

Appendix B

Overview & Street-Level Budget – Open Access Regional Fiber Loop

Following is a more detailed description of the proposed Open Access Fiber Loop introduced in section VI of the Maine West Regional Technology Plan.

Recommendation #6 - Open Access Regional Fiber Optic Loop

Oxford County has a significant amount of fiber optic cabling that Spectrum, FirstLight, Consolidated and GWI own or operate. However, these assets are not utilized to bring service to the home and act only as transport to service private operators' equipment and power their current technology. They do not establish fiber to the premise solutions, except in the case of individual businesses that can afford the cost of hooking up directly to the fiber.

The area is also served by the Three Ring Binder (3RB) which was created as a middle mile, high capacity highway of dark fiber that would reach many parts of the state that did not have that capacity available to them. At the time it was conceived, the idea of having fiber that was open to everyone (open access) at pricing that would be the same for every provider was seen as a way to level the playing field for the smaller providers who did not have the capital to provide the infrastructure themselves and create a more competitive environment where prices might come down for consumers.

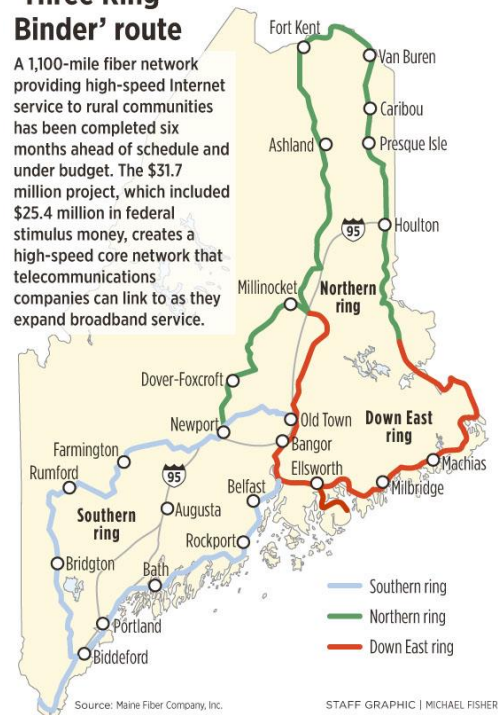
Not all of the promise of the 3RB has been realized, but it remains a powerful tool to bring almost unlimited capacity to Oxford County and across the state. By connecting to it, you can reap the benefits of preserving open access networks that give all potential users (internet service providers) equal access, on terms dictated by a regional entity or some other public oversight that presents the opportunity for more control over Broadband offerings.

Consolidated Communications and FirstLight both have fiber throughout Oxford County, and they can be leveraged and utilized. But, by doing so you are less likely to have the type of control and partnerships with the ISPs that would balance the scale and give the region a stronger voice in how ISPs deliver their service. In short, the 3RB gives the region an option to create real public-private partnerships with the ISPs that will utilize the open access network.

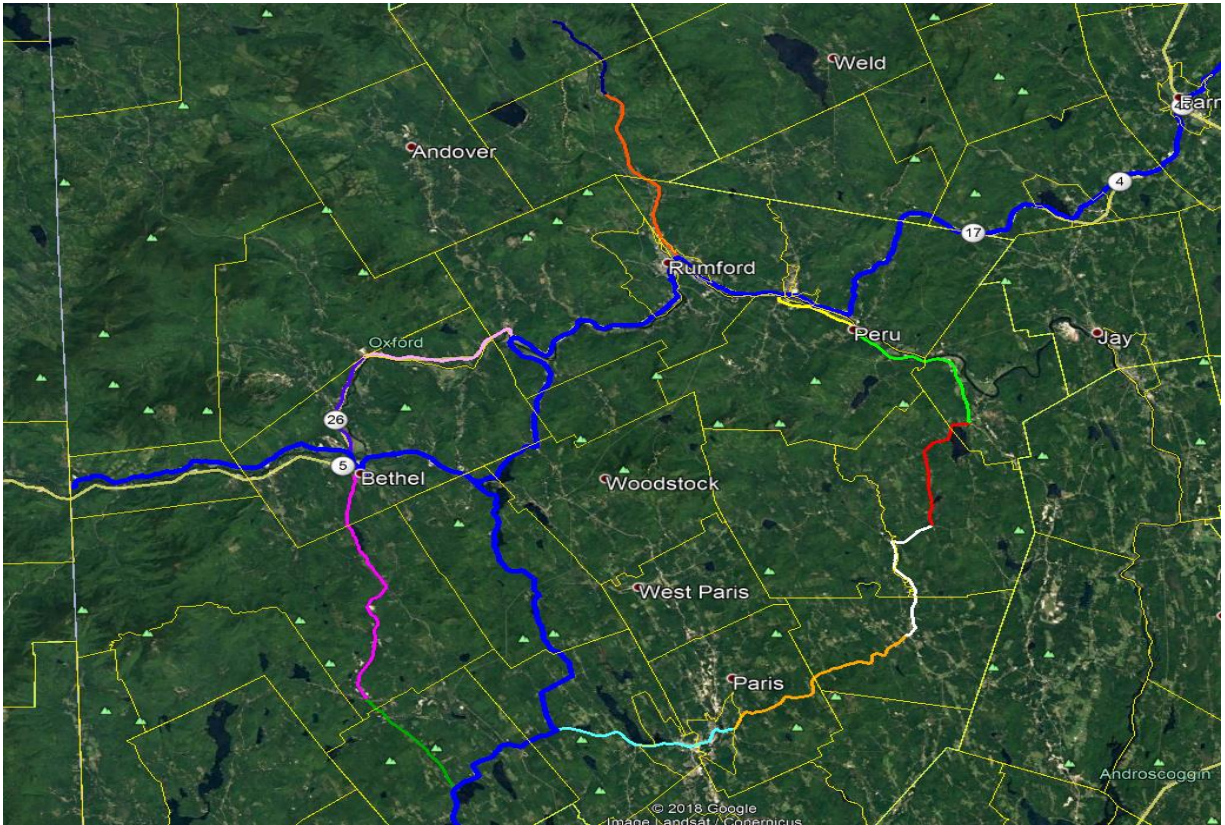
Axiom recommends a long-term plan to build a high capacity extension off the Three Ring Binder to expand this network to more communities and create the conditions for those communities to have open-access fiber. By connecting this new loop to the 3RB, the region can preserve open access, promote competition, dictate terms of use, and generally provide access to participating private ISPs.

