Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

Submitted Date:	**Easygrants ID: 7823**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** ADAMS COUNTY COMMUNICATIONS CENTER, INC.
Task: Submit Application - BTOP	**Applicant Name:** Mr. Brian Shepherd

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A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
DUNS Number	830149840
CCR # (CAGE)	60J31
Legal Business Name	ADAMS COUNTY COMMUNICATIONS CENTER, INC.
Point of Contact (POC)	BRIAN SHEPHERD 3032277124 Ext. bshepherd@adcom911.org
Alternate POC	BILL MALONE 3032277101 Ext. bmalone@adcom911.org
Electronic Business POC	BRIAN SHEPHERD 3032277124 Ext. bshepherd@adcom911.org
Alternate Electronic Business POC	BILL MALONE 3032277101 Ext. bmalone@adcom911.org

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
Prefix	Mr.
First Name	Brian
Middle Name	
Last Name	Shepherd
Suffix	

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Telephone Number	303-227-7124
Fax Number	303-227-8700
Email	bshepherd@adcom911.org
Title	Deputy Director

Additional Contact Information of Person to be Contacted on Matters Involving this Application:

Project Role	Name	Phone	Email
Secondary Point of Contact	Mr. Bill , Malone	3032277101	bmalone@adcom911.org

Environmental Point of Contact

Prefix: Mr. Name: Brunswig, Mike Suffix: Telephone Number: 3032277117 Title: GIS and Facilities Manager
Prefix: Mr. Name: Shepherd, Brian Suffix: Telephone Number: 3032277124 Title: Deputy Director

Organization Classification	
Type of Organization	Non-profit Corporation
Is the organization a small business?	No
Does the organization meet the	No

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definition of a socially and economically disadvantaged small business concern?	

Authorized Organizational Representative	
AOR Name	SHEPHERD, BRIAN
Result	Applicant Authorized

Project Title and Project Description

Project Title: ADCOM 911/DIA Regional Broadband Public Safety Network

Project Description: This 700Mhz Long Term Evolution (LTE) broadband project will provide secure, reliable wireless data service to approximately 2,000 first responders from 15 Public Safety agencies operating within the Adams County and Denver International Airport service areas. Additionally, the project will interconnect 13 Community Anchor Institutions in the greater Denver area including 4 PSAPs.

CCI Priority Checklist

The following items were selected from the CCI Priority Checklist:

5. This project will deploy Middle Mile broadband infrastructure to public safety entities.

7. This project will deploy Middle Mile broadband infrastructure and the applicant has proposed to contribute 30 percent or more in non-federal cost match.

Comprehensive Community Infrastructure Components

The following items were selected from the Comprehensive Community Infrastructure Components:

Middle Mile

Last Mile Non-Rural

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BIP Applicants

Have you also applied to BIP for funding in the sample proposed funded service area?

- No

If Yes, please provide the project title and Easygrants ID number:
Title of Joint BIP Application:
Easygrants ID:

Other Applications

Is this application being submitted in coordination with any other application being submitted during this round of funding?

- No

Easygrants ID	Project Title

If YES, please explain any synergies and/or dependencies between this project and any other applications.

Individual Background Screening

Is the Applicant exempt from the Department of Commerce requirements regarding individual background screening in connection with any award resulting from this Application?

- Yes, Applicant is exempt because it is a unit of a state or local government

If the answer to the above question is "No," please identify each key individual associated with the Applicant who would be required to complete Form CD-346, "Applicant for Funding Assistance," in connection with any award resulting from this Application:

Name	Title	Employer

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B. Executive Summary, Project Purpose and Benefits

Essay Question

Executive Summary of the proposed project:

Opportunity
Within public safety, the last decade has seen an explosion in the use of real-time information by first responders. Mobile Data Terminals (MDTs) have gone from being a novelty to an essential tool, with the number of applications available to first responders growing exponentially. This increased demand for information has put tremendous pressures on the underlying network infrastructure. While the commercial carrier networks allowed for the adoption of first generation public safety applications, the second generation of real-time data exchange tools have outpaced what the commercial market can offer. The public safety community requires a robust, secure, reliable wireless broadband network with maximum coverage. As one of the 21 recipients of a waiver by the Federal Communications Commission (FCC) to develop a broadband, wireless, Long Term Evolution (LTE) network for Public Safety using the 700MHz spectrum, the Adams County Communications Center (ADCOM 911) and Denver International Airport (DIA) are poised to develop the wireless network desperately needed by public safety agencies, setting the stage for regional development and eventually integration into a national public safety broadband network. In addition to providing public safety end users wireless broadband access, this project will also begin the development of a public safety fiber network linking 4 Public Safety Answering Points (PSAP) and other community anchor institutions throughout the greater Denver area. This fiber network will allow PSAPs to integrate data between agencies and begin to realize the benefits of Next Generation 9-1-1.

Project Description
ADCOM 911 is a multi-jurisdictional public safety communications center that provides voice and data services to five law enforcement agencies and ten Fire/EMS agencies. We serve agencies at the municipal and county levels as well as special districts in both urban and rural

areas with a total population of approximately 440,000. The Denver International Airport is by land size at 53 square miles (140 km2), the largest international airport in the United States, and the third largest international airport in the world. In 2008, Denver International Airport was the tenth busiest airport in the world by passenger traffic with 51,245,334 passengers. It was also the fifth busiest airport in the world by aircraft movements with 625,884 movements. The 33,000 acres (52 sq mi; 130 km2) of land occupied by the airport is surrounded by Adams County.
Working together, ADCOM 911 and DIA plan to implement up to 40 unique LTE access points throughout Adams County and the DIA property. First responders within the field will use a variety of end-user devices to access the network for a variety of data needs including records access, criminal checks, Automatic Vehicle Location and video based applications. This network will utilize existing and new infrastructure to backhaul all data to the centralized Evolved Packet Core (Core) located at ADCOM 911 facilities. In addition to enhancing the wireless access for first responders, the corresponding network infrastructure will serve the purpose of interconnecting 15 community anchor institutions.

Proposed Service Area
The initial proposed service area is the entirety of Adams County, Colorado and the entire property of DIA. Adams County encompasses approximately 1,200 square miles with a population of 440,000; it is 18 miles from north to south and 72 miles from east to west. The county is immediately north of the City and County of Denver and is the 5th most populous county in the state. With 6 municipalities and a large unincorporated region, the population is a unique mix of urban, suburban and rural populations. Denver International Airport is the largest international airport in the United States at 53 square miles and the 3rd largest in the world. DIA is surrounded on 3 sides by Adams County, and uses first responders from Adams County and the City and County of Denver in emergency plans and daily operational activities.

Number of households
Adams County has an estimated 164,000 households, all of which will be served by first responders using this network. As an international airport property, DIA has no established households.

Number of community anchor institutions

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The proposed project will interconnect 13 community anchor points: 4 PSAPs, 4 municipal governments, 2 county governments, 1 state judicial district, 1 school district and 1 federal center. The specific anchor institutions are:
-ADCOM 911
-Thornton Communications Center
-Denver Unified Communications Center
-Jefferson County Sheriffs Communications Center
-Adams County Government
-Jefferson County Government
-City of Commerce City Government
-City of Brighton Government
-City of Thornton Government
-City of Northglenn Government
-State of Colorado 17th Judicial District
-Brighton 27J School District
-Denver Federal Center

Proposed services and applications
The primary proposed service will be a wireless broadband LTE network using the 700MHz public safety spectrum. The network will offer Internet Protocol (IP) services to any public safety agency within the service area and any first responder roaming into the network with the appropriate equipment. A secondary service will be the fiberoptic interconnection of multiple PSAPs creating an IP network to transmit the wireless data and begin to implement Next Generation 9-1-1 services.

