



Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

Submitted Date: 3/26/2010 8:25:30 PM	Easygrants ID: 6251
Funding Opportunity: Broadband Technology Opportunities Program	Applicant Organization: CHARLOTTE, CITY OF
Task: Submit Application - BTOP	Applicant Name: James D Baucom

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A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
DUNS Number	071064166
CCR # (CAGE)	1KB98
Legal Business Name	CHARLOTTE, CITY OF
Point of Contact (POC)	DAVID EMERY 7043364039 Ext. demery@ci.charlotte.nc.us
Alternate POC	DAVID EMERY 7043364039 Ext. demery@ci.charlotte.nc.us
Electronic Business POC	DAVID EMERY 7043364039 Ext. demery@ci.charlotte.nc.us
Alternate Electronic Business POC	PEGGY RIBLETT 7043367907 Ext. pariblett@ci.charlotte.nc.us

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
Prefix	
First Name	James
Middle Name	D
Last Name	Baucom
Suffix	
Telephone Number	704-336-5349



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Fax Number	
Email	dbaucom@ci.charlotte.nc.us
Title	

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

Project Role	Name	Phone	Email
Secondary Point of Contact	Chuck L, Robinson	7044323539	clrobins@ci.charlotte.nc.us

Environmental Point of Contact

Prefix:	
Name:	Baucom, James
Suffix:	
Telephone Number:	7043365349
Title:	Network Technology Director

Organization Classification

Type of Organization	City or Township Government
Is the organization a small business?	No
Does the organization meet the definition of a socially and economically disadvantaged small business concern?	No

Authorized Organizational Representative

AOR Name	EMERY, DAVID
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Result	Applicant Authorized
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Project Title and Project Description

Project Title: CharMeck Connect

Project Description: CharMerk Connect is a public-private partnership to deploy middle mile broadband infrastructure in unserved and underserved areas. Funds will provide broadband access to residents, businesses, community anchor institutions, community colleges and public safety entities.

CCI Priority Checklist

The following items were selected from the CCI Priority Checklist:

1. This project will deploy Middle Mile broadband infrastructure to community anchor institutions.
2. The project will deploy Middle Mile broadband infrastructure and has incorporated a public-private partnership among government, non-profit and for-profits entities, and other key community stakeholders.
3. This project will deploy Middle Mile broadband infrastructure in economically distressed areas.
4. This project will deploy Middle Mile broadband infrastructure to community colleges.
5. This project will deploy Middle Mile broadband infrastructure to public safety entities.

Comprehensive Community Infrastructure Components

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

Middle Mile

BIP Applicants

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

- No



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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

B. Executive Summary, Project Purpose and Benefits



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Essay Question

Executive Summary of the proposed project:

CharMeck Connect is a middle-mile project, designed to deploy critical, middle-mile infrastructure in an effort to provide wireless, broadband access to the area's community anchor institutions, community colleges, libraries, housing entities, governing bodies and public safety agencies. The CharMeck network provides major benefits for public safety including increased bandwidth and anticipated lower monthly recurring costs. The additional bandwidth will allow public safety agencies a new ability to stream live video from first responders and provide situational awareness to our Communications Facilities, and command centers. With this network, designed to meet public safety needs during in even the most critical circumstances, public safety entities will always have priority. The project will be executed in cooperation with a commercial business partner, who will deploy LTE technology, provide system operation, maintenance support, provisioning, billing, and customer support. In addition, the project will address the sharing of networks, roaming, public safety priority of service, and provide a low cost tier of service for community colleges, schools, medical providers, community anchor institutions and libraries.

The 526 square-mile service area of Mecklenburg County has a population of 890,515 with 273,416 households and 28,305 businesses with an unemployment rate of over 12 percent. Over 62,000 area residents have lost their since the recession began. The service area includes 346 community anchor institutions including 3 community colleges, 176 K-12 schools, 24 libraries, 4 medical providers, 10 public safety entities and 75 other government facilities.