'Three Ring Binder' route

A 1,100-mile fiber network providing high-speed Internet service to rural communities has been completed six months ahead of schedule and under budget. The \$31.7 million project, which included \$25.4 million in federal stimulus money, creates a high-speed core network that telecommunications companies can link to as they expand broadband service.



Proposed Regional Open Access Fiber Loop



In the graphic above, the 3RB is depicted in blue; the other colored lines represent the proposed segments that would need to be built to create the loop. There is one spur that would run from Mexico through Roxbury and Byron on Route 17.

While this recommendation does not deliver direct connections to homes or businesses, it provides the conditions and backbone of fiber necessary to support individual community build-outs to the premise. This is a big, multi-year project that should be viewed as an aspirational idea that might be considered if a significant federal program were established similar to the one that built the \$32 million 3RB. The idea here is to extend the idea and concept of the 3RB as a regional approach that could help more communities consider fiber networks that can support near and long-term connectivity demands of the region.

Total Cost of Project:

Fiber Materials	\$1,047,861.00
Fiber Labor	\$1,679,195.00
Licensing and Make Ready	\$598,815.00
Replacement Poles (10%)	\$681,000.00
Total	\$4,006,871.00

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Total	\$4,006,871.00

Fiber Materials

Fiber Materials refers to the cost of the trunk cable and associated equipment to hang the cable and the equipment needed to power the internet system.

Fiber Labor

Fiber Labor refers to the cost of manpower needed to string the fiber along the utility poles.

Licensing and Make Ready

Licensing and Make Ready refers to the cost of applying for utility pole rights and the associated cost of making the poles ready to accept a new fiber cable. In order to install new fiber optics cable on utility poles, a licensing process is in place that also evaluates each pole for readiness to accept a new cable. Each provider (other than the electrical) would move the current lines to accommodate a space for a new cable. The cost of this process is estimated in our calculations and can change depending on the application process costs.

Replacement Poles (10%)

We estimate that 10% of the poles, through the licensing process might need replacement. There are two major reasons for pole replacements. First, the amount of equipment or utility lines on a pole deem it necessary to increase the height of the current pole to allow for an additional line to be placed on it (pole too short). Or, the current pole is aged to the point where it would be unsafe to place the additional line strain on the pole without a replacement pole (Aged poles). We make an estimate, but these issues get addressed through the application and Make Ready process.

Ownership Options

Public

If the loop in whole or in part is built with public money, either state, federal or local, the issue of who would own the network will be a question that will need to be answered. There are examples nationally of networks that were poorly managed by either a public entity or a licensed private operator that the public entity contracted with to provide the services and maintenance on the network. There are also success stories.

There was a law change in Maine that allows a region or band of communities to come together a form a Broadband utility. It is based on older regional cooperatives with a Board of Directors of local elected officials who would manage the system and contract out various aspects of the network operation. Recently, the communities of Calais and Baileyville have formed this type of Broadband utility to manage the construction and operation of a new FTTH project in each community that they hope to build. This is a model that is being utilized in Islesboro, where the town maintains ownership, and the cost of break/fix including equipment and has hired a network operator for a fixed yearly fee to operate the network.

If the communities in the region were to come together to form such a partnership, there are several questions that would need to be answered including:

- Will communities who join pay in to a fund as part of the local contribution to the construction?
- What would the financial oversight look like and would, for example, the entity have bonding authority?
- How will the system(s) built be maintained and operated?

Public-Private

This model can have several options, but in general as the project finds potential funding, an RFP would be issued for contractor services to build the network and/or operate it once it was built. In this scenario, a public-private partnership agreement (franchise) would be negotiated with a private operator who would take responsibility for the network maintenance and upkeep in exchange for operating and serving customers on the network exclusively.

A Service Level Agreement would be part of the negotiated Public-Private Partnership Agreement and would spell out potential service speeds and cost tiers to the subscribers, as well as other details, such as response times for break/fix, etc. There is less risk to the community, but the public-private partnership contract becomes critical to spelling out who is responsible for what. This is the model being used in the Town of Cranberry Isles.

Questions in this model include:

- Is there a revenue model that can help pay for the initial capital cost of the network build?
- Does the public entity retain some level of the maintenance of the system, to reduce cost and risk to the operator? Or vice versa, is the maintenance fully the responsibility of the ISP which in turn could raise prices or not make the operation of the system attractive enough for potential operators?
- Would this be a long-term contract (10 years or more)?

Private

This is what you essentially have now, a series of operators (ISPs) who deliver service based on market profitability and customer demand, with pricing and service levels entirely dictated by the ISP.

In the case of the fiber loop proposal, there would be a substantial, if not entire public subsidy, for the system to be built, and an ISP would essentially take it over, either immediately or over time. This is the least risky to the towns or region, but it also offers little to no control once the system is in place and handed over to the ISP for operation.

Questions to be asked:

- Do we as a community/region have the expertise to operate a fiber system?
- Do we want to leave the system in private hands with no opportunity to discuss service levels and pricing?
- Can we legally hand over an infrastructure project to a private entity after using public dollars to build it?
- Would a private entity contribute to the cost of the construction with the promise to own and operate exclusively on the network?

There certainly is a significant amount of thought and research on how ownership would work and many options within each of the three ownership scenarios listed above.

Axiom Recommendations:

- Form a regional entity or task the regional Broadband Committee to explore all options and make a recommendation
- Apply for a grant to help fund such a study
- Begin to outreach to the communities to discuss options
- Look for federal funding to support the construction

Fiber Segments

Each segment of the loop has been broken down to allow for individual engineering and cost analysis. Each can stand on its own as a project; however, it is important to keep in mind that the equipment and the number of fiber counts in the trunk line are built to accommodate the whole loop.

The cost of the project does not include the equipment necessary to “light fibers up” for internet service to flow. This aspect of the delivery system would be negotiated through contracts (Public-Private partnership agreements) with the providers proposing to deliver service to communities around the loop using the system.

Last, please remain aware that off-ramps to this system would have to be built to penetrate areas or communities and serve homes or businesses. Those off ramps, along with the equipment to power the FTTH (Fiber To The Home) projects are significant and would most likely need additional subsidy to successfully attract providers to the table. This remains to be seen but is an important point to consider. Building a loop of fiber would be the first step in getting blazing fast, reliable fiber service to the communities it passes through (just like the Three Ring Binder).

