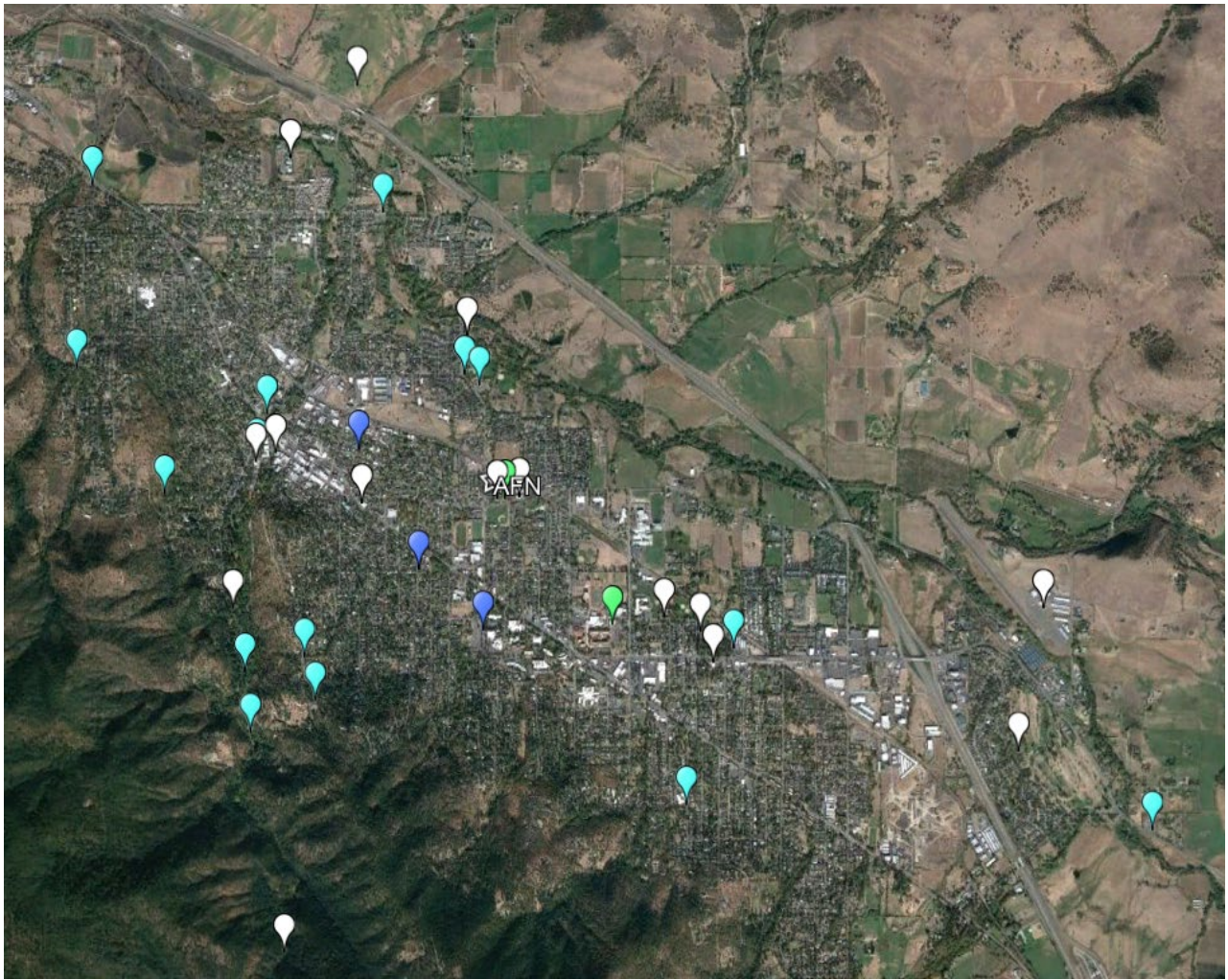
This map of Ashland shows every fiber connection provided to the city. White markers are City buildings. Aqua markers are SCADA. Dark blue are current fiber projects. Green markers are for RVTV.

FISCAL IMPACTS

Value of Municipal Service

To calculate the value of services AFN provides the City, we have researched previous fiber contracts between the City and other service providers, current contracts with other municipalities, franchise agreements, and fiber pricing within Oregon and across the country. Using this information, each strand of dark fiber that AFN provides the City is valued between $400 to $900 per month. The value of the multiple redundant 1 gigabit internet connections (DIA) is valued between $1,500 to $2,000 per month.

In addition to fiber services, AFN also contributes $584,170 to the city each year in the form of central services fees, facility fees, and maintenance fees. Please refer to the following table for the breakdown of services and fees.