Each of the municipalities in the county Charlotte, Cornelius, Huntersville, Davidson, Matthews, Mint Hill, and Pineville will be provided service as part of the project with an estimated government subscriber rate of more than 9,000. Public safety organizations will have access to video streaming, the eventual integration into seamless command in a controlled environment with mapping, integrated CAD, and reporting.

In addition the two state colleges covered by the services area, the University of North Carolina Charlotte and Central Piedmont Community College, will have a potential subscriber rate of 77,000. Students at these institutions of higher learning will have increased access to online learning environments, the fastest growing service at each of the colleges and critical to the



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future success of our educational institutions and the marketability of our students in the job market.

A number of key institutions and organizations are partners in the CharMeck Connect project to provide support or access to future network subscribers. For example, Mecklenburg County is providing a trained and certified project manager to assist in project oversight, as well as being an anchor tenant that brings more than 4,800 subscribers. Other partners, who together will bring up to 70,000 subscribers include Central Piedmont Community College; Charlotte Housing Authority; Mecklenburg County Public Library, the University of North Carolina Charlotte, the Town of Cornelius, the Town of Matthews and Matthews Police Department, the Town of Davidson, and the Town of Huntersville.

The architecture of the proposed CharMeck Connect network is engineered to carry multiple applications simultaneously in complete security. This multi-service network provides critical communication circuits for schools, public safety backbones, government, SCADA, telemetry, video surveillance and broadband for residential and commercial users. This network will allow internet service providers and their residential customers, commercial customers, government, public safety, education and medical facilities to acquire broadband services. Our proposed network provides a level playing field for all.

Previously, public safety demanded its own network for control and reliability. Schools had a separate set of criteria to make sure they could receive e-Rate subsidies. There was no way dedicated and encrypted government connections could co-exist with residential broadband services. The proposed network and supporting architecture expansion and buildout allows the community to build and share one network that solves each of their connectivity needs. The design utilizes 30 total sites; 29 Fire Station sites and the North Site of the P25 Overlay. All sites have 80' monopole towers except for the North site which would be located at the 120' height. The system provides on-street and in-car portable coverage, 95% reliability (30 sites) modeling a 250mw in vehicle modem with external antenna. These system parameters are derived using a generic traffic model includes the following public safety applications: Text Messaging, Database Inquiries, Computer Aided Dispatch (CAD), Automatic Vehicle Location (AVL), Image Transfer (Mug-shots & Finger prints), and Field Based Reporting (FBR). Additionally, the traffic model also includes light usage of the following broadband applications: Email, Web Browsing (Intranet/Internet), and Streaming Video.



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The City of Charlotte has managed its finances carefully and conservatively throughout the current economic crisis. Each year has seen a significant decrease in expected revenue, yet the City has not had to lay off employees of significantly impact citizen services. In addition to being fiscally responsible, their experience, coupled with the experience of the commercial partner, ensures their ability to manage the implementation and ongoing operations of this project.

The CharMeck Connect project is requesting \$16,996,490 in broadband stimulus funds and will provide a 25.8% match of \$5,896,200 for a total project cost of \$22,892,690. Without the support of these stimulus funds, financial constraints will prohibit the implementation of this project and will leave the public safety entities and institutions of higher learning in our services area without the benefits associated with the project.

It is expected that the construction component of the CharMeck Connect project will create 10 jobs immediately, but the ongoing impact will be the jobs created by the services provider for the continued operations of the project. Jobs involved in the ongoing operations will include customer service reps, provisioning technicians, and system support technologists for a total of 14 newly created, long-term jobs.

Project purpose:

The CharMeck project purpose is to deploy affordable wireless broadband infrastructure in the City of Charlotte and to support broadband access to reduce disparities in access to lower-income users. CharMeck will: 1) provide improved access to underserved areas of the County by deploying the infrastructure to support multiple carriers; 2) create jobs in the near-term; 3) provide for the long-term economic growth; 4) provide affordable broadband services to the regions' community anchor institutions (schools, colleges, libraries, health care/medical facilities, job creating facilities); 5) deploy a wireless network resulting in enhanced public safety services for both voice and data communications; and 6) provide a communications platform reshaping how health care and education are delivered in the region.