Bethel to Stoneham- Bright Pink Segment

Bethel to Stoneham				
Make Ready				
326	Make ready (50% poles)	163	\$450.00	\$73,350.00
	Make Ready Total			\$73,350.00
Fiber Materials				
65472	Fiber	78567	\$0.95	\$74,638.65
	Attachment Hardware	78567	\$0.75	\$58,925.25
	Snowshoes for slack loops	44	\$80.00	\$3,520.00
	Down Guys and Guards	326	\$25.00	\$8,150.00
	Fiber Splice Case	14	\$450.00	\$6,300.00
	Material Total			\$151,533.90
Fiber Installation				
	Fiber Installation	78567	\$1.50	\$117,850.50
	Snowshoe install	44	\$150.00	\$6,600.00
	Guy Installation	326	\$50.00	\$16,300.00
	Anchor Installation, including anchor	326	\$175.00	\$57,050.00
	Fiber Splicing	44	\$1,000.00	\$44,000.00
	Labor Total			\$241,800.50
	Total cost of Segment			\$466,685.00

Stoneham to Waterford—Green segment

Stoneham to Waterford				
Make Ready				
134	Make ready (50% poles)	67	\$450.00	\$30,150.00
	Make Ready Total			\$30,150.00
Fiber Materials				
29683	Fiber	35620	\$0.95	\$33,839.00
	Attachment Hardware	35620	\$0.75	\$26,715.00
	Snowshoes for slack loops	20	\$80.00	\$1,600.00
	Down Guys and Guards	134	\$25.00	\$3,350.00
	Fiber Splice Case	6	\$450.00	\$2,700.00
	Material Total			\$68,204.00
Fiber Installation				
	Fiber Installation	35620	\$1.50	\$53,430.00
	Snowshoe install	20	\$150.00	\$3,000.00
	Guy Installation	134	\$50.00	\$6,700.00
	Anchor Installation, including anchor	134	\$175.00	\$23,450.00
	Fiber Splicing	20	\$1,000.00	\$20,000.00
	Labor Total			\$106,580.00
	Total cost of segment			\$204,934.00

Waterford to Norway—Aqua segment



Waterford to Norway				
Make Ready				
233	Make ready (50% poles)	117	\$450.00	\$52,650.00
	Make Ready Total			\$52,650.00
Fiber Materials				
38294	Fiber	45953	\$0.95	\$43,655.35
	Attachment Hardware	45953	\$0.75	\$34,464.75
	Snowshoes for slack loops	26	\$80.00	\$2,080.00
	Down Guys and Guards	233	\$25.00	\$5,825.00
	Fiber Splice Case	8	\$450.00	\$3,600.00
	Material Total			\$89,625.10
Fiber Installation				
	Fiber Installation	45953	\$1.50	\$68,929.50
	Snowshoe install	26	\$150.00	\$3,900.00
	Guy Installation	233	\$50.00	\$11,650.00
	Anchor Installation, including anchor	233	\$175.00	\$40,775.00
	Fiber Splicing	26	\$1,000.00	\$26,000.00
	Labor Total			\$151,254.50
	Total cost of segment			\$293,530.00

Norway to Buckfield—Orange Segment

Norway to Buckfield				
Make Ready				
168	Make ready (50% poles)	84	\$450.00	\$37,800.00
	Make Ready Total			\$37,800.00
Fiber Materials				
52183	Fiber	62620	\$0.95	\$59,489.00
	Attachment Hardware	62620	\$0.75	\$46,965.00
	Snowshoes for slack loops	35	\$80.00	\$2,800.00
	Down Guys and Guards	168	\$25.00	\$4,200.00
	Fiber Splice Case	11	\$450.00	\$4,950.00
	Material Total			\$118,404.00
Fiber Installation				
	Fiber Installation	62620	\$1.50	\$93,930.00
	Snowshoe install	35	\$150.00	\$5,250.00
	Guy Installation	168	\$50.00	\$8,400.00
	Anchor Installation, including anchor	168	\$175.00	\$29,400.00
	Fiber Splicing	35	\$1,000.00	\$35,000.00
	Labor Total			\$171,980.00
	Total Cost of Segment			\$328,185.00

Buckfield to Hartford—White Segment

Buckfield to Hartford

Make Ready				
324	Make ready (50% poles)	162	\$450.00	\$72,900.00
	Make Ready Total			\$72,900.00
Fiber Materials				
37048	Fiber	44458	\$0.95	\$42,235.10
	Attachment Hardware	44458	\$0.75	\$33,343.50
	Snowshoes for slack loops	25	\$80.00	\$2,000.00
	Down Guys and Guards	324	\$25.00	\$8,100.00
	Fiber Splice Case	8	\$450.00	\$3,600.00
	Material Total			\$89,278.60
Fiber Installation				
	Fiber Installation	44458	\$1.50	\$66,687.00
	Snowshoe install	25	\$150.00	\$3,750.00
	Guy Installation	324	\$50.00	\$16,200.00
	Anchor Installation, including anchor	324	\$175.00	\$56,700.00
	Fiber Splicing	25	\$1,000.00	\$25,000.00
	Labor Total			\$168,337.00
	Total Cost of segment			\$330,516.00

Hartford to Canton—Red Segment

Hartford to Canton				
Make Ready				
156	Make ready (50% poles)	78	\$450.00	\$35,100.00
	Make Ready Total			\$35,100.00
Fiber Materials				
33098	Fiber	39718	\$0.95	\$37,732.10
	Attachment Hardware	39718	\$0.75	\$29,788.50
	Snowshoes for slack loops	23	\$80.00	\$1,840.00
	Down Guys and Guards	156	\$25.00	\$3,900.00
	Fiber Splice Case	7	\$450.00	\$3,150.00
	Material Total			\$76,410.60
Fiber Installation				
	Fiber Installation	39718	\$1.50	\$59,577.00
	Snowshoe install	23	\$150.00	\$3,450.00
	Guy Installation	156	\$50.00	\$7,800.00
	Anchor Installation, including anchor	156	\$175.00	\$27,300.00
	Fiber Splicing	23	\$1,000.00	\$23,000.00
	Labor Total			\$121,127.00
	Total Cost of segments			\$232,638.00

Canton to Peru—Bright Green segment

Canton to Peru



Make Ready				
183	Make ready (50% poles)	92	\$450.00	\$41,400.00
	Make Ready Total			\$41,400.00
Fiber Materials				
40506	Fiber	48608	\$0.95	\$46,177.60
	Attachment Hardware	48608	\$0.75	\$36,456.00
	Snowshoes for slack loops	28	\$80.00	\$2,240.00
	Down Guys and Guards	183	\$25.00	\$4,575.00
	Fiber Splice Case	9	\$450.00	\$4,050.00
	Material Total			\$93,498.60
Fiber Installation				
	Fiber Installation	48608	\$1.50	\$72,912.00
	Snowshoe install	28	\$150.00	\$4,200.00
	Guy Installation	183	\$50.00	\$9,150.00
	Anchor Installation, including anchor	183	\$175.00	\$32,025.00
	Fiber Splicing	28	\$1,000.00	\$28,000.00
	Labor Total			\$146,287.00
	Total Cost of segment			\$281,186.00

