GRN-001212 Budget Narrative – Updated

Applicant Name: **Horizon Telcom**

Applicant Type: Telecommunications Company

Proposed Period of Performance: 4 Years

Total Project Costs:	$48,275,817.00
Total Federal Grant Request:	$27,540,553.83
Total Matching Funds (Cash):	$15,655,303.17
Total Matching Funds (In-Kind):	$ 5,079,960.00
Total Matching Funds (Cash + In-Kind):	$20,735,263.17

Total Matching Funds (Cash + In-Kind) as Percentage of Total Project Costs: 42.9517%

Fiscally Sustainable Middle Mile Strategy

Horizon, a 125-year-old telecommunications company, has built extensive partnerships with community anchor institutions (CAIs), Internet Service Providers (ISPs) and mobile operators to sustain its 2,000-mile middle mile network in rural Ohio. Our middle mile network currently connects nearly one thousand CAIs in the K-12, healthcare, government, and higher education arenas.

The proposed project builds upon the NTIA's 2010 investments in the Ohio Middle Mile Consortium (OMMC). The Horizon design includes 239 miles of new fiber that will:

a. Traverse largely unserved counties with no existing open middle mile,
b. Close multiple rings in the existing network to improve reliability, and
c. Create additional interconnection points among the original OMMC members.

In addition, the requested funding would upgrade the electronics across the existing network, providing a 40-fold increase in speeds. To support our CAI partners, we also propose to establish three rings, each operating at 400 Gbps, dedicated to the healthcare, K-12 and higher education communities.

Together, these improvements along with the new fiber would enhance services to CAIs, ISPs and mobile carriers, extending Horizon's position as the sole open middle mile provider serving Appalachian Ohio. Based on modest market penetration projections, the proposed project would become both EBITDA and Net Income positive in Year 4.

[redacted]

Middle Mile Progression

Horizon's initial expansion into middle mile services focused on thirteen southern Ohio counties in partnership with the Southern Ohio Health Care Network (SOHCN). The $30 million project included $16 million from the FCC Rural Health Care Pilot Program, $10 million from Horizon and $4 million from the SOHCN. The SOHCN network now connects 300+ healthcare facilities.

To compete in the NTIA Broadband Technology Opportunity Program, Horizon's successful proposal extended the reach of the SOHCN but also partnered with K-12 Information Technology Centers (ITCs) and Councils of Government (COGs). The resulting $100 million fiber build expanded Horizon's footprint to an additional twenty-one counties supported with $66 million from the NTIA.

Horizon's partnerships with community anchor institutions (CAIs) resulted in a healthy financial return on what were, at the time, risky investments. Some involved wondered if we'd embarked on a "fiber-to-the-cow" initiative. Instead, the CAIs embraced the availability of high-performance fiber networks,

with monthly costs for many subsidized through the FCC E-Rate or Healthcare Connect Fund programs. Hundreds of K-12 schools previously out of reach, now enjoy fiber connectivity through Horizon's middle mile. Further bolstering the financial sustainability, mobile carriers accelerated their deployments in Appalachian Ohio due to the availability of Horizon's fiber back-haul capabilities. Now with 200+ fiber-fed towers, the existing middle mile improves access throughout the region as well as providing another key source of revenue.

For the last mile, numerous small ISPs have deployed both fixed wireless and fiber-to-the-home infrastructure by tapping into Horizon's fiber network for back-haul. Five of these ISPs have provided letters of support expressing their intent to expand their networks and improve existing connectivity based on Horizon's proposed middle mile expansion. Horizon also leverages its own middle mile to support last mile projects. Horizon has identified a total of 110 towns of interest in the proposed service area. We are careful, though, to maintain strong relationships with small ISPs in Appalachian Ohio to maximize the overall progress in expanding broadband availability.

Key Financial Sustainability Aspects of the Proposed Project

Horizon proposes a cost-effective approach for closing key gaps in open middle mile infrastructure in Appalachian Ohio by building upon the NTIA's 2010 investments in the Ohio Middle Mile Consortium (OMMC). The proposed design constructs 239 miles of fiber to reach two counties currently lacking any open middle mile, establishes new POPs in three counties, and densifies the existing network in six additional counties.

