



**Broadband Technology Opportunities Program (BTOP)  
Comprehensive Community Infrastructure (CCI) Grant Application**

**Colorado Community Anchors Broadband Consortium (CCABC)  
Connecting Colorado's Middle Mile  
Round 2 Middle Mile Project**

The CCABC Connecting Colorado's Middle Mile Round 2 BTOP application provides high-speed broadband services to Community Anchor Institutions in Colorado including 178 K-12 School Districts, 15 Community Colleges, 26 Libraries, 12 BOCES, and 3 institutions of higher education. The Network (operated as EAGLE-Net) will pass through 177 Colorado communities and will provide the opportunity to expand service to as many as 3,000 to 4,000 additional Community Anchor locations.

Community Anchors will initially be offered 20 Mbps to 1 Gbps broadband service that can be used to access the Internet/Internet2 as well as any other IP-based service. With growth capacity to 10 Gbps and higher, EAGLE-Net will enhance services for education, research, healthcare delivery, workforce development, and public safety. Wholesale services are expected to stimulate the offering of affordable broadband access for more than 1.6 million households and more than 50,000 businesses.

The Middle Mile network architecture includes core facilities provided by Qwest and Level 3. Anchor institutions will be connected to the statewide network through a combination of RF Microwave and fiber optic connections constructed and maintained by BNI, Conterra and Adesta. EAGLE-Net adheres to the Nondiscrimination and Interconnection Policies contained in the FCC's Broadband Policy Statement for the provision of equal access to broadband backhaul capacity. This positions rural local exchange carriers and cellular providers with the ability to expand their service offerings due to lower cost backhaul provided by EAGLE-Net.

*Public and Private Collaboration Entities:*

ADCOM 911, Adesta, LLC, BNI, Bresnan, Cisco, Colorado Association of School Boards, Colorado Association of School Executives, Colorado Board of Cooperative Services Association, Colorado Community Colleges, Colorado Department of Education, Colorado Department of Public Safety, Colorado Department of Labor and Employment, Colorado Education Association, Colorado Governor's Office of Information Technology, Colorado Regional Health Information Organization, Colorado Online Learning, Colorado State Library, Colorado State University, Colorado Tele-Health Network, Comcast, Comfluent, Conterra, Denver Museum of Natural History, El Pomar Foundation, Front Range GigaPoP, IBM, KCI, Level 3, Longmont Power & Communications, Open Range Communications, PacketRail, PC Telecom, Pinpoint Communications, Plains Telephone Cooperative, Platte River Power Authority, Reliance Globalcom, Qwest, SECOM, State Internet Portal Authority, Sun Wireless, tw telecom, UNITE Private Fiber Networks, University of Colorado, University of Northern Colorado, University of Wyoming, US Cable, Viaero, & Zayo Bandwidth.



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- The State recognizes the value of public, private and government collaboration. The success and sustainability of a Comprehensive Community Infrastructure Application for Colorado includes the contributions of public assets in the form of access and infrastructure investments previously made. Therefore, Colorado will permit access to Community Anchor Institutions on the existing transportation department fiber infrastructure, rights of way, and allow for utilization of design and engineering plans as an in-kind match valued at \$9 Million. Reciprocal access to the network for transportation department needs will be provided via the EAGLE-Net, Comprehensive Community Anchor Infrastructure project.
- Sustainability of a statewide broadband project is dependent on leadership, implementation and funding. The CCABC EAGLE-Net Broadband Technology Opportunities Program (BTOP) Grant Application is supported by an Intergovernmental Agreement with leadership across the state in diverse areas such as Education, Health-care, Public Safety and Municipalities. The Project will be managed by a public-private partnership with more than 200 years of combined telecommunications expertise. Ongoing revenue projections show that the organization will be fully sustainable by the end of the 36 month grant application period.
- The purpose of the BTOP funds was to build broadband access in areas in which economic forces weren't sufficient to encourage private investment. Sustainability can be achieved at a lower TCO by a Not For Profit because they can aggregate demand and implement cost sharing programs to leverage buying power for advanced service offerings.
- The Recovery Act provided a total of \$7.2 billion to NTIA and RUS to expand access to and adoption of broadband services. The State of Colorado has received \$3.7 Million in BIP funds which represent less than 0.20% of total broadband funding. The West received 51% of total BIP loans awarded, about 21% of the total BTOP grants awarded (as of 3/1/10).
- The EAGLE-Net project proposes to invest up to \$135,000,000 in the broadband infrastructure of the state of Colorado, connecting; 178 K-12 School Districts serving over 2,000 schools & 800,000 students, 15 Community Colleges, 26 Libraries, 12 BOCES, 3 Institutions of Higher Education, Public Safety, Healthcare, Cities, and Counties, providing Internet, Internet2 and Wholesale Capacity to 177 communities.
- Market forces haven't been sufficient to drive the investment in Colorado's rural and remote areas, case in point; K-12 Schools, Libraries & Community Colleges pay 10 times the rate of neighboring states for ½ the bandwidth Colorado is ranked 42nd out of 50 states in broadband connectivity.
- EAGLE-Net filed a Middle Mile project in Round One that brought together public private partnership consisting of private companies such as Adesta, BNI, Conterra, IBM, Level 3, Qwest, combined, these companies have over 200 years experience constructing, operating and maintaining carrier class national telecommunications networks.