Peru to Dixfield—Yellow segment

Peru to Dixfield				
Make Ready				
92	Make ready (50% poles)	46	\$450.00	\$20,700.00
	Make Ready Total			\$20,700.00
Fiber Materials				
18469	Fiber	22163	\$0.95	\$21,054.85
	Attachment Hardware	22163	\$0.75	\$16,622.25
	Snowshoes for slack loops	13	\$80.00	\$1,040.00
	Down Guys and Guards	92	\$25.00	\$2,300.00
	Fiber Splice Case	4	\$450.00	\$1,800.00
	Material Total			\$42,817.10
Fiber Installation				
	Fiber Installation	22163	\$1.50	\$33,244.50
	Snowshoe install	13	\$150.00	\$1,950.00
	Guy Installation	92	\$50.00	\$4,600.00
	Anchor Installation, including anchor	92	\$175.00	\$16,100.00
	Fiber Splicing	13	\$1,000.00	\$13,000.00
	Labor Total			\$68,894.50
	Total cost of segment			\$132,313.00

Bethel to Newry—Blue segment



Bethel to Newry				
Make Ready				
121	Make ready (50% poles)	61	\$450.00	\$27,450.00
Make Ready Total				\$27,450.00
Fiber Materials				
27597	Fiber	33117	\$0.95	\$31,461.15
	Attachment Hardware	33117	\$0.75	\$24,837.75
	Snowshoes for slack loops	19	\$80.00	\$1,520.00
	Down Guys and Guards	121	\$25.00	\$3,025.00
	Fiber Splice Case	6	\$450.00	\$2,700.00
Material Total				\$63,543.90
Fiber Installation				
	Fiber Installation	33117	\$1.50	\$49,675.50
	Snowshoe install	19	\$150.00	\$2,850.00
	Guy Installation	121	\$50.00	\$6,050.00
	Anchor Installation, including anchor	121	\$175.00	\$21,175.00
	Fiber Splicing	19	\$1,000.00	\$19,000.00
Labor Total				\$98,750.50
Total Cost of segment				\$189,745.00

Newry to Hanover—Pink segment

Newry to Hanover				
Make Ready				
163	make ready (50% poles)	82	\$450.00	\$36,900.00
Make Ready Total				\$36,900.00
Fiber Materials				
36401	Fiber	43682	\$0.95	\$41,497.90
	Attachment Hardware	43682	\$0.75	\$32,761.50
	Snowshoes for slack loops	25	\$80.00	\$2,000.00
	Down Guys and Guards	163	\$25.00	\$4,075.00
	Fiber Splice Case	8	\$450.00	\$3,600.00
Material Total				\$83,934.40
Fiber Installation				
	Fiber Installation	43682	\$1.50	\$65,523.00
	Snowshoe install	25	\$150.00	\$3,750.00
	Guy Installation	163	\$50.00	\$8,150.00
	Anchor Installation, including anchor	163	\$175.00	\$28,525.00
	Fiber Splicing	25	\$1,000.00	\$25,000.00
Labor Total				\$130,948.00
Total cost of segment				\$251,782.00

Mexico to Roxbury—Orange segment

Mexico to Roxbury				
Make Ready				
257	Make ready (50% poles)	129	\$450.00	\$58,050.00
Make Ready Total				\$58,050.00
Fiber Materials				
49423	Fiber	59308	\$0.95	\$56,342.60
	Attachment Hardware	59308	\$0.75	\$44,481.00
	Snowshoes for slack loops	33	\$80.00	\$2,640.00
	Down Guys and Guards	257	\$25.00	\$6,425.00
	Fiber Splice Case	10	\$450.00	\$4,500.00
Material Total				\$114,388.60
Fiber Installation				
	Fiber Installation	59308	\$1.50	\$88,962.00
	Snowshoe install	33	\$150.00	\$4,950.00
	Guy Installation	257	\$50.00	\$12,850.00
	Anchor Installation, including anchor	257	\$175.00	\$44,975.00
	Fiber Splicing	33	\$1,000.00	\$33,000.00
Labor Total				\$184,737.00
Total Cost of segment				\$357,176.00

Roxbury to Byron—Dark Blue Segment

Roxbury to Byron				
Make Ready				
111	Make ready (50% poles)	56	\$450.00	\$25,200.00
Make Ready Total				\$25,200.00
Fiber Materials				
24430	Fiber	29316	\$0.95	\$27,850.20
	Attachment Hardware	29316	\$0.75	\$21,987.00
	Snowshoes for slack loops	17	\$80.00	\$1,360.00
	Down Guys and Guards	111	\$25.00	\$2,775.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$56,222.20
Fiber Installation				
	Fiber Installation	29316	\$1.50	\$43,974.00
	Snowshoe install	17	\$150.00	\$2,550.00
	Guy Installation	111	\$50.00	\$5,550.00
	Anchor Installation, including anchor	111	\$175.00	\$19,425.00
	Fiber Splicing	17	\$1,000.00	\$17,000.00
Labor Total				\$88,499.00
Total Cost of segment				\$169,921.00

Bethel Fiber Budget

Bethel Pink line

Walker's Mill Rd				
Make Ready				
45	Make ready (50% poles)	23	\$450.00	\$10,350.00
Make Ready Total				\$10,350.00
Fiber Materials				
7645	Fiber	9174	\$0.95	\$8,715.30
	Attachment Hardware	9174	\$0.75	\$6,880.50
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	45	\$25.00	\$1,125.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$40,070.80
Fiber Installation				
	Fiber Installation	9174	\$1.50	\$13,761.00
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	45	\$50.00	\$2,250.00
	Anchor Installation, including anchor	45	\$175.00	\$7,875.00
	Fiber Splicing	5	\$500.00	\$2,500.00
Labor Total				\$27,136.00
TOTAL COST of Road				\$77,559.00