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Customer/Provider	Service	Monthly Cost
Ashland Police Department	Point-to-point lit fiber (100 megabit)	$648
Ashland Police Department	Dark fiber	$864
City of Medford	Point-to-point lit fiber (100 megabit)	$355
City of Medford	Point-to-point lit fiber (100 megabit)	$408
City of Medford	1 Dark fiber & 1 point-to-point lit fiber (1 gigabit)	$1,286
City of Medford	BGP internet service (100 megabit)	$1,800
Medford Water Commission	DIA (1 gigabit)	$1,699
Medford Water Commission	DIA (1 gigabit)	$1,789
Medford Water Commission	DIA (1 gigabit)	$915
Medford Water Commission	DIA (100 megabit)	$495
Medford Water Commission	DIA (1 gigabit)	$600
Private school	DIA (1 gigabit)	$1,100
City of Tualatin	Point-to-point lit fiber	$600
Clackamas Broadband eXchange (CBX)	Dark fiber	$255
Eugene Water and Electric Board (EWEB)	Dark fiber	$31.70 per mile
Tennessee Valley Public Utility	Dark fiber	$1,000 - $2,000 per mile
Palo Alto Utilities	Dark fiber	$213 - $425 per mile

This table shows the pricing for fiber services in select markets. The top section in orange shows pricing for fiber customers in the Rogue Valley. The bottom section in green shows service provider prices from around Oregon and other locations. CBX and EWEB are both public utilities that were formed to provide the lowest cost services to public entities. CBX estimates that it saves taxpayers over $2 million each year.

Gross and Net Value of Services and Fees	
Number of strands used	47
Monthly value of each strand	$400 - $900
Total monthly value of all strands	$18,800 - $42,300
Monthly value of DIA circuit	$1,500 - $2,000
Total monthly value of all services	**$20,300 - $44,300**
Yearly value of all services	**$243,600 - $531,600**
Yearly central services fee	$467,068
Yearly facility use fee	$83,519
Yearly fleet maintenance fee	$33,582
Total of all fees	**$584,170**
Gross value of all services & fees	$827,770 - $1,115,770
Yearly fee paid by the City to AFN	$60,000
Net value of AFN services & fees	**$ 767,770 - $1,055,770**

*This table shows the breakdown of all services and fees provided by AFN. This does **not** include the $518,816 that AFN contributes to the debt.*

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Ashland School District

AFN provides multiple services to the Ashland School District:

- 2x10 Gbps internet connection
- Network rack in our head-end
- 17 strands of fiber

The value of these services is listed in the table below:

School District Services	
Number of strands used	17
Monthly value of each strand	$450 - $900
Total monthly value of all strands	$7,650 - $15,300
Monthly value of DIA circuits	$2,500 - $3,500
Monthly value of rack	$1000
Total monthly value of all services	**$11,150 - $19,800**
Yearly gross value of all services	**$133,800 - $237,600**
Yearly fee paid by ASD	$12,000
Net value of AFN services	**$121,800 - $225,600**

Local Businesses

Local businesses also benefit from AFN's presence in town. Spectrum's least expensive business plan costs $65 per month for the first year. The full retail price for their business internet is $80 (non-bundled).

Value Provided to Local Businesses	
Estimated number of AFN cable modem customers	418
Average monthly cost savings for cable modem customers	$15 - $25
Total yearly savings for business customers	**$75,904 - $127,009**

This table shows the estimated savings provided by AFN to local businesses.

Total Value of AFN

Conservatively, AFN saves the local taxpayers and businesses almost $1.2 million each year.

Total Yearly Value of AFN	
Net value of municipal services and fees	$767,770 - $1,055,770
Net value of services for ASD	$119,400
Yearly savings for businesses	$255,600
Total value of AFN	**$1,161,257**

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Revenue Forecasts

For the fiscal year of 2021, AFN's revenue from cable modem service was $2,371,495. The monthly average number of cable modem customers was 4,098. The Average Revenue Per User (ARPU) for 2021 was $48 per month. AFN has captured about 35% of the market share in Ashland.
We anticipate a slightly higher ARPU for GPON. The ARPU increases as customers upgrade to higher tier service plans.

Year	2021	2022	2023	2024	2025	2026	2027
Customer Count	4098	4142	4183	4246	4289	4417	4550
Cable Modem Ct	4098	4142	4142	4034	3860	3755	3185
GPON Ct	0	0	42	212	429	663	1365
Cable Modem ARPU	$48	$51	$51	$51	$52	$52	$52
GPON ARPU	$0.00	$0.00	$50	$50	$51	$51	$52
Market Share	34.15%	34.52%	34.86%	35.38%	35.74%	36.81%	37.92%
Yearly Revenue	$2,371,495	$2,514,755	$2,559,751	$2,596,109	$2,670,961	$2,748,439	$2,839,082

Year	2028	2029	2030	2031	2032	2033	2034
Customer Count	4823	5112	5163	5215	5267	5320	5373
Cable Modem Ct	2411	1534	774	0	0	0	0
GPON Ct	2411	3579	4389	5215	5267	5320	5373
Cable Modem ARPU	$52	$52	$52	$0	$0	$0	$0
GPON ARPU	$52	$52	$52	$52	$52	$52	$52
Market Share	40.19%	42.60%	43.03%	43.46%	43.89%	44.33%	44.77%
Yearly Revenue	$3,009,427	$3,189,992	$3,221,892	$3,254,111	$3,286,652	$3,319,519	$3,352,714

STAFF RECOMMENDATION

To remain competitive, we recommend upgrading AFN from hybrid fiber-coax network to one that is 100% fiber (GPON). This is what is known as "fiber to the home." Fiber is a future proof medium. The same strand of fiber that delivered 1 gigabit service yesterday delivers 10 gigabit service today, 25 gigabit service in five years, and 100 gigabit service in ten years. To achieve this, staff recommends pursuing option #1, deploying fiber through a pilot project, which is the lowest cost and presents the least amount of risk. We anticipate this project will cost between $885,000 and $1 million and will take 1 to 2 years to complete. Funding sources will need to be identified before proceeding.

REFERENCES & ATTACHMENTS
NA

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