As part of this proposal, Horizon proposes to deploy 400 Gbps, physically diverse rings to support each of these three key CAI sectors. These rings will utilize 12 strands of fiber on both existing and proposed fiber routes, covering a total of 817 route miles. The upgraded points-of-presence along with use of 711 miles of existing Horizon fiber will enable us to deliver this significant connectivity upgrade to the CAIs. 437 miles of this existing fiber were funded by a 2010 NTIA BTOP grant and thus are excluded as in-kind match. 274 miles were privately funded by Horizon and thus are included as in-kind match. Horizon's commitment to the CAIs not only benefits the region but also cements our position as the "go-to" provider for the crucial broadband customers, critical to the long-term sustainability of the middle mile network.

The proposed new fiber will pass within 1,000 feet of 16,257 households, 525 CAIs (57 of which are unserved), 2,114 businesses, and 287 towers. Our pro forma forecasts a relatively modest 45% market penetration for CAIs and medium-to-large businesses and towers, and 25% of small businesses served with lit services. These modest assumptions on market penetration and rates for service yield a positive financial picture with both EBITDA and Net Income going positive in Year 4 as summarized in the following table and detailed in the Income Statement.

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Foundation of the Horizon Budget and Figures Referenced Elsewhere in the Budget Narrative

In this section, Horizon provides cost projections in the same way in which we calculate project costs. We have mapped the costing information to the SF-424C categories for easy reference. The figures are drawn from experience by Horizon based on successful expansion projects in Ohio, adjusted for recent inflationary impacts.

For the new aerial fiber builds, Horizon will install 288-strand or higher count cables. Horizon will install splice points and slack loops strategically along the routes to support interconnection with last-mile providers and CAIs. The splicing will be a combination of:

- Through splices along a continuous route,
- Splicing to terminal tails for local access, and
- Splicing for locations in which a route forks in two or more directions.

Testing will involve OTDR traces for every strand with results provided, which Horizon reviews and approves before signing off on each splice. Additional visual spot checks by Horizon will verify the contractor's work, including proper case closure and sealing or no improper bend radiuses. We have budgeted a cost of $50.56 per aerial strand mile for splicing and testing, resulting in a total of $14,560 per mile ($50.56 per mile * 288 strands). The actual number of splices and types of splices will vary mile-by-mile based on the density of CAIs, households, and businesses in the vicinity.

The average cost of a fusion splice in our budget is $24. The remainder of the splicing costs include set-up labor required to prepare splice cases, re-mounting them when completed and testing.

Fiber and Make-Ready Per Mile				SF-424C Category
	Engineering	$	10,400	4
	Permits/Easements	$	2,080	2
	Materials	$	31,200	9
	Construction	$	41,600	9
	Splicing/Testing	$	14,560	9
	Project Mgt	$	4,160	6
	Total	**$**	**104,000**	

Figure 1: Aerial Fiber Costs and SF-424C Allocations

The cost of make-ready, i.e. preparing existing utility poles for fiber attachment, have been averaged to $40,000 per mile, built into the costs in Figure 1. The actual costs will vary from mile-to-mile based on the condition of the existing utility poles for the specific route. Due to the rugged terrain and old poles,

it is not unusual to incur replacement of half or more of the poles, averaging 8 to 12 pole replacements per mile, sometimes higher. While a large expense, the effort does improve overall grid resiliency.

For the new underground fiber builds, Horizon will install 384-strand or higher count cables. Horizon will install splice points and slack loops strategically along the routes to support interconnection with last-mile providers and CAIs. The splicing will be a combination of:

- through splices along a continuous route,
- splicing to terminal tails for local access, and
- splicing for locations in which a route forks in two or more directions.

Testing will involve OTDR traces for every strand with results provided, which Horizon reviews and approves before signing off on each splice. Additional visual spot checks by Horizon will verify the contractor's work, including proper case closure and sealing or no improper bend radiuses. We have budgeted a cost of $61.13 per underground strand mile for splicing and testing, resulting in a total of $23,472 per mile ($61.13 per mile * 384 strands). The actual number of splices and types of splices will vary mile-by-mile based on the density of CAIs, households, and businesses in the vicinity. Underground splice costs are projected to be higher than aerial due to the likelihood that underground routes will be located in more densely populated areas requiring more "off ramps."

The average cost of a fusion splice in our budget is $24. The remainder of the splicing costs include set-up labor required to prepare splice cases, re-mounting them when completed and testing.