Main St				
Make Ready				
21	Make ready (50% poles)	11	\$450.00	\$4,950.00
Make Ready Total				\$4,950.00
Fiber Materials				
1431	Fiber	1718	\$0.95	\$1,632.10
	Attachment Hardware	1718	\$0.75	\$1,288.50
	Snowshoes for slack loops	6	\$80.00	\$480.00
	Down Guys and Guards	21	\$25.00	\$525.00
	Fiber Splice Case	6	\$450.00	\$2,700.00
Material Total				\$16,525.60
Fiber Installation				
	Fiber Installation	1718	\$1.50	\$2,577.00
	Snowshoe install	6	\$150.00	\$900.00
	Guy Installation	21	\$50.00	\$1,050.00
	Anchor Installation, including anchor	21	\$175.00	\$3,675.00
	Fiber Splicing	6	\$500.00	\$3,000.00

Labor Total	\$11,202.00
TOTAL COST of Street	\$32,678.00

Cross St				
Make Ready				
7	Make ready (50% poles)	4	\$450.00	\$1,800.00
Make Ready Total				\$1,800.00
Fiber Materials				
1020	Fiber	1224	\$0.95	\$1,162.80
	Attachment Hardware	1224	\$0.75	\$918.00
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	7	\$25.00	\$175.00
	Fiber Splice Case	1	\$450.00	\$450.00
Material Total				\$6,385.80
Fiber Installation				
	Fiber Installation	1224	\$1.50	\$1,836.00
	Snowshoe install	1	\$150.00	\$150.00
	Guy Installation	7	\$50.00	\$350.00
	Anchor Installation, including anchor	7	\$175.00	\$1,225.00
	Fiber Splicing	1	\$500.00	\$500.00
Labor Total				\$4,061.00
TOTAL COST of Street				\$12,247.00

Mechanics St				
Make Ready				
6	Make ready (50% poles)	3	\$450.00	\$1,350.00
Make Ready Total				\$1,350.00
Fiber Materials				
985	Fiber	1182	\$0.95	\$1,122.90
	Attachment Hardware	1182	\$0.75	\$886.50
	Snowshoes for slack loops	3	\$80.00	\$240.00
	Down Guys and Guards	6	\$25.00	\$150.00
	Fiber Splice Case	3	\$450.00	\$1,350.00
Material Total				\$6,449.40
Fiber Installation				
	Fiber Installation	1182	\$1.50	\$1,773.00
	Snowshoe install	3	\$150.00	\$450.00
	Guy Installation	6	\$50.00	\$300.00
	Anchor Installation, including anchor	6	\$175.00	\$1,050.00
	Fiber Splicing	3	\$500.00	\$1,500.00

Labor Total	\$5,073.00
TOTAL COST of Street	\$12,872.00

Elm St				
Make Ready				
14	Make ready (50% poles)	7	\$450.00	\$3,150.00
Make Ready Total				\$3,150.00
Fiber Materials				
1716	Fiber	2060	\$0.95	\$1,957.00
	Attachment Hardware	2060	\$0.75	\$1,545.00
	Snowshoes for slack loops	3	\$80.00	\$240.00
	Down Guys and Guards	14	\$25.00	\$350.00
	Fiber Splice Case	3	\$450.00	\$1,350.00
Material Total				\$11,742.00
Fiber Installation				
	Fiber Installation	2060	\$1.50	\$3,090.00
	Snowshoe install	3	\$150.00	\$450.00
	Guy Installation	14	\$50.00	\$700.00
	Anchor Installation, including anchor	14	\$175.00	\$2,450.00
	Fiber Splicing	3	\$500.00	\$1,500.00
Labor Total				\$8,190.00
TOTAL COST of Street				\$23,082.00

Church St				
Make Ready				
17	Make ready (50% poles)	9	\$450.00	\$4,050.00
Make Ready Total				\$4,050.00
Fiber Materials				
2196	Fiber	2636	\$0.95	\$2,504.20
	Attachment Hardware	2636	\$0.75	\$1,977.00
	Snowshoes for slack loops	4	\$80.00	\$320.00
	Down Guys and Guards	17	\$25.00	\$425.00
	Fiber Splice Case	4	\$450.00	\$1,800.00
Material Total				\$15,126.20
Fiber Installation				
	Fiber Installation	2636	\$1.50	\$3,954.00
	Snowshoe install	4	\$150.00	\$600.00
	Guy Installation	17	\$50.00	\$850.00
	Anchor Installation, including anchor	17	\$175.00	\$2,975.00
	Fiber Splicing	4	\$500.00	\$2,000.00

Labor Total	\$10,379.00
TOTAL COST of Street	\$29,555.00

US RT 2 North				
Make Ready				
46	Make ready (50% poles)	23	\$450.00	\$10,350.00
Make Ready Total				\$10,350.00
Fiber Materials				
8739	Fiber	10487	\$0.95	\$9,962.65
	Attachment Hardware	10487	\$0.75	\$7,865.25
	Snowshoes for slack loops	9	\$80.00	\$720.00
	Down Guys and Guards	46	\$25.00	\$1,150.00
	Fiber Splice Case	9	\$450.00	\$4,050.00
Material Total				\$44,447.90
Fiber Installation				
	Fiber Installation	10487	\$1.50	\$15,730.50
	Snowshoe install	9	\$150.00	\$1,350.00
	Guy Installation	46	\$50.00	\$2,300.00
	Anchor Installation, including anchor	46	\$175.00	\$8,050.00
	Fiber Splicing	9	\$500.00	\$4,500.00
Labor Total				\$31,930.50
TOTAL COST of Route 2- North				\$86,729.00

Broad St				
Make Ready				
12	Make ready (50% poles)	6	\$450.00	\$2,700.00
Make Ready Total				\$2,700.00
Fiber Materials				
1630	Fiber	1956	\$0.95	\$1,858.20
	Attachment Hardware	1956	\$0.75	\$1,467.00
	Snowshoes for slack loops	2	\$80.00	\$160.00
	Down Guys and Guards	12	\$25.00	\$300.00
	Fiber Splice Case	2	\$450.00	\$900.00
Material Total				\$10,085.20
Fiber Installation				
	Fiber Installation	1956	\$1.50	\$2,934.00
	Snowshoe install	2	\$150.00	\$300.00
	Guy Installation	12	\$50.00	\$600.00
	Anchor Installation, including anchor	12	\$175.00	\$2,100.00
	Fiber Splicing	2	\$500.00	\$1,000.00