Approach to non-discrimination and interconnection
As a requirement of the FCC waiver, the wireless network will be open to any public safety responder from any level of government that has the requisite LTE compatible equipment.

Type of broadband system
The wireless network will implement the 3GPP revision 8 standards for LTE to create a flat IP based network. The fiber-optic network will utilize standard TCP/IP.

Qualifications of applicant

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Together, ADCOM 911 and DIA have designed, implemented and managed multiple wired and wireless networks currently used by first responders. ADCOM 911 successfully implemented the first 700MHz Simulcast Land Mobile Radio (LMR) system in the nation. Due to their nature, both ADCOM 911 and DIA have experience working with a variety of governmental, public and private organizations and managing multi-agency projects.

Overall infrastructure cost of the system
The overall cost of the project is $19,837,091.

Overall expected subscriber projections
By the end of the 3-year grant cycle, ADCOM 911 and DIA expect this network to be used by approximately 2,000 first responders.

Number of jobs estimated to be created
The ADCOM 911/DIA Regional Broadband Public Safety Network will create an estimated 213 job years. Of these, it is estimated that 136 will be from direct and indirect effects and that 77 will be from induced effects.

Project purpose:

The primary purpose of this project is to develop a 700MHz LTE wireless broadband network for the public safety agencies within the ADCOM 911/DIA service areas. The secondary purpose is to use the required network infrastructure to interconnect 13 community anchor institutions including 4 independent PSAPs. By providing both last mile (wireless access to field responders) and middle mile (PSAP interconnectivity), the project will greatly expand broadband access to public safety agencies in the proposed areas.
Over the last decade, public safety has become increasingly reliant on real-time information exchange in both day-to-day and critical incident situations. As no realistic alternative has existed, ADCOM 911/DIA have become dependant on private cellular carriers for wireless data access. While these private carrier networks were sufficient for the first generation of public safety applications, the requirements for speed, reliability and security have far outpaced what the commercial carriers can offer. When the Federal Communications Commission provided waivers for 21 agencies in the 700MHz band, it created the opportunity that agencies like ADCOM 911/DIA have been waiting for; the ability to create our own, interoperable, secure, high-speed wireless data network that will allow all first responders to receive the information

they are so reliant on. In addition to providing wireless access, the proposed network will begin the process of linking all PSAPs within the greater Denver area by interconnecting 4 of the largest. This will not only increase the information flow between agencies, but also set the stage for future expansion of the wireless network to service areas that surround ADCOM 911/DIA. Currently, ADCOM 911/DIA support a variety of applications that enable our first responders to be equipped with the latest technology. Computer Aided Dispatch (CAD), Police and Fire records systems as well as in vehicle mobile data systems and AVL-based applications are just a few of the applications that have become standard use by first responders. These applications are restricted in performance by limitations in the existing network, which has become a weak link in the system. Outages, poor coverage and limited bandwidth often cause first responders to verbally request the information they are accustomed to receiving automatically on their mobile computer, thus slowing their response and taxing the already limited dispatch personnel. Additionally, ADCOM/DIA foresee the demand for high-speed data growing exponentially into the future. For example, there are many applications available, or in development, in which our agencies have shown great interest. These include applications that allow police officers to access criminal checks and histories, audio and visual information directly from their vehicles as well as providing access to the regional multi-governmental law enforcement data sharing system (Coplink). Future applications include providing access to: multiple video-based applications, the Colorado Department of Transportation system of highway and Interstate cameras, advanced mapping capabilities, building floor plans and the real-time transmission of patient information by EMS staff. In addition, Smart Phone and PDA devices offer a wide variety of exciting possibilities for future applications including interconnecting traditional public safety Land Mobile Radio (LMR) Systems with Voice Over Internet Protocol (VOIP). As mentioned previously, one limiting factor for these applications is the inadequacies of the commercial networks currently available. The primary issues public safety has with these networks are:

- Limited bandwidth and coverage: While these networks advertise tremendous speeds, the practical implementation falls far short. Limited coverage is also a roadblock as the proposed service area includes both rural and urban populations with many citizens living in areas without any cellular coverage by the private carriers. This often leaves first responders lacking all the tools available to them when responding to incidents. The large footprint of DIA makes it impossible for emergency and security personnel to receive the appropriate coverage and bandwidth throughout the property.

-Network Partitioning: In addition to the coverage issues, cellular carriers can not partition network traffic and bandwidth, in effect leaving the police officer who is attempting to run a

criminal check on a suspected felon, competing for bandwidth with the teenager downloading the newest music video.
-Security: Information being transmitted over these public networks is increasingly sensitive and while the carriers provide the best security they can, it falls short of the requirements of public safety.
The proposed network will remedy the highlighted issues by providing public safety with a proprietary, interoperable network built to the specific specifications that public safety requires. Our vision for the LTE broadband network not only includes serving our agencies, but providing an infrastructure that could be utilized by any public safety agency individual who may roam onto our network. The proposed network will also allow us to partner with school districts to provide access to applications such as a school alerting systems, real-time video monitoring, and Internet access.
In order to fully achieve the interoperability envisioned through the wireless network, it will be crucial to connect many other PSAPs within the area. Currently, the network connecting these PSAPs is antiquated and offers minimal functionality. By interconnecting the PSAPs, we will not only allow for full wireless roaming potential but also begin to realize the potential of Next Gen 9-1-1 and provide the citizens we serve with the best possible emergency communications service.

Recovery Act and Other Governmental Collaboration:

ADCOM 911/DIA will collaborate with several governmental entities for the purpose of increasing the effectiveness and efficiency of the broadband network build out, implementation and operation.

The most important of these collaborative efforts involves the National Institute of Standards and Technology (NIST). Representatives from ADCOM 911/DIA have met with representatives from NIST at their Boulder, Colorado location. This collaboration is crucial for 2 reasons. Collaboration allows for input into the development of the standards of the 3GPP LTE broadband technology. Additionally, NIST will be conducting trials of various LTE broadband technologies in the 700 MHz spectrum specifically geared towards public safety usage.

ADCOM 911/DIA will also collaborate with the Emergency Response Interoperability Center (ERIC), part of the Federal Communications Commission, to ensure our regional network is compatible with the national public safety broadband network standards.

ADCOM 911 and its law enforcement agencies currently partner with the Criminal Justice Information Services Department of the Federal Bureau of Investigations in order to

facilitate law enforcement record sharing, criminal background checks and many other elements of law enforcement information sharing. ADCOM 911 sees great potential to expand and enhance these services and will be able to offer this service with greater speed and coverage if this project is implemented.

There are numerous other examples of potential governmental collaboration that exist as a direct result of BTOP grant funding, primarily partnerships with other Public Safety Answering Points and governmental agencies within Colorado. For the immediate project, ADCOM 911 and DIA have developed partnerships with the City and County of Denver and Jefferson County, both immediate geographic neighbors to establish the network infrastructure required for the project. Additionally, representatives of ADCOM 911 have begun to reach out to entities within a geographic proximity to the planned broadband network, and have received great interest in participating in any future network expansion. They include; Arapahoe County, Douglas County, the City of Aurora, and the City and County of Broomfield. This collaboration could lead to the coverage of the entire greater Denver area serving a combined 3,760 square miles and 2.5 million individuals.

In addition to the local collaboration, initial efforts have already taken place to establish a regional network infrastructure. ADCOM 911 and DIA have had preliminary discussions with the Topaz Regional Wireless Cooperative in Arizona and the State of New Mexico, both FCC waiver recipients on establishing connections between the individual networks.