In Figure 2, Horizon provides cost estimates for underground deployment. Horizon has extensive experience with underground fiber construction. Given the intent to attain high reliability, middle mile fiber installed underground must be built at depths of 36" or deeper and placed in schedule 40 conduit. In the targeted counties, the prevalence of near-surface rock is high but often undetectable during field engineering. Based on past experience in similar terrain, we anticipate encountering rock on an average 40% of the routes. To achieve the desired 36+" depth for the conduit, installation will require rock-adder trenching which costs significantly more per foot than normal excavation.

Fiber Per Mile - Underground			SF-424C Category
	Engineering	$ 19,560	4
	Permits/Easements	$ 7,824	2
	Materials	$ 58,680	9
	Construction	$ 78,240	9
	Splicing/Testing	$ 23,472	9
	Project Mgt	$ 7,824	6
Total for Underground at 40% Rock		**$ 195,600**	

Figure 2: Underground Fiber Costs and SF-424C Allocations

Figure 3 explains the cost impact of such rock encounters at different percentages. Routine underground installation would cost $90,000 per mile, including directional drilling to minimize road disturbances. When rock is encountered, the costs ramp up quickly. Rock adder trenching adds, in our experience, an additional $50 per foot.

Rock Prevalance Along Route - Financial Impact					
	Rock prevalance	10%	25%	**40%**	60%
	Base Underground*	$ 90,000	$ 90,000	**$ 90,000**	$ 90,000
	Increase per Mile**	$ 26,400	$ 66,000	**$ 105,600**	$ 158,400
Projected Underground Costs		$ 116,400	$ 156,000	**$ 195,600**	$ 248,400
*Includes $10 to $12 per foot for directional drill					
**Per Foot Addition for encountering rock at $50 per foot for rock adder					

Figure 3: Rock Impact on Underground Fiber Costs

In Figure 2, we estimate the cost of underground deployment based on encountering rock in 40% of the route. Figure 3 explains the cost impact of such rock encounters at different percentages.

Site and Site Selection				SF-424C
	Site Selection and Negotiation	$	6,000	1
	Easement Negotiation	$	4,000	1
	Title Report and Title Curative Work	$	2,000	1
	Zoning	$	5,000	1
	Local Permits for Placement of POP	$	2,000	1
	Perpetual Easement	$	65,000	2
Civil Engineer				
	Surveys, Site Planning	$	9,000	4
	Utility Planning: Electrical and Natural Gas	$	3,000	4
Shelter Provider				
	State Approval and Inspection	$	2,000	4
	Building including HVAC, Power Distribution, Lighting	$	60,000	2
	Building Freight	$	5,000	2
	Generator and Transfer Switch	$	30,000	2
	Generator and Transfer Switch Freight		Included	2
	Start-Up of Generator by Manufacturer Certified Tech		Included	2
Construction Company				
	Site Preparation (Grading, Footer, Slab, Fence)	$	20,000	7
	Handholes for Fiber Entry (2)	$	8,000	7
	POP Security	$	12,000	7
	Offloading Building	$	6,000	7
	Installation and Tie-Down of Building	$	12,000	7
	Offloading Generator	$	3,000	7
	Tie-Down of Generator	$	3,000	7
Electrical Contractor				
	Generator and Transfer Switch Installation	$	9,000	9
	Establish and Test Ground Field, Extend into Building	$	5,000	9
	Electrical Service (Feed to building, hook up, turn-up)	$	15,000	9
Fiber Contractor for Physically Diverse Feeds				
	Engineer Fiber Extensions (2)	$	15,000	9
	Pole Applications	$	3,000	9
	Fiber Construction (2)	$	220,000	9
	Fiber Termination (288 Fiber x 2)	$	24,000	9
Electronics				
	Rectifer, Breaker, Fuse Panel, Batteries	$	25,000	2
	Equipment Racks (4)	$	4,000	2
	Fiber Management for Racks	$	3,000	2
	Ciena DWDM Platform	$	352,000	2
	Misc-Power Cable, Fuses, etc…	$	6,000	2
	Labor 8-10 Days for install and Turn-up	$	18,000	2
New POP Total		**$**	**956,000**	

Figure 4: Establishing a New POP Costs and SF-424C Allocations

1. Administrative and legal expenses **$57,000.00**

All of the costs allocated by Horizon to this category are related to establishing new POPs, as detailed in Figure 4 and below.