Labor Total	\$6,934.00
TOTAL COST of Street	\$19,719.00

Paradise Hill Rd				
Make Ready				
60	Make ready (50% poles)	30	\$450.00	\$13,500.00
Make Ready Total				\$13,500.00
Fiber Materials				
11312	Fiber	13575	\$0.95	\$12,896.25
	Attachment Hardware	13575	\$0.75	\$10,181.25
	Snowshoes for slack loops	10	\$80.00	\$800.00
	Down Guys and Guards	60	\$25.00	\$1,500.00
	Fiber Splice Case	10	\$450.00	\$4,500.00
Material Total				\$56,877.50
Fiber Installation				
	Fiber Installation	13575	\$1.50	\$20,362.50
	Snowshoe install	10	\$150.00	\$1,500.00
	Guy Installation	60	\$50.00	\$3,000.00
	Anchor Installation, including anchor	60	\$175.00	\$10,500.00
	Fiber Splicing	10	\$500.00	\$5,000.00
Labor Total				\$40,362.50
TOTAL COST of Road				\$110,741.00

Mill Hill Rd				
Make Ready				
11	Make ready (50% poles)	6	\$450.00	\$2,700.00
Make Ready Total				\$2,700.00
Fiber Materials				
1548	Fiber	1858	\$0.95	\$1,765.10
	Attachment Hardware	1858	\$0.75	\$1,393.50
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	11	\$25.00	\$275.00
	Fiber Splice Case	1	\$450.00	\$450.00
Material Total				\$9,363.60
Fiber Installation				
	Fiber Installation	1858	\$1.50	\$2,787.00
	Snowshoe install	1	\$150.00	\$150.00
	Guy Installation	11	\$50.00	\$550.00
	Anchor Installation, including anchor	11	\$175.00	\$1,925.00
	Fiber Splicing	1	\$500.00	\$500.00

Labor Total	\$5,912.00
TOTAL COST of Road	\$17,976.00

Chapman St				
Make Ready				
17	Make ready (50% poles)	9	\$450.00	\$4,050.00
Make Ready Total				\$4,050.00
Fiber Materials				
2702	Fiber	3243	\$0.95	\$3,080.85
	Attachment Hardware	3243	\$0.75	\$2,432.25
	Snowshoes for slack loops	4	\$80.00	\$320.00
	Down Guys and Guards	17	\$25.00	\$425.00
	Fiber Splice Case	4	\$450.00	\$1,800.00
Material Total				\$16,158.10
Fiber Installation				
	Fiber Installation	3243	\$1.50	\$4,864.50
	Snowshoe install	4	\$150.00	\$600.00
	Guy Installation	17	\$50.00	\$850.00
	Anchor Installation, including anchor	17	\$175.00	\$2,975.00
	Fiber Splicing	4	\$500.00	\$2,000.00
Labor Total				\$11,289.50
TOTAL COST of Street				\$31,498.00

Vernon St				
Make Ready				
61	Make ready (50% poles)	31	\$450.00	\$13,950.00
Make Ready Total				\$13,950.00
Fiber Materials				
10317	Fiber	12381	\$0.95	\$11,761.95
	Attachment Hardware	12381	\$0.75	\$9,285.75
	Snowshoes for slack loops	7	\$80.00	\$560.00
	Down Guys and Guards	61	\$25.00	\$1,525.00
	Fiber Splice Case	7	\$450.00	\$3,150.00
Material Total				\$54,182.70
Fiber Installation				
	Fiber Installation	12381	\$1.50	\$18,571.50
	Snowshoe install	7	\$150.00	\$1,050.00
	Guy Installation	61	\$50.00	\$3,050.00
	Anchor Installation, including anchor	61	\$175.00	\$10,675.00
	Fiber Splicing	7	\$500.00	\$3,500.00

Labor Total	\$36,846.50
TOTAL COST of Street	\$104,980.00

Parkway Rd				
Make Ready				
7	Make ready (50% poles)	4	\$450.00	\$1,800.00
Make Ready Total				\$1,800.00
Fiber Materials				
979	Fiber	1175	\$0.95	\$1,116.25
	Attachment Hardware	1175	\$0.75	\$881.25
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	7	\$25.00	\$175.00
	Fiber Splice Case	1	\$450.00	\$450.00
Material Total				\$6,302.50
Fiber Installation				
	Fiber Installation	1175	\$1.50	\$1,762.50
	Snowshoe install	1	\$150.00	\$150.00
	Guy Installation	7	\$50.00	\$350.00
	Anchor Installation, including anchor	7	\$175.00	\$1,225.00
	Fiber Splicing	1	\$500.00	\$500.00
Labor Total				\$3,987.50
TOTAL COST of Road				\$12,090.00

West Bethel- Green line

US RT 2 West				
Make Ready				
122	Make ready (50% poles)	61	\$450.00	\$27,450.00
Make Ready Total				\$27,450.00
Fiber Materials				
22138	Fiber	26566	\$0.95	\$25,237.70
	Attachment Hardware	26566	\$0.75	\$19,924.50
	Snowshoes for slack loops	12	\$80.00	\$960.00
	Down Guys and Guards	122	\$25.00	\$3,050.00
	Fiber Splice Case	12	\$450.00	\$5,400.00
Material Total				\$109,472.20
Fiber Installation				
	Fiber Installation	26566	\$1.50	\$39,849.00
	Snowshoe install	12	\$150.00	\$1,800.00

Guy Installation	122	\$50.00	\$6,100.00
Anchor Installation, including anchor	122	\$175.00	\$21,350.00
Fiber Splicing	12	\$500.00	\$6,000.00
Labor Total			\$75,099.00
TOTAL COST of Route 2			\$212,021.00

Barker Rd				
Make Ready				
36	Make ready (50% poles)	18	\$450.00	\$8,100.00
Make Ready Total				\$8,100.00
Fiber Materials				
5535	Fiber	6642	\$0.95	\$6,309.90
	Attachment Hardware	6642	\$0.75	\$4,981.50
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	36	\$25.00	\$900.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$31,041.40
Fiber Installation				
	Fiber Installation	6642	\$1.50	\$9,963.00
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	36	\$50.00	\$1,800.00
	Anchor Installation, including anchor	36	\$175.00	\$6,300.00
	Fiber Splicing	5	\$500.00	\$2,500.00
Labor Total				\$21,313.00
TOTAL COST of Road				\$60,454.00

Mountain View Cir				
Make Ready				
7	Make ready (50% poles)	4	\$450.00	\$1,800.00
Make Ready Total				\$1,800.00
Fiber Materials				
1652	Fiber	1983	\$0.95	\$1,883.85
	Attachment Hardware	1983	\$0.75	\$1,487.25
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	7	\$25.00	\$175.00
	Fiber Splice Case	1	\$450.00	\$450.00
Material Total				\$7,676.10
Fiber Installation				
	Fiber Installation	1983	\$1.50	\$2,974.50
	Snowshoe install	1	\$150.00	\$150.00