## **Colorado Community Anchor Broadband Consortium (CCABC) Project – Connecting Colorado’s Middle Mile**

### **Project Information**

#### **Executive Summary**

##### **A- Opportunity.**

Historically, it has been economically unfeasible to construct a ubiquitous all fiber optical broadband network in Colorado. The State’s physical geography is the most demanding physical geography in the lower 48 states; unusually diverse, encompassing both rugged mountains and vast plains. Because of the out-of-market broadband construction costs in Colorado (1 linear mile of distance could equate to 3-6 miles over rugged terrain), the fiber optic networks built by various utility companies serve only the major cities resulting in the creation of rural underserved broadband islands throughout Colorado with no competitive middle mile high bandwidth connectivity. The middle mile build out will not be completed by the private sector because the costs are too great to reach too few customers. Our Community Anchor schools, community colleges, libraries, and public safety entities have few competitive broadband options. Left to pure market forces, Colorado will continue to have inferior broadband coverage or none at all.

This application addresses statutory goals by improving access and affordability for education, healthcare, public safety, community institutions, and last mile providers. High-speed broadband access and connectivity are vital for Colorado’s economic growth, global competitiveness, innovation, and education of its population. The Colorado Community Anchor Broadband Consortium (CCABC) strategy begins with the expedient and sustainable expansion of the existing EAGLE-Net network; building out of an “open” network middle mile solution that will provide fiber where economically feasible and/or FCC licensed microwave connectivity to critical middle mile Community Anchor locations statewide. Bandwidth distribution will first support the public Community Anchor tenants and then private connectivity. This high quality middle mile addresses the public/private middle mile needs of major portions of Colorado; will promote last mile completion of broadband deployment, and will provide a full range of interconnectivity to meet provider, carrier and end user requirements.

##### **B- Description.**

A detailed assessment was undertaken of Colorado’s schools, community colleges, higher-educational institutes, libraries, healthcare facilities, public safety institutes, and emergency responders to determine those Community Anchor Institutions (CAI) without adequate broadband infrastructure. CCABC has received service confirmation from existing EAGLE-NET CAIs as well as new anchor institutions. The proposed project is shovel ready and is supported by a \$21.6M cash match and an \$13.1M in-kind match. This middle mile solution will push high-speed broadband into parts of the state that are unserved or underserved, thus creating the



opportunity to expand broadband to homes, businesses, and other public institutions currently without access.

This project builds a sustainable middle mile network that touches unserved or underserved portions of all 64 Colorado counties. The network is designed as a layered solution with the primary emphasis is to build the physical connections to the Community Anchor locations first. This will create the middle mile distribution facility to a broad range of groups and provide ubiquitous connectivity to the EAGLE-NET Internet/Internet 2 facilities that can supply current and future Tier 1 Internet bandwidth to CAIs and Last Mile service providers. The initial middle mile network will connect all 12 of Colorado's Regional Service Areas (RSA), providing broadband access to 234 Community Anchors in 177 communities throughout the State.

### **C- Households and Businesses.**

The CCABC Project will provide in excess of 4,954 miles of direct access to an estimated 1,623,852 households and 50,077 businesses.