Some areas of the region are unserved because private companies have found them to be economically unfeasible from a business perspective while other areas have limited broadband choices making service unaffordable for many.



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Deploying a regional broadband network will provide their residents access to the opportunities that high speed services provide - distance learning, job creation, economic growth, and telemedicine. The current lack of affordable broadband puts business and industry, as well as residents, at a distinct disadvantage in competing with neighboring areas.

Without this funding the City of Charlotte will not be able to provide this service. CharMeck will be a municipally owned Multi-service Carrier Grade Communications Network Broadband and will deploy broadband infrastructure in unserved and underserved areas, provide affordable and reliable broadband access to residents, businesses, community anchor institutions, agencies serving the unemployed, aged, low-income and public safety agencies. All segments of the population will be targeted for inclusion.

CharMerk's network addresses more than one statutory purpose. It will deploy a multi-service network to benefit the entire community with critical infrastructure to provide benefits, including: •Job Creation and Economic Growth •Benefits to Health Care, Education and Children •Support for Public Safety and Community Anchor Institutions •Reaching Vulnerable Populations, Socially and Economically Small Disadvantaged Businesses

Recovery Act and Other Governmental Collaboration:

Recovery Act and Other Governmental Collaboration

The proposed build-out and expansion of CharMeck Connect provides possible opportunities to enhance a variety of projects that are either underway or will be begin in the next few years. The Department of Energy is focusing a tremendous amount of resources on Smart Grid Technology, which gives both the utility and the customer the ability to communicate with each other. This technology can be layered over our existing infrastructure, eliminating the need for additional build-outs. Another important aspect of our collaboration model provides our Public Safety Community access to applications such as mobile data, which gives them access to high-speed connectivity in every police and fire vehicle, creating a safer environment for our public safety forces. It also provides them with real-time streaming video which allows them to see what is happening while in route to an incident, and allows dispatch to monitor the location of each vehicle through a sophisticated AVL tracking device. The Department of Transportation is looking at Intelligent Roadways to decrease gridlock and make our highways and local streets more efficient. This technology can also be layered with security and sovereignty over our core infrastructure, avoiding costly duplication. A Public Housing model will provide free or low-cost



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internet access to the elderly, low income families or those E-Rate students in subsidized housing. In addition, SWC network have the ability to provide a limitless number of Virtual Private Networks, allowing partners to work with governmental agencies with the need for a robust wireless platform.

Fit with BTOP CCI Priorities:

CharMeck project fits all seven CCI Priorities.

1. CharMeck provides for the deployment of a wireless network over the entire service area of 527 square miles for a population of 890,515 people, 273,416 households, 28,305 businesses and 346 Community Anchor institutions and public safety entities with an unemployment rate of over 12%.
2. CharMeck has worked closely with the public, private and non-profit sectors in planning and developing an economically feasible and robust open access broadband network. Community colleges, libraries, municipalities, public safety, the housing authority, private and the non-profit sectors have been active participants in the process. Letters of support from CharMeck partners are included with this application.
3. Charlotte is one of the most economically distressed regions in the country. Unemployment has soared to over 12% and over 62,000 people have lost their jobs since the recession began. Lack of broadband availability and affordability by the residents of communities adversely affects their ability to obtain employment. It is vital that the unemployed maintain daily connection to the job matching system to monitor job listings and apply to available jobs immediately. Broadband is critical to improve the lives of individuals, including addressing the development of technology. Industry development is dependent on quality of workforce. Deployment of broadband technology will make available long-distance learning and occupational skills training. Workforce solutions maximize the opportunities provided by the community colleges, but realize that the non-traditional student requires access and computer-based study from home or community centers. CharMeck broadband will increase the access speed in workforce centers, housing units, libraries, and other outreach agencies and support more robust telecommunications capacity, reducing wait time for computer access. These improvements will make it possible to help more people acquire and increase computer skills, develop professional resumes, search and apply for jobs, take distance learning courses, work toward receiving a GED or other educational certification, access e-government services, and much more.