ADCOM 911 has provided letters from these various entities, describing their respective level of interest, within the attachments section of this application.

Fit with BTOP CCI Priorities:

ADCOM 911/DIA are applying for BTOP funding under the Public Safety Priority within the CCI framework. The joint project will deploy a 700 MHz LTE wireless network providing data services to public safety personnel throughout the respective service areas. This network will provide coverage to an estimated 85% of the approximately 1,200 square miles of the collective service area including 99% coverage in the core population/business areas. The network will provide public safety agencies superior bandwidth, coverage and reliability to the existing commercial carrier system they are currently reliant upon.

A secondary effect of developing the infrastructure for the wireless network will be the interconnection of multiple PSAPs and local governments with an IP-based fiber optic network. By connecting these PSAPs, we will be accomplishing two objectives:

-Setting the stage for future wireless development: In granting the waivers to operate the wireless network, the FCC expressly stated that waiver recipients needed to work with all public safety entities in their geographic areas. In connecting a variety of PSAPs in the surrounding areas, other public safety entities will be able to work with ADCOM 911/DIA to expand the network throughout the metropolitan area and the state.
-Interconnect PSAPs for Next Generation 9-1-1: A core requirement for Next Generation 9-1-1 is that all PSAPs must be connected via an IP-based network. In utilizing the developed network for the wireless project to interconnect multiple PSAPs, this project will begin the process of creating the required network for Next Generation 9-1-1 functionality within the metropolitan area.
By increasing broadband access to both first responders in the field and the communications centers that coordinate the response, the project fully meets the objectives set forth by the CCI guidelines. In addition to the specific technical elements within the CCI priorities, the project proposed by ADCOM 911/DIA is based upon a 30% cash and in-kind match.

Is the applicant seeking a waiver of the Buy American provision pursuant to section x.Q of the NOFA?

- No

Is the applicant deliquent on any federal debt?

- No

If Yes, justification for deliquency:

Are you seeking a waiver of any requirement set forth in the NOFA that is not mandated by statute or applicable law?

- No

Is the applicant a current recipient of a grant or loan from RUS?

- No

C. Partners

Are you partnering with any other key institutions, organizations, or other entities for this project?

- Yes

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If YES, key partners are listed below:

Project Role: Sub-recipient Name: Spomer, Leonard Phone: 3033422879 Email: Leonard.Spomer@flydenver.com Address 1: 8500 Pena Blvd. Address 2: Address 3: City: Denver State: Colorado Zip Code: 80249 Organization: Denver International Airport Organization Type: Other Small business: No Socially and economically disadvantaged small business concern: No
Project Role: Sub-recipient Name: Tharp, Dennis Phone: 3034436690 Email: tharp@slblaw.com Address 1: 250 Arapahoe Address 2: #301 Address 3: City: Boulder State: Colorado Zip Code: 80303 Organization: Jefferson County Emergency Communications Authority Organization Type: Other Small business: No Socially and economically disadvantaged small business concern: No

Description of the involvement of the partners listed above in the project.

ADCOM 911 and DIA are the two primary partners in the proposed project. As we have described, ADCOM 911 and DIA applied for the FCC waiver together with the intention of developing a joint public safety wireless network. The two organizations fit together

geographically as DIA is surrounded on three sides by Adams County and uses ADCOM 911 agencies for many of their incident management plans.
The plan for the partnership is to develop the network on a proportionate level from each agency. Of the 36 total access sites, initial expectations are that DIA will install 6-8 on their property and ADCOM 911 will install the remainder throughout their service area. The primary network core will be installed at the ADCOM 911 facilities with a potential redundant core located at DIA facilities.
Before the network is established, ADCOM 911 and DIA shall enter into a formalized agreement for the governance, operation and maintenance of the network. From a financial perspective, ADCOM 911 and DIA are both contributing cash and in-kind assets on a proportionate basis.
The proposed project has a secondary partner as well in the Jefferson County Emergency Communications Authority (JCECA). The JCECA is contributing $255,000 of cash towards the overall cash match. This match will specifically be used towards the 6th Avenue fiber segment, which will complete the interconnection of 4 PSAPs (ADCOM 911, City of Thornton Communications, City of Denver Communications, Jefferson County Sheriff Communications) as well as allow for the connection to the Denver Federal Center. This link will also allow for future expansion of the wireless network with the ability to connect 10 additional PSAPs.
In addition to these primary partners, multiple local public-safety jurisdictions and governments will be integrated into this project. The fiber network to be establish will connect multiple municipal and county governments and school districts including:
-Adams County Government (including Sheriff's Department)
-Jefferson County Government (including Sheriff's Department)
-City of Commerce City (including Police Department)
-City of Brighton (including Police Department)
-City of Thornton (including Police Department)
-City of Northglenn (including Police Department)
-Brighton School District 27J
These connections will allow greater interoperability with not only the first responders served by ADCOM 911 and DIA, but the integration of individual Offices of Emergency Management (OEMs) and other local entities that contribute to overall public safety.

D. Congressional Districts

Applicant Headquarters

- Colorado

Project Service States

Colorado

Project Service Areas

Colorado - 1

Colorado - 2

Colorado - 7

Will any portion of your proposed project serve federally recognized tribal entities?

- No

Indicate each federally recognized tribal entity your proposed project will serve.

Have you consulted with each of the federally recognized tribal entities identified above?

- No

E. Service Area Details

Is the applicant seeking a waiver for providing less than 100% coverage of a service area?

- No

Project Details

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Service Area Type: Last Mile
Service Area Name: Adams County and Denver International Airport
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Underserved

If Service Status is "Underserved" please select at least one applicable option from this list.
No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;

Total Square Miles in Service Area: **1,244**
Total Population in Proposed Service Area: **440,994**
Total Number of Households in Service Area: **164,106**
Total Number of Businesses in Service Area: **8,442**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **16**
Unemployment Rate in the Service Area: **8**
Median Income in the Service Area: **56,601**
Estimated Percentage of Households with Access to Broadband: **80**
Estimated Percentage of Households Subscribing to Broadband: **80**

F. Community Anchor Summary

Community Anchor Summary	
Schools (k-12)	1
Libraries	0
Medical and Healthcare Providers	0
Public Safety Entities	5
Community Colleges	0
Public Housing	0

Other Institutions of Higher Education	0
Other Community Support Organization	0
Other Government Facilities	7
TOTAL COMMUNITY ANCHOR INSTITUTIONS	**13**
Historically Black colleges and Universities	0
Tribal Colleges and Universities	0
Alaska Native Serving Institutions	0
Hispanic Serving Institutions	0
Native Hawaiian Serving Institutions	0
TOTAL MINORITY SERVING INSTITUTIONS	**0**

G. Project Benefits

Demographics

Jobs	
How many direct jobs-years will be created from this project?	213
How many indirect jobs will be created from this project?	136
How many jobs will be induced from this project?	77

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Methodology used to estimate jobs:
Our estimates were derived from the methodology suggested by the Council of Economic Advisors.

Project Impact:

The proposed ADCOM 911/DIA broadband wireless network will have significant impact on all public safety agencies within the proposed service areas. The network will allow for the adoption of numerous advanced public safety and security technologies that have previously been unfeasible due to the lack of a secure, reliable broadband wireless network. Additionally, the project will allow for the interconnection of multiple PSAPs and other community anchor institutions within the greater Denver area that will allow public safety to begin implementation of a Next Generation 9-1-1 network.