### **D- Community Anchor Institutions.**

The CCABC Project will initially provide broadband Internet service to 178 School Districts, 26 Libraries, 12 BOCES, 15 Community Colleges, and 3 Higher Educational entities, and allow for access to private Middle and Last Mile broadband service providers for distribution to their residential and business customers. CCABC will expand its offering to other CAI locations immediately upon completion of each individual RSA, to include local and County government administration, health and human services and first responder/public safety entities (approximately 350 locations), municipal entities (approximately 400 locations), non-profit services organizations (approximately 240 locations), private non-profit foundations and housing agencies (approximately 25 locations).

### **E- Proposed Services.**

Service offerings include broadband transport of Commodity Internet, Internet2, and managed services at speeds of 20 Mbps-1Gbps per CCI with additional capacity for expansion.

### **F- Non-discrimination and Interconnection.**

CCABC will provide access to its participating Community Anchors and allow all private sector broadband providers access to bandwidth to provide their end users greater capacities at cost sharing rates. The network will provide open access interconnect points in each of Colorado's 64 counties. CBOCES/EAGLE-Net has established policies that are fully consistent with the BTOP NOFA's nondiscrimination and network interconnection obligations. Any middle or last mile provider or wholesaler within the CCABC service areas is eligible to connect at reasonable rates and terms.



## **G- Type of System.**

The Middle Mile network includes a fully meshed Core Network with major nodes in key geographic locations in Colorado. The Core Network will have a total of six major nodes with two locations in Denver and one location in Fort Collins, Grand Junction, Durango, and Pueblo respectively. From the core major nodes, aggregation sites extend in a hub and spoke topology architecture into the various sub-regions of the state. The Edge/Access Network consists of a hybrid network solution that utilizes existing fiber optical infrastructure, new fiber construction, and IP based carrier-grade, Ethernet compatible FCC licensed microwave solution to extend connectivity from the fiber network. This hybrid fiber optical and/or FCC licensed microwave network will provide the most cost effective and efficient broadband solution for the network.

## **H- Qualifications.**

CCABC is a public/private venture for the statewide expansion of the existing EAGLE-Net network. EAGLE-Net will leverage existing agreements and is currently negotiating agreements with Conterra Telecom Services, BNI Solutions, and Adesta, LLC for the implementation of this project. These companies are leaders in the field of Internet access, telecom fiber and wireless construction including: network engineering, integration and testing, field installation, training and physical maintenance/support. EAGLE-Net also has an existing Customer Agreement with IBM to provide overall systems integration / project management guidance, volume pricing discounts, and will interface with the private partners to insure implementation and grant compliance.

CBOCES has been providing technology to K-12 and Higher Education institutions for 40 years. CBOCES/EAGLE-Net provides network services; transport and technical help desk/on-site support for member school districts and non-member school districts/BOCES in Colorado. CBOCES/EAGLE-Net has secured access to the Internet2 for Colorado K-12 School Districts and other governmental and non-profit entities.

Conterra designs, builds, operates and maintains broadband networks for K-20, healthcare and government entities; wireless carriers and select enterprises primarily in rural and geographically challenged areas utilizing hybrid fiber optical and FCC licensed microwave transport networks. BNI will assist with network engineering, integration and testing, field installation and network monitoring. Adesta is a major telecommunications constructor/integrator of fiber and wireless hybrid networks. Adesta has deployed over 2 million fiber miles. Conterra has begun the process of registering to become a CLEC in Colorado.

## **I- Cost.**

CCABC will build a \$135.3M middle mile network consisting of terrestrial fiber optic cable, existing and new build where economically feasible, with additional fixed FCC licensed microwave connectivity. The proposed project is shovel ready and is supported by a \$21.6M cash match and an \$13.1M in-kind match.



**J- Expected Subscribers.**

Within the first 36 months – 376 identified Community Anchors serving more than 1,000,000 K-12 students, teachers, and administrators; within 60 months an additional 450 Community Anchors.

**K- Number of Jobs.**

Saved or Created jobs Estimated at up to 659 Direct Job-years, 371 Indirect Job-years, and 549 Induced Job-years using guidelines referenced by BTOP.