		Unit Type	Unit Cost	No. of Units	Total Cost
1. Administrative and Legal Expenses					
New POPs	Site Selection and Negotiation	Other	$ 6,000	3	$ 18,000
New POPs	Easement Negotiation	Other	$ 4,000	3	$ 12,000
New POPs	Title Report and Title Curative Work	Other	$ 2,000	3	$ 6,000
New POPs	Zoning	Other	$ 5,000	3	$ 15,000
New POPs	Local Permits for Placement of POP	Other	$ 2,000	3	$ 6,000
Total Administrative and Legal Expenses					**$ 57,000**

2. Land, structures, rights-of-way, appraisals, etc. $6,408,888.00

The costs allocated by Horizon to this category fall into three categories:

a. Aerial Fiber as detailed in Figure 1 and below.

b. Underground Fiber as detailed in Figure 2 and Figure 3 and below.

c. New POPs as detailed in Figure 4 and below.

		Unit Type	Unit Cost	No. of Units	Total Cost
2. Land, Structures, Rights-of-Way, Appraisals, etc.					
Aerial Fiber	Permits/Easements	Mile	$ 2,080	207	$ 430,560
Underground Fiber	Permits/Easements	Mile	$ 7,824	32	$ 250,368
New POPs	Perpetual Easement	Other	$ 65,000	3	$ 195,000
New POPs	Building including HVAC, Power Distribution, Lighting	Other	$ 60,000	3	$ 180,000
New POPs	Building Freight	Other	$ 5,000	3	$ 15,000
New POPs	Generator and Transfer Switch	Other	$ 30,000	3	$ 90,000
New POPs	Rectifer, Breaker, Fuse Panel, GMT, Batteries	Other	$ 25,000	3	$ 75,000
New POPs	Equipment Racks (4)	Other	$ 4,000	3	$ 12,000
New POPs	Fiber Management for Racks	Other	$ 3,000	3	$ 9,000
New POPs	Misc-Power Cable, Fuses, etc...	Other	$ 6,000	3	$ 18,000
New POPs	Labor 8-10 Days for install and Turn-up	Other	$ 18,000	3	$ 54,000
IRUs	Strands on Existing Fiber for Community Benefit Rings	Mile	$ 18,540	274	$ 5,079,960
Total Land, Structures, Rights-of Way, Appraisals, etc.					**$ 6,408,888**

d. Indefeasible Rights to Use (IRUs) which account of the 12-strands of fiber allocated by Horizon on existing routes for "community benefit rings" with 4 strands allocated to OARnet (Ohio's NREN), 4 strands allocated to K-12 Information Technology Centers and 4 strands allocated to the Southern Ohio Health Care Network. We valued the strands at $1,545 per strand mile. With 274 miles of existing non-NTIA-funded routes * 12 strands = 3,288 strand miles * $1,545 per strand = $5,079,960. Calculated on a per mile basis, the cost is 12 strands * $1,545 per strand = $18,540 per route mile.

This valuation of the IRUs is on the low-end of the market in rural Ohio. The Southern Ohio Health Care Network conducted an analysis in 2020 that arrived at an average IRU cost of $3,251 per strand mile for a 20-year IRU. American Electric Power prices 12-strands of IRU in Ohio at $1,558 per strand mile for a 20-year IRU when purchased in 12-strand quantities.

Horizon's valuation for this proposal at $1,545 per strand mile is thus at the low-end of the market.

3. **Relocation expenses and payments** **$0.00**

4. **Architectural and engineering fees** **$2,829,720.00**

The costs allocated by Horizon to this category fall into three categories:

a. Aerial Fiber as detailed in Figure 1 and below.

b. Underground Fiber as detailed in Figure 2 and Figure 3 and below.

c. New POPs as detailed in Figure 4 and below.

		Unit Type	Unit Cost	No. of Units	Total Cost
Aerial Fiber	Engineering	Mile	$ 10,400	207	$ 2,152,800
Underground Fiber	Engineering	Mile	$ 19,560	32	$ 625,920
New POPs	Surveys, Site Planning	Other	$ 9,000	3	$ 27,000
New POPs	Utility Planning: Electrical and Natural Gas	Other	$ 3,000	3	$ 9,000
New POPs	State Approval and Inspection	Other	$ 2,000	3	$ 6,000
New POPs	Pole Applications	Other	$ 3,000	3	$ 9,000
Total Architechtural and Engineering Fees					**$ 2,829,720**

5. **Other architectural and engineering fees** **$0.00**

6. **Project inspection fees** **$1,111,488.00**

The costs allocated by Horizon to this category fall into two categories:

a. Aerial Fiber as detailed in Figure 1 and below.

b. Underground Fiber as detailed in Figure 2 and Figure 3 and below.