The proposed network will dramatically improve the coverage, network throughput and reliability to the over 2,000 first responders within ADCOM 911 and DIA. Initial estimates put the wireless coverage at 85% of the geographic area in the ADCOM 911 service area and 99% coverage of DIA. Additionally, the proposed network will work to interconnect 4 PSAPs serving approximately 1.6 million citizens. This is a dramatic improvement over the estimated 60% coverage of the ADCOM 911 service area and 70% coverage of DIA with private cellular carriers and no interconnection between the 4 PSAPs.

The 700MHz wireless network will provide interoperable data transport for database query, report input, wireless ticketing, AVL, instant messaging, video services (including school safety applications), fire response and evacuation plans, access to the public internet, airport perimeter security, airport runway vehicle incursion avoidance, distribution of emergency notifications (NOTAMs) to flight staff, emergency runway clearance and repairs, and future data applications. Additionally, the network architecture and governance will promote regional use of the network by outside agencies for large scale events, allowing them unfettered access to the public internet, as well as secure VPN connections to their home networks.

As first responder budgets have been cut in recent years they have become more reliant on technology to do more with less. By increasing their access to wireless data, these applications will allow first responders to increase their productivity. Additionally, the implementation of a public safety broadband network will create true interoperability between first responders in the field.

The greater Denver area, as with most metropolitan regions, is the aggregation of a centralized urban area with numerous suburban areas surrounding it. The impacts of this development on public safety are that multiple jurisdiction responses to any major incident are becoming the standard. As a result, the requirement for inter-agency communication is critical. With this project, ADCOM 911 and DIA will begin the development of a truly multi-agency network that

will allow first responders and PSAPs to seamlessly share data both in the field and at command centers. First responders venturing into neighboring jurisdictions will have access to the wireless data systems that provide real-time information and applications during incidents. Additionally, by interconnecting multiple public safety entities and community anchor points within three separate counties including PSAPs, police/fire stations and school districts, government representatives will be able to share data and information. A complete list of anchor institutions to be affected by this project is:
-ADCOM
-City and County of Denver Unified Communications Center (PSAP)
-Denver International Airport (PSAP and Operations)
-Jefferson County Communications Center (PSAP)
-City of Thornton Communications (PSAP)
-Adams County Administrative Campus
-Adams County Detention Center
-Adams County Justice Center
-Brighton Police Department
-Commerce City Police Department
-Northglenn Police Department
-Brighton 27J Schools
-Federal Center

These PSAPs and anchor institution connections will facilitate the transfer of dispatch event information and status, video services, secure patient information, secure instant messaging, and other communication services. Law Enforcement connections will provide officers access to shared and hosted services such as criminal database queries, mobile dispatch, and mobile field reporting. As the wireless network is expanded beyond the ADCOM 911 and DIA service area, the interconnections will facilitate complete area-wide interoperability.
Fire department connections will allow fire personnel to access mobile dispatch, mobile reporting, computer aided dispatch data transfer to fire stations and fire records services. The network will also allow for enhanced fire station alerting.
The connection will be used to provide timely information transfer needed to assist DIA and ADCOM 911 personnel with day-to-day operations, mutual aid response, and joint response to shared events.
School district connections will allow instant communications between school administration and ADCOM 911 in the case of school lock-downs, evacuations, or emergency response. This is

a critical conduit needed between schools and emergency responders. Currently, there is a significant deficit in interoperable communications between first responders and school personnel.

Vulnerable Populations:

The ADCOM 911/DIA Public Safety Regional Broadband Network will serve all populations in the service area by enhancing the ability for public safety to effectively respond to incidents. The immediate users of the proposed system will be all Law Enforcement, Fire, EMS and other first responders in the proposed service area. Due to current deficiencies in commercial carrier coverage, at least 2/3 of the service area is lacking sufficient broadband service, which significantly impacts the ability for public safety to effectively respond to calls for service and utilize all tools available to them. The proposed network will cover approximately 85% of the 1,200 square mile service area with broadband coverage, vastly increasing their access. The affected service areas are listed in the service area data upload section as Service Area Tracts.xls. With the increased reliance on wireless data networks, stable, widespread coverage has become a necessity. It is not uncommon for first responders to be responding to areas outside the reliable coverage of the traditional radio systems. In these situations, data coverage becomes critical, as it is the only way for dispatch centers to maintain communication with those in the field. Additionally, responders in rural areas are often forced to react to situations without the ideal assistance. Providing these responders with reliable wireless data ensures they will at least have all the information they need when addressing a situation.

Level of Need:

ADCOM 911 provides Computer Aided Dispatch (CAD), voice radio communications, both wired and wireless data services to five law enforcement agencies and seven fire departments. Together, these agencies serve throughout Adams County, Colorado with a population of approximately 440,000. In addition to providing standard 911 services, ADCOM 911 is also a data center hosting records, jail and other application servers, network equipment, and is the common demarcation point for Colorado Crime Information System (CCIS) and National Crime Information Computer (NCIC) for the agencies we serve.

Over the past decade the need for information exchange between the communications center and front-line responders has exploded. While commercial networks have provided adequate coverage to this point, we are now at a standstill in releasing new technologies until a viable broadband network is implemented. The reasons for this limitation are:

-Two-thirds of our coverage area has little to no commercial coverage as it is classified as rural.

-Within the urban population center, actual throughput of the network falls far short of public safety requirements.
-Network outages and standard maintenance are often performed at times when public safety is the busiest.
-There is no network prioritization for public safety leaving first responders competing for bandwidth with the general public.
DIA is responsible for all public safety, security and emergency response on the 33,000-acre campus. For a number of years, the Technologies Division at DIA has been researching and planning on a wide area, high speed data solution in response to a number of requests from agencies within the Aviation department. These requests were brought to the RF and Wireless Group as ideas that would assist with managing the airfield, maintenance, design, law enforcement, fire fighting, and rescue. It is believed that the waiver granted by the Federal Communications Commission (FCC) to ADCOM 911 and DIA provide the means to enhance the capabilities and response of agencies and divisions responsible for public safety at DIA. Public safety within DIA has not been able to take advantage of the advances in handheld communications networks for voice, video and data. In comparison, public safety has large, heavy, voice-only radios. In the past, these radios have been adequate but recent advances in cellular technologies have made cell phones far more advanced and complex than the standard two-way radio used by police, fire, and paramedics. With the LTE opportunity in public safety, the ability of these critical first responders to have rapid voice, video and data while using small, lightweight portable devices with high speed data exchange with dispatch centers, CAD systems and AVL systems can become reality.
As we have outlined, a significant deficit in ADCOM 911/DIA's service offerings is the lack of a secure, reliable and sustainable private wireless data network and high-speed interconnections between the entities. Besides commercial carrier services, ADCOM 911/DIA presently do not have viable wireless data options. The National Public Safety Telecommunications Counsel (NPSTC) has formally stated that commercial carrier networks do not meet the requirements for public safety. The lack of site redundancy, back-up power and emergency capacity are glaring deficiencies in a large-scale disaster. Cellular coverage varies widely between urban and rural areas and these networks are often taken down for upgrades and service at a time of peak need for public safety. Finally, the fact that first responders must compete for bandwidth with the general public on commercial wireless networks makes quality of service and system access unpredictable. For example, as recent critical events have shown (natural disasters, school shootings, acts of terrorism), the commercial cellular networks are the first to be overloaded by the public. Once these networks have been saturated, there is no way to ensure first responders

to be guaranteed access to the system leaving the very individuals attempting to remedy the situation without a primary tool.

