



Budget Narrative

Applicant Name: Mid-Atlantic Broadband Cooperative

EasyGrants Number: 972

Organization Type (from Question 1D on BTOP application):
Cooperative

Proposed Period of Performance: Complete by the end of the 3rd year from the award date.

Total Project Costs: \$20,055,363

Total Federal Grant Request: \$16,044,290

Total Matching Funds (Cash): \$4,011,073

Total Matching Funds (In-Kind): \$0

Total Matching Funds (Cash + In-Kind): \$4,011,073

Total Matching Funds (Cash + In-Kind) as Percentage of Total Project Costs: 20%

1. Administrative and legal expenses

- No expenses of this type

2. Land, structure, rights-of-way, appraisals, etc.

- Node Shelter – MBC's current network has 22 nodes strategically placed through its network. These shelters contain the fiber optic transport equipment. The extensions of the fiber backbone network required to support this project will require four additional nodes to house the transport equipment. The unit cost is based on current vendor pricing. Shelters are not available for leasing and are considered to be a permanent fixed asset for its service life.



- Based on current vendor pricing, each shelter costs \$75,000 for a total cost of \$300,000.
- Each node shelter requires a 30 kW generator to provide backup AC power in the event of a commercial power failure to ensure the network remains operational.
- Based on current vendor pricing, each generator costs \$25,000 for a total cost of \$100,000.
- The unit cost is based on current vendor pricing. This equipment is not available for leasing and is considered to be a permanent fixed asset for its service life.
- The grant application requests 80% funding for this category, or \$320,000. MBC will provide \$80,000 in matching funds, or 20% of the total required funding.

3. Relocation expenses and payment

- No expenses of this type expected.

4. Architectural and engineering fees

- OSP Engineering fees: In order to construct the proposed 465 mile fiber route, detailed OSP engineering plans must be developed. MBC uses contract engineering firms to produce these construction drawings, and to apply for all necessary easements for the node structures, and public right-of-way and railroad permits. The estimated cost for this project was based on an historical ratio of engineering costs to OSP construction and transport costs.
- Using the historical factor of 10.393513% applied to the equipment and OSP construction estimated cost of \$16,296,655, the estimated OSP Engineering fees will be \$1,693,795.
- The grant application requests 80% funding for this category, or \$1,355,036. MBC will provide \$338,759 in matching funds, or 20% of the total required funding.



5. Other architectural and engineering fees

- No expenses of this type expected.

6. Project inspection fees

- In order to ensure that the project is planned, engineered, and constructed in a quality and timely manner, MBC will be required to engage project managers and project inspectors. The cost of these resources is based on an historical percentage of overall construction and equipment costs. Personnel performing these tasks will be a combination of MBC employees and contractors.

-Using the historical factor of 9.18847% applied to the equipment and OSP construction estimated cost of \$16,296,655, the estimated Project Inspection fees will be \$1,497,413.

-The grant application requests 80% funding for this category, or \$1,197,930. MBC will provide \$299,483 in matching funds, or 20% of the total required funding.

7. Site work

- Each node described in Land & Structures requires site preparation consisting of minor grading, driveway and parking conditioning, etc. The unit cost is based on MBC historical averages. The work will be performed by MBC contractors.

- Based on MBC historical averages, each node requires an estimated \$25,000 in site preparation work before the node can be placed on site.

-The grant application requests 80% funding for this category, or \$80,000. MBC will provide \$20,000 in matching funds, or 20% of the total required funding.

8. Demolition and removal

- No expenses of this type expected on this project.



9. Construction

- Below are the components of the estimated cost of OSP construction.

144 Fiber Cable	Foot	\$1.45	460,135	\$667,196
96 Fiber Cable	Foot	\$1.07	1,129,422	\$1,208,482
48 Fiber Cable	Foot	\$0.58	501,965	\$291,140
24 Fiber Cable	Foot	\$0.47	363,256	\$170,731
Hand holes	Each	\$649.00	581	\$377,069
Pole Line Hardware/Strand	Foot	\$0.41	530,232	\$217,395
Cable Route Markers	Each	\$21.10	3,777	\$79,695
Splice Cases Small	Each	\$320	209	\$66,880
Splice Cases Large	Each	\$475	157	\$74,575
Buried Cable Placement	Foot	\$4.89	1,924,546	\$9,411,030
Aerial Cable Placement	Foot	\$3.19	530,232	\$1,691,440
Splicing Labor	Each	\$971.30	487	\$473,023
				\$14,728,655

-The fiber cable line items constitute the fiber cable strand sizes that will be constructed along the 465 route miles. The fibers sizes are based on route topology requirements with 144 strand fibers along primary backbone routes tapering in size on secondary routes to smaller strand counts down to 24 strand which will be placed to the individual schools and admin buildings. The cost per foot was calculated based on current vendor pricing.



-Hand holes are required at strategic locations such as major intersections and at all splice points where cable is coiled in the hand hole below the surface to provide access to the fiber cable. Unit cost was based on current vendor pricing.

-Pole line hardware/strand – For the aerial route segments, 6M support strand is required to which the fiber is lashed, and each pole requires DA bolts, 3 bolt clamps, and other hardware to support the cable and strand. For cost estimating purposes, this is typically calculated on a linear foot cost basis based on past build costs.

- Cable route markers are required to prevent damage to underground facilities. Typically markers are placed at all hand holes, and at other strategic locations where potential excavation may occur. Unit cost was based on current vendor pricing.

-Splice cases – small are required where ever there is a fiber splice required on lower strand count fiber cables. Unit cost was based on current vendor pricing

-Splice cases – large are required where ever there is a fiber splice required on higher strand count fiber cables. Unit cost was based on current vendor pricing.