		Unit Type	Unit Cost	No. of Units	Total Cost
Aerial Fiber	Project Mgt	Mile	$ 4,160	207	$ 861,120
Underground Fiber	Project Mgt	Mile	$ 7,824	32	$ 250,368
Total Project Inspection Fees					**$ 1,111,488**

7. Site work **$192,000.00**

All of the costs allocated by Horizon to this category are related to establishing new POPs, as detailed in Figure 4 and below.

		Unit Type	Unit Cost	No. of Units	Total Cost
New POPs	Site Preparation (Grading, Footer, Slab, Fence)	Other	$ 20,000	3	$ 60,000
New POPs	Handholes for Fiber Entry (2)	Other	$ 8,000	3	$ 24,000
New POPs	POP Security	Other	$ 12,000	3	$ 36,000
New POPs	Offloading Building	Other	$ 6,000	3	$ 18,000
New POPs	Installation and Tie-Down of Building	Other	$ 12,000	3	$ 36,000
New POPs	Offloading Generator	Other	$ 3,000	3	$ 9,000
New POPs	Tie-Down of Generator	Other	$ 3,000	3	$ 9,000
Total Site Work					**$ 192,000**

8. **Demotion and removal** **$0.00**

9. Construction **$34,992,064.00**

The costs allocated by Horizon to this category fall into four categories:

a. Aerial Fiber as detailed in Figure 1 and below.

b. Underground Fiber as detailed in Figure 2 and Figure 3 and below.

c. New POPs as detailed in Figure 4 and below.

d. Upgrades of existing POPs to 400 Gbps capacity. These proposed upgrades target POPs originally funded by the NTIA in the BTOP program. Initially equipped with 10 Gbps per wavelength DWDM equipment, we now propose to replace this 10–12-year-old equipment with new Ciena DWDM equipment supporting speeds of up to 400 Gbps per wavelength.

		Unit Type	Unit Cost	No. of Units	Total Cost
Aerial Fiber	Materials	Mile	$ 31,200	207	$ 6,458,400
Aerial Fiber	Construction	Mile	$ 41,600	207	$ 8,611,200
Aerial Fiber	Splicing/Testing	Mile	$ 14,560	207	$ 3,013,920
Underground Fiber	Materials	Mile	$ 58,680	32	$ 1,877,760
Underground Fiber	Construction	Mile	$ 78,240	32	$ 2,503,680
Underground Fiber	Splicing/Testing	Mile	$ 23,472	32	$ 751,104
New POPs	Generator and Transfer Switch Installation	Other	$ 9,000	3	$ 27,000
New POPs	Establish and Test Ground Field, Extend into Building	Other	$ 5,000	3	$ 15,000
New POPs	Electrical Service (Feed to building, hook up, turn-up, etc…)	Other	$ 15,000	3	$ 45,000
New POPs	Engineer Fiber Extensions (2)	Other	$ 15,000	3	$ 45,000
New POPs	Fiber Construction (2)	Other	$ 220,000	3	$ 660,000
New POPs	Fiber Termination (288 Fiber x 2)	Other	$ 24,000	3	$ 72,000
New POPs	Ciena DWDM Platform	Other	$ 352,000	3	$ 1,056,000
POP Upgrades	Ciena DWDM Platform	Other	$ 352,000	28	$ 9,856,000
Total Construction					**$ 34,992,064**

10. **Equipment** **$0.00**

As an existing ISP operating in the service area, we do not anticipate requiring equipment beyond what we currently utilize.

11. **Miscellaneous** **$0.00**

12. SUBTOTAL **$45,591,160.00**

Horizon's subtotal represents an accurate project cost summary.

13. Contingencies **$2,684,657**

Horizon elected to apply a modest 5% contingency because of our significant experience in similar projects.

14. SUBTOTAL **$48,275,817.00**

Horizon's subtotal represents an accurate project cost summary.

15. Project (program) income **$0.00**

Horizon has not included projected income during the period of performance. If awarded, Horizon will offset operational costs (not included in grant budget) with project income.

16. TOTAL PROJECT COSTS **$48,275,817.00**

Horizon's Total Project Costs represents an accurate project cost summary.

17. Federal assistance requested **$27,540,553.83**

Horizon's Federal assistance requested equals 42.9517% of the total project costs.