In response to the issues with commercial networks ADCOM 911 implemented a 900 MHz unlicensed spread spectrum wireless data network using Brighton, CO as a test city in order to test alternatives. After extensive testing it was determined that this technology did not meet the needs of public safety. A variety of issues such as lengthy switching times between sites, 900 MHz interference, and unreliable data rates caused us to abandon the network. Other system designs we researched include some form of licensed high frequency/low power design technologies. These were cost prohibitive due to the number of necessary sites, backhauls, and maintenance personnel to deploy such networks. When the FCC selected LTE as the standard for the national public safety broadband network, we agreed that the 700 MHz public safety broadband spectrum offers the optimum solution to our data needs. LTE technology is an efficient use of the spectrum and will meet our bandwidth needs for the foreseeable future.

Looking forward, with the funding of this project, ADCOM 911 and DIA will be able to greatly expand the usage of data in the field by first responders. Some of the applications that have already been identified and are available are:

-Multiple Database Access: Within law enforcement, there are now three primary databases that can be searched for suspect information. Each of these databases requires separate access, increasing the demand on the wireless network.

-Multi-media information: Recent upgrades to many local and state databases include pictures, audio and video related to the specific subject. Without the proposed network, first responders are limited to text-based information. For example, the Colorado Crime Information System (CCIS) recently upgraded their database to supply current mug shots of suspects to officers in the field; however, we are unable to utilize this feature due to bandwidth and coverage limitations.

-Prioritization: Within commercial networks, there is no way to prioritize access within the network on a critical incident. This can lead to key individuals not receiving the information they need and/or information being sent to individuals who should not have it. The LTE technology offers solutions for this issue by allowing preset and on-the-fly data prioritization and management.

-Real time video streaming: As the number of public areas that require monitoring is increased real time video streaming can be an invaluable tool. Officers and dispatch personnel can use wireless video to monitor multiple areas leading to greater efficiency with the limited human resources available. Additionally, real time streams of critical incidents can help first responders customize their response plans before arriving at the scene.

-School monitoring: Ensuring safety at schools is a primary goal of public safety. By integrating video, voice and data communications with schools, public safety can ensure incidents are responded to before they escalate and in the case of a critical incident, minimize the affects.
-Real-time vital health information transfer: A key factor in emergency medical services is the ability for medical staff at hospitals to be prepared when injured patients arrive. With this proposed network, local EMS providers will be able to implement real-time streaming of a patient's vital information as they are on route to the hospital. This transmission of information will allow all medical professionals involved to ensure the best decisions are made both in the field and upon arrival.
-Critical incident communications: When large-scale incidents occur, multiple agencies are required to respond creating a need for interoperable communications. By implementing an open network for all first responders and interconnecting PSAPs, the public safety community will be able to work together seamlessly when multiple agencies are required for response.
-Runway Incursion and vehicle location: DIA has had two runway incursions in the last several years. A runway incursion is when a vehicle, misunderstanding his location or direction from tower controllers, strays onto an active runway. One of the events at DIA caused the aborted landing of a Frontier jet preparing to land. An LTE data network will allow the use of GPS devices in vehicles to provide Geo-Fencing of active runways. This will prevent runway incursions through the use of ignition disable or data terminals/audio alarms when a vehicle is near the threshold of an active runway.
-Security Breach: At DIA, security breach results when an unauthorized individual(s) penetrates the sterile or restricted areas of the airport. Typically, this may result in aircraft delays, evacuation of airport sterile areas, and/or extensive searches. During a breach in May 2010, a good description of the suspect was available and likely a photo or video but the photo could not be distributed in a timely manner because no high-speed public safety data network was available. With LTE, the photo could be immediately sent to all public safety handheld devices.
-Fire Response at DIA: Fire assets on DIA need high-speed data for two applications. The first is visibility and location for responses in low visibility conditions. Past aircraft incidents have tended to occur in just these low visibility conditions. A new capability at DIA is Ground Control Radar that uses multilateration, termed ASDE-x, to identify vehicles on the surface of the airport. The LTE could work with this system by allowing the identification and locations for tower crews to direct emergency fire response in low visibility conditions. Currently, our HAZMAT fire response team is using cellular cards for a connection to a HAZMAT database. However, on the airfield, the cellular coverage is poor, the data speeds are slow and sometimes

the network is not available. With LTE, we can put high-speed data over the entire 53 square miles resulting in quicker data updates on hazardous materials, saving lives.
As multi-agency response to critical incidents has grown, so has the need for high-speed networks between public safety agencies. At first microwave deployments satisfied this need but the cost, reliability and service-intensive nature of microwave deployments has prompted ADCOM 911 to begin construction of a fiber optic network in the metropolitan part of Adams County (begun in 2008). ADCOM 911 and DIA hope to continue the development of this network into a metropolitan area wide network interconnecting not only the PSAPs within their service areas but establish a path for expansion into neighboring service areas. These interconnections will fulfill a desperately needed communications gap between PSAPs and schools in the area. There is a proven need to share broadband information such as on-scene video and other information essential to on-scene emergency operations. The broadband connectivity between PSAPs and school districts in conjunction with wireless broadband service to first responders will help to satisfy this need.
ADCOM 911 and DIA have partnered with multiple government and public agencies to use existing infrastructure where possible. For example, one of the proposed fiber elements will utilize existing light-rail construction paths to minimize the cost of fiber installation. This network development was begun after fully exploring the commercial offerings provided by Qwest, Comcast, Level 3 and Time Warner and finding their offerings did not meet the requirements of public safety. Commercial offerings would also require open-ended lease agreements not subject to regulation. Further, they would impose recurring budgetary burdens to the agencies we serve.

H. Technology

Technology Type

Indicate the technology that will be used to deliver last mile services. The following items were selected:

Wireline - Fiber-optic Cable

Wireless - Terrestrial Fixed

Other:

Technology Questions

Methodology for Area Status:

As part of the grant application process for Public Safety wireless broadband, ADCOM 911 performed an analysis on existing broadband services offered by commercial carriers. Through the analysis, it was identified that 2/3 of the proposed service area is inadequately covered or lacks coverage by commercial carriers. In addition, the coverage provided by the commercial carriers in this underserved area does not meet the minimum standard for broadband speed as identified in the BTOP NOFA. The remaining service area has better coverage, but is still unreliable and prone to frequent outages. Additionally the working throughput of the network is insufficient for public safety applications. This analysis is largely based upon existing contracts with commercial carriers.

Description of Network Openness:

Since the proposed project will be implementing a public safety network, ADCOM 911 and DIA will not implement the standard non-discrimination and interconnection standards in relation to public network access. ADCOM 911 and DIA feel it is crucial for the reliability of the network that only public safety and associated entities be allowed on the network.

Within public safety, ADCOM 911 and DIA will commit to meeting all requirements of the FCC waiver calling for complete interoperability between 700MHz public safety LTE networks. ADCOM 911 and DIA will ensure that any public safety responder with the proper equipment is allowed to roam onto our network and receive Internet access to establish connections to their home network. ADCOM 911 and DIA have already established communications with the State of New Mexico and the Topaz Regional Wireless Cooperative of Arizona (both FCC waiver recipients) to establish interconnectivity between the individual networks establishing a baseline for truly regionalized public safety networks.

Additionally, ADCOM 911 and DIA plan to establish guidelines for network access for other governmental agencies including local and state government agencies and local school districts. This access would be coordinated through entities such as local Offices of Emergency Management and School Safety Offices to ensure that access to the public safety network is available for appropriate use on both specific incident and an operational basis. As part of the project, ADCOM 911 and DIA have also established a broadband connection to the Denver Federal Center. This connection will be important, as ERIC has indicated the potential for all public safety networks to connect to a national core through the federal network. This connecting establishes the ability for our network to meet those guidelines.

The interconnection between PSAPs will also facilitate network openness within public safety, as it will provide first responders the ability to share information across multiple jurisdictions.