Guy Installation	7	\$50.00	\$350.00
Anchor Installation, including anchor	7	\$175.00	\$1,225.00
Fiber Splicing	1	\$500.00	\$500.00
Labor Total			\$5,199.50
TOTAL COST of Circle			\$14,676.00

Flat Rd				
Make Ready				
22	Make ready (50% poles)	11	\$450.00	\$4,950.00
	Make Ready Total			\$4,950.00
Fiber Materials				
3132	Fiber	3759	\$0.95	\$3,571.05
	Attachment Hardware	3759	\$0.75	\$2,819.25
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	22	\$25.00	\$550.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
	Material Total			\$19,490.30
Fiber Installation				
	Fiber Installation	3759	\$1.50	\$5,638.50
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	22	\$50.00	\$1,100.00
	Anchor Installation, including anchor	22	\$175.00	\$3,850.00
	Fiber Splicing	5	\$500.00	\$2,500.00
	Labor Total			\$13,838.50
	TOTAL COST of Road			\$38,279.00

Greenwood Fiber Budget

Greenwood Rd				
Make Ready				
106	Make ready (50% poles)	53	\$450.00	\$23,850.00
Make Ready Total				\$23,850.00
Fiber Materials				
18927	Fiber	22713	\$0.95	\$21,577.35
	Attachment Hardware	22713	\$0.75	\$17,034.75
	Snowshoes for slack loops	14	\$80.00	\$1,120.00
	Down Guys and Guards	106	\$25.00	\$2,650.00
	Mux Box	14	\$800.00	\$11,200.00
	Fiber Splice Case	14	\$450.00	\$6,300.00
Material Total				\$107,582.10
Fiber Installation				
	Fiber Installation	22713	\$1.50	\$34,069.50
	Snowshoe install	14	\$150.00	\$2,100.00
	Guy Installation	106	\$50.00	\$5,300.00
	Anchor Installation, including anchor	106	\$175.00	\$18,550.00
	Fiber Splicing	14	\$500.00	\$7,000.00
Labor Total				\$67,019.50
TOTAL COST of Road				\$198,451.00

Howe Hill Rd				
Make Ready				
41	Make ready (50% poles)	21	\$450.00	\$9,450.00
Make Ready Total				\$9,450.00
Fiber Materials				
7503	Fiber	9004	\$0.95	\$8,553.80
	Attachment Hardware	9004	\$0.75	\$6,753.00
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	41	\$25.00	\$1,025.00
	Mux Box	5	\$800.00	\$4,000.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$41,881.80
Fiber Installation				
	Fiber Installation	9004	\$1.50	\$13,506.00
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	41	\$50.00	\$2,050.00
	Anchor Installation, including anchor	41	\$175.00	\$7,175.00
	Fiber Splicing	5	\$500.00	\$2,500.00
Labor Total				\$25,981.00

TOTAL COST of Road	\$77,313.00
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Rowe Hill Rd				
Make Ready				
72	Make ready (50% poles)	36	\$450.00	\$16,200.00
Make Ready Total				\$16,200.00
Fiber Materials				
11399	Fiber	13679	\$0.95	\$12,995.05
	Attachment Hardware	13679	\$0.75	\$10,259.25
	Snowshoes for slack loops	10	\$80.00	\$800.00
	Down Guys and Guards	72	\$25.00	\$1,800.00
	Mux Box	10	\$800.00	\$8,000.00
	Fiber Splice Case	10	\$450.00	\$4,500.00
Material Total				\$70,754.30
Fiber Installation				
	Fiber Installation	13679	\$1.50	\$20,518.50
	Snowshoe install	10	\$150.00	\$1,500.00
	Guy Installation	72	\$50.00	\$3,600.00
	Anchor Installation, including anchor	72	\$175.00	\$12,600.00
	Fiber Splicing	10	\$500.00	\$5,000.00
Labor Total				\$43,218.50
TOTAL COST of Road				\$130,173.00

Forrest Ln				
Make Ready				
16	Make ready (50% poles)	8	\$450.00	\$3,600.00
Make Ready Total				\$3,600.00
Fiber Materials				
3105	Fiber	3726	\$0.95	\$3,539.70
	Attachment Hardware	3726	\$0.75	\$2,794.50
	Snowshoes for slack loops	2	\$80.00	\$160.00
	Down Guys and Guards	16	\$25.00	\$400.00
	Mux Box	2	\$800.00	\$1,600.00
	Fiber Splice Case	2	\$450.00	\$900.00
Material Total				\$16,594.20
Fiber Installation				
	Fiber Installation	3726	\$1.50	\$5,589.00
	Snowshoe install	2	\$150.00	\$300.00
	Guy Installation	16	\$50.00	\$800.00
	Anchor Installation, including anchor	16	\$175.00	\$2,800.00
	Fiber Splicing	2	\$500.00	\$1,000.00
Labor Total				\$10,489.00

TOTAL COST of Road	\$30,683.00
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S Pond Shore Rd				
Make Ready				
17	Make ready (50% poles)	9	\$450.00	\$4,050.00
Make Ready Total				\$4,050.00
Fiber Materials				
4128	Fiber	4954	\$0.95	\$4,706.30
	Attachment Hardware	4954	\$0.75	\$3,715.50
	Snowshoes for slack loops	7	\$80.00	\$560.00
	Down Guys and Guards	17	\$25.00	\$425.00
	Mux Box	7	\$800.00	\$5,600.00
	Fiber Splice Case	7	\$450.00	\$3,150.00
Material Total				\$26,256.80
Fiber Installation				
	Fiber Installation	4954	\$1.50	\$7,431.00
	Snowshoe install	7	\$150.00	\$1,050.00
	Guy Installation	17	\$50.00	\$850.00
	Anchor Installation, including anchor	17	\$175.00	\$2,975.00
	Fiber Splicing	7	\$500.00	\$3,500.00
Labor Total				\$15,806.00
TOTAL COST of Road				\$46,113.00