-Buried cable placement – this cost represents an average historical cost for buried fiber cable placement on a per linear foot basis. The work will be performed by MBC contract construction crews.

-Aerial cable placement – this cost represents an average historical cost for aerial fiber cable placement on a per linear foot basis. The work will be performed by MBC contract construction crews.

-Splicing labor represents an average cost per splice based on historical averages. Examples of splice locations are at reel ends, cuts where some road crossings are made, and at customer locations. The work will be performed by MBC contract splicing crews.

All physical components placed during construction would be purchased assets; telecom components of this type are not available for lease.

The grant application requests 80% funding for this category, or \$11,782,924. MBC will provide \$2,945,731 in matching funds, or 20% of the total required funding.



10. Equipment

-Below is a list of the equipment proposed on this project:

Nortel Optical MultiService Edge 6500	Each	\$79,405	6	\$476,430
Nortel Optical MultiService Edge 6100	Each	\$7,900	121	\$955,900
DC Power System	Each	\$2,450	4	\$9,800
NSB 170 Ah Batteries	Each	\$305.64	32	\$9,780
DC-AC Inverter	Each	\$2,500	4	\$10,000
Nortel Ethernet Router	Each	\$3,793.75	4	\$15,175
AFL 144 Fiber Panel	Each	\$625	2	\$1,250
AFL 96 Fiber Panel	Each	\$475	5	\$2,375
SC Fiber Jumpers	Each	\$60	20	\$1,200
Installation Labor for Nortel 6500s	Each	\$2,450	6	\$14,700
Installation Labor for Nortel 6100s	Each	\$590.00	121	\$71,390
				\$1,568,000

-The Nortel 6500s are required in the four proposed node shelters where the MBC fiber backbone is being extended as part of this project, and in two existing nodes where there are currently no electronics. The 6500s are the electronics required to carry traffic across the fiber cables. Each 6500 will contain optical cards and multiplexing cards that allow for dropping of services in the local loop, and for protecting services through SONET ring technology. This equipment is not available for leasing and is considered to be a permanent fixed asset for its service life.

-The Nortel 6100s will be installed at each school or administration building. This unit will provide the optical to electrical conversion for handoff to the school on a CAT5 cable (s). This equipment is not available for leasing and is considered to be a permanent fixed asset for its service life.

-DC power systems are required to convert the input AC power to DC power at the four new nodes. The Nortel 6500 units run on -48 volts DC, so the DC power systems are required to convert 220 volts AC to -48 volts DC. This equipment is



not available for leasing and is considered to be a permanent fixed asset for its service life.

-Eight batteries are required at each node location for DC power backup. Even though each node will have generator backup for AC power, batteries are required since when there is a commercial power failure, there is a momentary interruption of AC power when the switch to generator is made. If there is no battery backup available, all the Nortel equipment resets itself causing an eight minute service outage. The batteries also provide a measure of backup time in the event of generator failure during a commercial power outage. This equipment is not available for leasing and is considered to be a permanent fixed asset for its service life.

-DC-AC inverter is required to power the site router. Since the router is a critical network component and is AC powered, to prevent service interruption in a commercial power failure, the AC power is provided through the DC power system and the DC-AC inverter. If the Inverter were not present, the router would be subject to reset and subsequent service interruption whenever there was a commercial power failure. This equipment is not available for leasing and is considered to be a permanent fixed asset for its service life.

-Nortel Ethernet Routers – one unit is needed at each node for network management and communication purposes

-AFL 144 Fiber Panel – one of the proposed nodes will require two 144 fiber panels for fiber termination, and three of the proposed nodes will require a total of five 96 fiber panels for fiber termination.

-SC fiber jumpers are needed to connect the OSP fiber cables that are terminated on the panels in the nodes to the Nortel optical shelves.

-Installation Labor for Nortel 6500s – cost for installing testing and turning up the Nortel 6500 units in the four new nodes, and the two existing nodes that currently don't have them.

-Installation Labor for Nortel 6100s – cost for installing the 121 Nortel 6100 units at each school or admin building

-All physical components placed during construction would be purchased assets; telecom components of this type are not available for lease.

-The grant application requests 80% funding for this category, or \$1,254,400. MBC will provide \$313,600 in matching funds, or 20% of the total required funding.



11. Miscellaneous

- Below are items included as miscellaneous expenses:

Vehicles	Each	\$20,000	3	\$60,000
Computers	Each	\$1,500	3	\$4,500
Desks/Furnishings	Each	\$1,000	3	\$3,000
		0	0	\$0
		0	0	\$0
				\$67,500

- MBC will be adding three full time employees for this project, and each will require a vehicle to manage the construction aspect of the project. The project manager and the two inspectors will be required to visit construction sites and contractor locations across the network footprint on a regular basis. These visits to construction sites will be for quality and progress inspections to ensure that the fiber optic cables are being constructed to MBC standards and to ensure that no OSHA or VDOT regulations are being violated. The project manager will be required to meet regularly with construction contractors for reviewing and coordinating project schedules and the ongoing management of milestones. The three vehicles will be used for the exclusive and express purpose of ensuring that the construction performed on this project is done in a quality manner and meets all prescribed deadlines. Consideration was given to leasing instead of purchasing the vehicles, but the anticipated high mileage requirement would make purchase the more economical choice. The length and breadth of this project covers almost 9,000 square miles across Southern Virginia which will lead to extensive miles being put on the vehicles. The cost basis for the vehicles is based on average new mid-sized vehicle.

-Each new employee will require a new computer and is based on current vendor pricing.

-Each new employee will require office furniture for his or her work space; cost basis is current vendor pricing estimate.

-The grant application requests 80% funding for this category, or \$54,000. MBC will provide \$13,500 in matching funds, or 20% of the total required funding.



Addendum

- N/A