System Design:

The proposed system design will be comprised of two key elements, the 700MHz wireless broadband access network and the fiber-optic based network used to interconnect the key anchor institutions and transport all wireless data back to the system core. The proposed 700 MHz LTE broadband network will be designed with an open architecture that allows both for future expansion and easy integration with similar networks as they are constructed. The design will use the 3GPP standard release 8 (LTE) for deployment and interoperability using the 10 MHz of band class 14 allocated as the 700 MHz Public Safety Broadband Spectrum. The fiber network will utilize standard TCP/IP network design using a series of aggregation points and remote sites to interconnect all required network nodes. The following will describe the key elements of each component.

700MHz Wireless LTE
The key for the wireless delivery system will be the remote access sites (eNodeB). These eNodeBs must be strategically located to maximize coverage and capacity. Through the initial consultations with LTE vendors, ADCOM 911 and DIA have identified 10-15 preliminary sites that will be primary access points for the network. Once a final vendor is selected ADCOM 911 and DIA will work with the vendor to model the coverage of the system and identify the remaining sites. The eNodeB sites will be located on a combination of existing radio towers and available public buildings using rooftop antenna mounts to obtain the optimum Above Ground Level (AGL) height of the antenna. Based on initial estimates the network will have 36 eNodeB sites installed throughout the County and DIA property to provide wireless data service to mobile users.
In the LTE standards, the centralized control element of the network is called the Evolved Packet Core (Core) and is responsible for user authentication, network routing and application management. In our system ADCOM 911 and DIA will implement a Core at the ADCOM 911 Center with the possibility of a redundant core at DIA. This core will manage all users on the system and allow for network roaming to anyone meeting the LTE standards from other networks.

The final element of the wireless delivery system is the 700 MHz LTE user devices. Based on initial availability from vendors the proposed system will utilize a variety of devices (USB dongle, trunk mounted modems, fixed building modems) operating at a power of 250 mW to provide mobile users with a private, dedicated connection to application data at speeds up to 18 Mbps.

In order to connect all 36 sites, the system will require microwave connections between towers to aggregate data to points where high-speed fiber network access exists. ADCOM 911 and DIA have existing microwave links will be re-tasked to provide backhaul connection for some of the eNodeB sites in the field to fiber aggregation points. Additional backhaul links will be added to complete the 36-site topology as required, allowing for 45 Mbps or greater backhaul to each site. ADCOM and DIA will use a variety of licensed microwave technologies to accomplish the backhaul depending on the required bandwidth and geographical requirements.

Fiber-optic Network Infrastructure

In order to fully achieve the bandwidth potential of LTE, it is crucial to have a high-speed, high-capacity network to transport the data to and from the network core and to the remote tower locations. The proposed project will utilize existing and new fiber infrastructure to interconnect the various anchor points of the network including PSAPs, core locations and key aggregation sites. The preliminary system design will located the Core at the primary ADCOM 911 facilities with the potential of a redundant Core located at DIA to provide additional capacity for system growth and system redundancy in the case of a Core failure.

ADCOM 911 currently has fiber infrastructure that connects it to the eastern side of the core population center of the county. The new fiber proposed (Cherokee Tower Fiber and Thornton Fiber) in the project will be used to connect the western population centers together and then establish a connection between the two elements, completing a fiber ring topology.

DIA currently has fiber infrastructure throughout the property that will be utilized to connect all DIA sites together. DIA will require limited expansion of existing fiber segments to ensure all sites are interconnected.

ADCOM 911 and DIA have reached an agreement (letter of support included) with the City and County of Denver to provide the key link between the two entities. As Denver is the entity that geopolitically connects ADCOM 911 and DIA, it makes sense to use their existing network as the link. Additionally, the dispatch centers of DIA and Denver work closely as calls for service are often jointly dispatched.

The additional fiber segments (6th Avenue) will be used to establish a connection to the western segment of the greater Denver area and will allow for interconnection to Jefferson

County, which borders both Adams County and Denver to the west. This fiber segment will allow ADCOM 911 and DIA to interconnect with the Denver Federal Center, establishing future connection for a nation-wide core and allow for future expansion of the wireless network.

With the increased potential for applications, network traffic and roaming users, ADCOM 911 will increase the capacity of its existing Internet connection and implement dedicated Internet Proxy systems to control access to this resource.

Security will be primary concern for the network design with ADCOM 911 and DIA using a variety of technologies to ensure the entire network remains secure. Intrusion Detection/Intrusion Prevention systems (IDS/IPS) will be implemented at the network core to monitor all network access, both wireless and wired.

Is the applicant seeking a waiver pursuant to section IX.C of the NOFA so as to sell or lease portions of the award-funded broadband facilities during their life?

No

I. Project Budget

Project Budget		
	Federal Grant Request	**Match**
Last Mile	9,468,920	2,977,080
Middle Mile	4,413,171	2,977,920
Total	13,882,091	5,955,000

Project Budget Total: $19,837,091

Match Percent: 30.0%

Projects Outside Recommended Funding Range:

-

Outside Leverage	
Applicant is providing matching funds of at least 20% towards the total	Yes

eligible project costs?	
Matching cost detail	The proposed project funding is based upon a 30% match of the total project costs. This match comes from both cash and in-kind sources. The specifics of the match are as follows. The Adams County E911 Emergency Telephone Service Authority (Authority): The authority has dedicated $2,000,000 in cash towards the development of this project. These funds will be used for the core infrastructure (equipment purchase, fiber-optic network construction) of the project. These funds are specifically earmarked for the benefit of public safety communications and do not need to be repaid. An official resolution committing the funds can be found in the Supplemental Information uploads section. Adams County Communication Center: ADCOM 911 will provide both cash and in-kind assets towards the project. The cash match will be $150,000 and will be used towards the match of expansion on its primary facility. The cash will come from our Capital Reserves Fund that is designed to fund core infrastructure for the communications center. The in-kind match will be a combination of existing fiber-optic network infrastructure of $1,500,000 and existing radio tower resources of $750,000. All in-kind match assets are property owned solely by ADCOM 911. These assets fit the requirement of eligible expenses as they are directly related to the access and transport of the core network infrastructure. Denver International Airport: DIA will provide both cash and in-kind assets towards the project. The cash match will be in the amount of $650,000 and comes from funds already set aside for wireless data systems operations. The in-kind contribution of $650,000 is a combination of tower sites and fiber-optic network infrastructure. These assets fit the requirement of eligible expenses as they are directly related to the access and transport of the core network infrastructure.

	Jefferson County Emergency Communications Authority (JCECA): JCECA will provide $255,000 in cash towards the match for the proposed network. These funds will be taken from their general fund, intended to promote public safety communications and will not need to be repaid. A resolution committing the funds is included in the Supplemental Information uploads section.
Unjust enrichment	While this project itself has not, and will not apply for additional federal funds, one segment of the existing fiber network to be utilized was paid for by the ENHANCE 911 Act Grant from 2009. The specific segment was a four-block extension to tie the ADCOM 911 network to the City of Denver. The total monies received for the grant were $21,000 and that specific fiber segment was not factored in when determining the in-kind contribution of ADCOM 911.
Disclosure of federal and/or state funding sources	This project will not use any Federal or State funding sources.
Budget reasonableness	ADCOM 911 believes this project fulfills the reasonableness requirements for a number of reasons. -There are a limited number of vendors who offer the equipment necessary to deploy the required LTE networks and we have received cost estimates from three of the primary vendors. For each vendor we requested a detailed analysis that would estimate the required infrastructure to develop the network. The LTE equipment request is in-line with the vendors' estimates for both LTE equipment and supporting infrastructure. -For the non-LTE based equipment, ADCOM 911 has an established relationship with vendors and has negotiated significant discounts on all products included in the grant request. Additionally, all in-kind infrastructures being utilized (towers, fiber) have been purchased/developed through competitive pricing. - ADCOM 911 and DIA are using existing infrastructure wherever possible. For example, all proposed eNodeB sites will be located at existing tower locations, or utilize existing government, school and