Lakeview Ln				
Make Ready				
15	Make ready (50% poles)	8	\$450.00	\$3,600.00
Make Ready Total				\$3,600.00
Fiber Materials				
3328	Fiber	3994	\$0.95	\$3,794.30
	Attachment Hardware	3994	\$0.75	\$2,995.50
	Snowshoes for slack loops	3	\$80.00	\$240.00
	Down Guys and Guards	15	\$25.00	\$375.00
	Mux Box	3	\$800.00	\$2,400.00
	Fiber Splice Case	3	\$450.00	\$1,350.00
Material Total				\$18,354.80
Fiber Installation				
	Fiber Installation	3994	\$1.50	\$5,991.00
	Snowshoe install	3	\$150.00	\$450.00
	Guy Installation	15	\$50.00	\$750.00
	Anchor Installation, including anchor	15	\$175.00	\$2,625.00
	Fiber Splicing	3	\$500.00	\$1,500.00
Labor Total				\$11,316.00

TOTAL COST of Lane	\$33,271.00
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Log Cabin Ln				
Make Ready				
7	Make ready (50% poles)	4	\$450.00	\$1,800.00
Make Ready Total				\$1,800.00
Fiber Materials				
1432	Fiber	1719	\$0.95	\$1,633.05
	Attachment Hardware	1719	\$0.75	\$1,289.25
	Snowshoes for slack loops	2	\$80.00	\$160.00
	Down Guys and Guards	7	\$25.00	\$175.00
	Mux Box	2	\$800.00	\$1,600.00
	Fiber Splice Case	2	\$450.00	\$900.00
Material Total				\$9,357.30
Fiber Installation				
	Fiber Installation	1719	\$1.50	\$2,578.50
	Snowshoe install	2	\$150.00	\$300.00
	Guy Installation	7	\$50.00	\$350.00
	Anchor Installation, including anchor	7	\$175.00	\$1,225.00
	Fiber Splicing	2	\$500.00	\$1,000.00
Labor Total				\$5,453.50
TOTAL COST of Lane				\$16,611.00

Equipment to power the fiber:

Regen Cost				
	Pad Prep	1	\$2,500.00	\$2,500.00
	Power Installation	1	\$1,500.00	\$1,500.00
	Telco Cabinet/Telco Hut	1	\$15,000.00	\$15,000.00
	Switch - 192 ports	1	\$4,000.00	\$4,000.00
	Router	1	\$2,500.00	\$2,500.00
	CWDM SFP	125	\$45.00	\$5,625.00
	CDWM Mux	43	\$800.00	\$34,400.00
	UPS-Battery	2	\$6,000.00	\$12,000.00
	Fiber Patch Cable	125	\$10.00	\$1,250.00
	Generator	1	\$15,000.00	\$15,000.00
Total				\$93,775.00

Rumford Fiber Budget

River St				
Make Ready				
24	Make Ready (100% poles)	24	\$450.00	\$10,800.00
Make Ready Total				\$10,800.00
Fiber Materials				
3185	Fiber	3822	\$0.95	\$3,630.90
	Attachment Hardware	3822	\$0.75	\$2,866.50
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	24	\$25.00	\$600.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$31,347.40
Fiber Installation				
	Fiber Installation	3822	\$1.50	\$5,733.00
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	24	\$50.00	\$1,200.00
	Anchor Installation, including anchor	24	\$175.00	\$4,200.00
	Fiber Splicing	5	\$500.00	\$2,500.00
Labor Total				\$14,383.00

Lowell St				
Make Ready				
7	Make Ready (100% poles)	7	\$450.00	\$3,150.00
Make Ready Total				\$3,150.00
Fiber Materials				
801	Fiber	962	\$0.95	\$913.90
	Attachment Hardware	962	\$0.75	\$721.50
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	7	\$25.00	\$175.00
	Fiber Splice Case	1	\$450.00	\$450.00
Material Total				\$8,640.40
Fiber Installation				
	Fiber Installation	962	\$1.50	\$1,443.00
	Snowshoe install	1	\$150.00	\$150.00
	Guy Installation	7	\$50.00	\$350.00
	Anchor Installation, including anchor	7	\$175.00	\$1,225.00
	Fiber Splicing	1	\$500.00	\$500.00
Labor Total				\$3,668.00

Canal St				
Make Ready				
9	Make Ready (100% poles)	9	\$450.00	\$4,050.00
Make Ready Total				\$4,050.00
Fiber Materials				
934	Fiber	1121	\$0.95	\$1,064.95
	Attachment Hardware	1121	\$0.75	\$840.75
	Snowshoes for slack loops	3	\$80.00	\$240.00
	Down Guys and Guards	9	\$25.00	\$225.00
	Fiber Splice Case	3	\$450.00	\$1,350.00
Material Total				\$11,820.70
Fiber Installation				
	Fiber Installation	1121	\$1.50	\$1,681.50
	Snowshoe install	3	\$150.00	\$450.00
	Guy Installation	9	\$50.00	\$450.00
	Anchor Installation, including anchor	9	\$175.00	\$1,575.00
	Fiber Splicing	3	\$500.00	\$1,500.00
Labor Total				\$5,656.50

Bridge Crossing				
Make Ready				
2	Make Ready (100% poles)	2	\$450.00	\$900.00
Make Ready Total				\$900.00
Fiber Materials				
376	Fiber	564	\$1.50	\$846.00
	Attachment Hardware	564	\$0.75	\$423.00
	Snowshoes for slack loops	1	\$80.00	\$80.00
	Down Guys and Guards	2	\$25.00	\$50.00
	Fiber Splice Case	2	\$450.00	\$900.00
Material Total				\$4,099.00
Fiber Installation				
	Fiber Installation	564	\$10.00	\$5,640.00
	Snowshoe install	1	\$150.00	\$150.00
	Guy Installation	2	\$50.00	\$100.00
	Anchor Installation, including anchor	2	\$175.00	\$350.00
	Fiber Splicing	2	\$500.00	\$1,000.00
Labor Total				\$7,240.00

Franklin St				
Make Ready				
32	Make Ready (50% poles)	16	\$450.00	\$7,200.00
Make Ready Total				\$7,200.00
Fiber Materials				
4138	Fiber	4966	\$0.95	\$4,717.70
	Attachment Hardware	4966	\$0.75	\$3,724.50
	Snowshoes for slack loops	5	\$80.00	\$400.00
	Down Guys and Guards	32	\$25.00	\$800.00
	Fiber Splice Case	5	\$450.00	\$2,250.00
Material Total				\$26,292.20
Fiber Installation				
	Fiber Installation	4966	\$1.50	\$7,449.00
	Snowshoe install	5	\$150.00	\$750.00
	Guy Installation	32	\$50.00	\$1,600.00
	Anchor Installation, including anchor	32	\$175.00	\$5,600.00
	Fiber Splicing	5	\$500.00	\$2,500.00
Labor Total				\$17,899.00