	other public buildings requiring a minimal site preparation budget of $10,000 per site. Compare that to the average cost of $500,000 of developing new tower sites and this project is very cost effective. -Where applicable, ADCOM911 will utilize established governmental purchasing contracts for all equipment used in this project. When analyzing this project through the metric of cost per household, we will be providing all first responders within the jurisdiction a secure, reliable broadband network for $121 per household in Adams County.
Demonstration of need	The 700MHz LTE broadband network project proposed would not be possible without BTOP grant funding for several reasons. The primary reason being that ADCOM 911 is designed to be an operationally funded organization that makes no profit (we are a public entity, non-profit corporation) and maintains a limited fund balance. For the year ending December 31, 2009 our general fund cash balance was approximately $800,000 while the capital fund cash balance was approximately $450,000. Based on the budget attached, the resources available to ADCOM 911 are insufficient. Our primary source of capital investment is the E911 Authority, which is where a bulk of the cash match will come from. At the end of 2009, the authority had a fund balance of approximately $5,500,000 of which $1,500,000 is reserved for existing bonds issued by the Authority for previous renovation of ADCOM 911 facilities. Additionally, the ongoing capital requirements of the PSAP (phone system upgrades, IT and LMR system upgrades) are funded through this mechanism as well. By dedicating $2,000,000 towards the project, the authority is already maximizing its available resources. Currently, DIA/Technologies allocates approximately $150,000 Operations and Maintenance (O&M) funds per year for wireless systems. The O&M money is already budgeted for replacement radios, parts, licenses, engineering and test equipment. DIA has a capital improvement program which the Technologies Division has budgeted a total of $250,000 for 2010 and $400,000 in 2011 for a high-speed airport wide data system. The 2010 budget has already

	been partially allocated on finding frequencies (now approved through the FCC Waiver for 700 MHz) and technology selection through an engineering study. The $400,000 allocated for 2011 would be used primarily to extend the system begun in 2010. With grant funding, DIA will complete a campus-wide high-speed data system, interoperable with Adams County and standards compliant, in a maximum of three years. Without grant funding, the project will take a minimum of 10 years. In regards to alternative, cheaper solutions, ADCOM 911 has attempted to deploy other wireless systems that have proven to be woefully insufficient. The LTE technology, in conjunction with the allocation of 700 MHz spectrum is our only alternative to commercial carrier solutions. As pointed out, these other solutions do not meet public safety requirements or the minimum BTOP NOFA throughput.

Funds to States/Territories

States	Amount of Federal Grant Request
Colorado	13,882,091

Funds to States/Territories Total: $13,882,091

J. Historical Financials

Matching Funds			
	2007	**2008**	**2009**
Revenue	5,292,037	5,125,940	3,951,989
Expenditures	5,232,578	4,878,123	4,284,879
Net Assets	3,596,894	3,464,835	2,965,910
Change in Net Assets from Prior Year	638,074	-132,059	-498,925

Submitted Date:	**Easygrants ID: 7823**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** ADAMS COUNTY COMMUNICATIONS CENTER, INC.
Task: Submit Application - BTOP	**Applicant Name:** Mr. Brian Shepherd

Bond Rating (if applicable)			

K. Project Readiness

BTOP Organizational Readiness

If awarded the grant, ADCOM 911 and DIA will be in a solid position to immediately begin developing the proposed project and complete it within the three-year window provided. Both organizations have a strong history of designing, implementing and maintaining complex radio, network and data systems. In addition, ADCOM 911 and DIA have experienced management and financial personnel that will ensure all elements of the project are implemented in an orderly, timely fashion within the budget specified. Since both organizations are dependant on working with multiple areas and levels of government, both entities are well suited to ensure all intergovernmental agreements and contracts are executed and implemented.

ADCOM 911 currently employs three full time IT support personnel, two full time radio/wireless technicians as well as operational and management staff. The technical staff designed and implemented several large-scale projects, which give them a broad range of experience and expertise in implementing and managing broadband networks and data systems. Some of these projects include:

-The first 700MHz simulcast Land Mobile Radio system in the nation.

-Core contributors to the development and implementation of the statewide 700/800 MHz Digital Trunked Radio System covering all 64 counties within Colorado.

-Development of a secure wide area network connecting five individual law enforcement agencies, five fire agencies and 350 mobile data users.

-Implementation of a comprehensive law enforcement data system integrating Computer Aided Dispatch, Records and Jail Management Systems used by 2,000 law enforcement personnel.

ADCOM 911's management staff has extensive experience in budget management, financial planning and strategic planning. As a multi-agency support organization we have tremendous experience working with multiple agencies at all levels of government and developing multi-agency projects and agreements. We have financial experience with multiple funding sources including state and federal grants, bond issues and Emergency Telephone Surcharge revenues. In addition, management has successfully managed the integration of 6 law enforcement agencies into the statewide Coplink data sharing system.

DIA Technologies is the lead organization within DIA for implementing, installing, testing and operating the proposed LTE system. Specifically, the RF Radio and Wireless section will provide the day-to-day maintenance, care, monitoring and repair of the DIA sites. The Applications group will install, monitor and care for the applications using the system as detailed in other sections of this report. Users will report problems through the Technologies Help Desk. The Voice and Data Networks section maintains the fiber backhaul and will manage and monitor the Core network providing day-to-day monitoring.

Resumes of key individuals are included in the Management Team Resumes and Organizational Chart upload.

Construction and Vendor Contracts

The proposed ADCOM 911 and DIA project will rely on external vendors to provide a variety of products and services. The primary area in which these vendors will be utilized is the purchase and integration of the core LTE equipment and the associated network and computer equipment required to complete the network.

ADCOM 911 and DIA have met with and received three proposals from leading vendors for LTE equipment and integration (letters from each in the Supplemental Information uploads). Once the grant is awarded, ADCOM 911 and DIA will formalize a contract with one of the vendors. This process will be conducted through a competitive process. In addition to the LTE vendor, ADCOM 911 and DIA will rely on a variety of vendors that each organization already has existing relationships. These vendors include hardware resellers, software vendors and technical consulting firms. In each of these cases ADCOM 911 and DIA have extensive experience with the vendors and they provide unique perspectives to the organizations through past experience and knowledge of the systems. In each case, these vendors were selected through a competitive process and have moved into ongoing maintenance relationships with ADCOM 911 and DIA.

Letters of intent from some of these vendors have been included to show support for this specific project.

Customer Base

As Public Safety communications providers, ADCOM 911 and DIA's customer base are first responders from Law Enforcement, Fire/EMS, security and emergency response. While the

potential for wider use exists within the public safety realm, each agency's customer base will remain fairly constant.

ADCOM 911's existing customer base consists of Police, Fire and EMS personnel operating in the cities of Brighton, Commerce City, Federal Heights, Northglenn, and unincorporated Adams County. With an approximate count of 2,000, these first responders serve a county with a population of roughly 440,000 citizens, all of which are located within our service area.

The DIA users are typically a combination of first responder public safety users and security personnel. Airport police support all law enforcement activities throughout the airport property and are matrix officers from the City of Denver. DIA has four fire stations located on the airport and one on the access road to the airport (Pena Boulevard). These fire assets are dispatched from the City of Denver communications center and currently have little to no data transfer capability except through cellular data cards. The total number of DIA first responders is approximately 750.

The Airport Operations personnel have existing plans and procedures for mutual aid from surrounding municipalities such as Adams County and the City of Denver in response to major incidents such as the Continental 737 crash last year.

Licenses, Regulatory Approvals and Agreements

Per the FCC waiver granting access to the 700MHz spectrum, ADCOM 911, as the lead waiver recipient, will enter into a lease with the Public Safety Spectrum Trust (PSST), which holds the license to the 700 MHz Public Safety Broadband frequencies, as soon as the standard lease has been approved by appropriate government agencies. ADCOM 911 has already been in discussions with the PSST regarding the lease and foresees no issues with moving forward.

ADCOM 911 and DIA have identified up to 50 suitable sites to be used for the wireless LTE access sites. All of theses sites either:

-Are owned in full by ADCOM 911/DIA or in joint partnership with other agencies.

-Reside under the authority of agencies with which ADCOM 911 has existing partnerships.

Where applicable, tower lease agreements have been included as well as a preliminary site list.

Once the specific sites to be used are identified, ADCOM 911 and DIA will apply for any and all pertinent building permits where we anticipate significant work to take place. Expected reasons for permits include: site hardening, fiber optic cable builds and construction permits wherever site upgrades may be required. The facility where the core and major networking components would reside is entirely owned by ADCOM 911.

If specific microwave backhauls are required, ADCOM 911 and DIA will ensure all FCC required coordination and licensing takes place before the connections are implemented.

SPIN Number

L. Environmental Questionnaire

Project Description

This project will include the following construction activities:
Cherokee site (ASR#1224709): replacement of the existing shelter with a new prefabricated building; reinforcing the existing 150 foot tower to ensure it meets all required specifications (TIA/EIA-222-G) with the addition of the LTE 700 MHz antennas and transmission lines.
ADCOM911 site (ASR#1213685): remodeling the ADCOM911 building to create office space for additional personnel as well as a secure restricted access equipment room for the LTE Core and the Fiber optic equipment; upgrading the backup power generator to manage the additional load of the LTE and fiber optic equipment; strengthening the existing 200 foot tower to ensure it meets all specifications of TIA/EIA-222-G with the addition of the LTE 700 MHz equipment; and installing security fencing around the tower and equipment shelter.
Ladybird site (39-44-17.9N, 104-24-4.9W): upgrading the backup power generator to manage the additional load of the LTE equipment.
Dorothy Lane site (39-52-7.6N, 104-58-18.2W): strengthening the tower to ensure it meets all specifications of TIA/EIA-222-G with the addition of the LTE 700 MHz equipment; adding security features to the equipment shelter.
Construction for all other sites is expected to be additions of non-penetrating roof mounts for antenna/dish mounting; adding electrical power feeds and NEMA weather proof housings and/or adding antenna and transmission lines to existing tower structures.

Property Changes

All construction associated with this project is expected to be additions or modifications to existing building rooftops or existing tower structures except as follows.
The ADCOM911 constructions project will include remodeling of the existing building to create appropriate equipment areas with fiber optic access and office space for additional personnel. The project will also include fencing an area approximately 75 feet by 100 feet, replacement of an external generator, and reinforcement of the existing tower (ASR#1213685). This property is zoned as a Public District by Commerce City, CO.
The Cherokee tower site will require reinforcement of the existing tower (ASR#1224709) and the replacement of the existing equipment shelter. This site currently has three water tanks, a pumping station and the communications site however it is zoned R-1-B (residential single family) by the City of Northglenn.
The Ladybird site (39-44-17.9N, 104-24-4.9W) will require replacement of the backup power generator to manage the additional load of the LTE equipment. The Ladybird site is located on a Federal Highway Easement where the State of Colorado maintains a rest area at Interstate 70, exit 306.
The Dorothy Lane site (39-52-7.6N, 104-58-18.2W) will require security hardening of the existing shelter to meet required specifications. This site is an existing tower site on property with a city water tank zoned for single-family residence.

Buildings

The ADCOM911 remodeling will include remodeling approximately 3600 Square feet of the existing building into office space and equipment rooms to support fiber optic equipment, the LTE core equipment and applicable UPS/power equipment. The replacement building at the Cherokee site (ASR#1224709) will be a prefabricated 12ft X 20ft communications structure with internal generator. The Dorothy Lane site (39-52-7.6N, 104-58-18.2W) will require security hardening of the existing shelter such as lock replacements, access sensors and security cameras. No other building construction is expected as part of this project.

Wetlands

There is a wetland area to the northwest of ADCOM911 site (ASR#1213685). The proposed construction at this site will not involve any land excavation or affect the drainage into the wetland. There are no other wetlands near the proposed construction sites.

Critical Habitats

As the construction activities associated with this project are modifications of existing government operated properties, mostly buildings, there is no impact to critical habitats for any of the eight species listed on the "Threatened or Endangered Species List" as identified for Adams County Colorado by the U.S. Department of the Interior.

Floodplain

None of the proposed construction sites for this project are within the 100-year or 500-year flood plains as identified for Adams County or Denver County.

Protected Land

The construction activities included in this project will have no impact on any structure listed in the National Register of Historic Places as identified by the State Historic Preservation Office for Colorado.

Coastal Area

This project is not within the boundaries of a coastal zone management area (CZMA) as identified by the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management.

Brownfield

This project doesn't include construction within any Brownfield Zone identified in Adams or Denver County.

Submitted Date:	**Easygrants ID: 7823**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** ADAMS COUNTY COMMUNICATIONS CENTER, INC.
Task: Submit Application - BTOP	**Applicant Name:** Mr. Brian Shepherd

Uploads

The following pages contain the following uploads provided by the applicant:

Upload Name	File Name	Uploaded By	Uploaded Date
Service Offerings and Competitor Data	Service Offerings and Competitor Data.xls	Shepherd, Brian	06/29/2010
Network Diagram	Network Diagram.PDF	Shepherd, Brian	06/29/2010
Build Out Timeline	Build Out Timeline.doc	Shepherd, Brian	06/30/2010
List of Community Anchors and Points of Interest	List of Community Anchors and Points of Interest.xls	Shepherd, Brian	06/29/2010
Management Team Resumes and Organization Chart	Management Team Resumes and Organization Chart.pdf	Shepherd, Brian	06/30/2010
Government and Key Partnerships	Government and Key Partnerships.pdf	Shepherd, Brian	06/30/2010
Historical Financial Statements	Historical Financial Statements.pdf	Shepherd, Brian	06/24/2010
Budget Narrative	Budget Narrative.doc	Shepherd, Brian	06/30/2010

Submitted Date:	**Easygrants ID: 7823**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** ADAMS COUNTY COMMUNICATIONS CENTER, INC.
Task: Submit Application - BTOP	**Applicant Name:** Mr. Brian Shepherd

Detailed Budget	Detailed Budget.xls	Shepherd, Brian	06/30/2010
Pro-forma Forecast	Pro-forma Forecast.xls	Shepherd, Brian	06/30/2010
Subscriber Estimates	SubscriberEstimates.xlsx	Shepherd, Brian	06/24/2010
Dashboard Metrics	Dashboard Metrics.doc	Shepherd, Brian	06/30/2010
Service Area Data	Service Area Data.xls	Shepherd, Brian	06/24/2010
Network Maps	Network Map.pdf	Shepherd, Brian	06/29/2010
BTOP Certifications	BTOP Certifications.pdf	Shepherd, Brian	06/29/2010
SF-424 C and D	SF-424 C and D.pdf	Shepherd, Brian	06/30/2010
Supplemental Information	Supplimental Information.pdf	Shepherd, Brian	06/30/2010