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4. All 3 community colleges in the region are members of CharMeck consortium. Increased capacity of CharMeck network will allow them to offer more courses and more diverse training in rural areas of region while increasing productivity.

5. CharMeck services will be accessible to all public safety entities in the area. Public safety agencies will benefit from CharMeck with increased bandwidth and lower monthly recurring costs. Additional bandwidth will enhance capacity to stream live video from and to first responders, provide situational awareness to communications and emergency management facilities and to command centers. It will further the goal of interoperability for public safety and enhance fire departments capabilities.

6. Last Mile vendors are committed to utilize the middle mile components. There are no last mile costs to the CharMeck project.

7. CharMeck has committed to provide a 25.8% match to deploy middle mile broadband infrastructure.

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

- No

Is the applicant delinquent on any federal debt?

- No

If Yes, justification for delinquency:

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

If YES, key partners are listed below:



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<p>Project Role: Third party in-kind contributor Name: Pinkard, Jerry Phone: 7043362891 Email: Jerry.Pinkard@mecklenburgcountync.gov Address 1: 600 E 4th Street Address 2: Address 3: City: Charlotte State: North Carolina Zip Code: 28202 Organization: Mecklenburg County Organization Type: County Government Small business: No Socially and economically disadvantaged small business concern: No</p>
<p>Project Role: Other Name: Rahman, Malik Phone: 7043306598 Email: malik.rahman@CPCC.edu Address 1: PO Box 35009 Address 2: Address 3: City: Charlotte State: North Carolina Zip Code: 28235 Organization: Central Piedmont Community College Organization Type: Non-profit Institution Small business: No Socially and economically disadvantaged small business concern: No</p>
<p>Project Role: Other Name: Staley, Ralph Phone: 7043365346 Email: rstaley@cha-nc.org Address 1: 1301 South Blvd. Address 2: Address 3: City: Charlotte State: North Carolina Zip Code: 28203 Organization: Charlotte Housing Authority Organization Type: Non-profit Association</p>



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Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Other
Name: Blair, Frank
Phone: 7044160403
Email: fblair@plcmc.org
Address 1: 310 N. Tryon Street
Address 2:
Address 3:
City: Charlotte
State: North Carolina
Zip Code: 28202
Organization: Mecklenburg County Public Library
Organization Type: County Government
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Other
Name: Dominick, Jay
Phone: 7046878483
Email: jdominick@unc.edu
Address 1: UNC Charlotte
Address 2: Information & Technology Serv.
Address 3:
City: Charlotte
State: North Carolina
Zip Code: 28223
Organization: University of North Carolina Charlotte UNCC
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Other
Name: Grant, Andrew
Phone: 7048926031
Email: agrant@cornelius.org
Address 1: PO Box 399
Address 2:
Address 3:
City: Cornlius
State: North Carolina



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<p>Zip Code: 28031 Organization: Town of Cornelius Organization Type: City or Township Government Small business: No Socially and economically disadvantaged small business concern: No</p>
<p>Project Role: Other Name: Griffin, Larry Phone: 7048474069 Email: lgriffin@matthewspolice.org Address 1: 1201 Crews Road Address 2: Address 3: City: Matthews State: North Carolina Zip Code: 28105 Organization: Town of Matthews Matthews Police Organization Type: City or Township Government Small business: No Socially and economically disadvantaged small business concern: No</p>
<p>Project Role: Other Name: Brice, Leamon Phone: 7048927591 Email: lbrice@ci.davidson.nc.us Address 1: 216 South Main Street Address 2: Address 3: City: Davidson State: North Carolina Zip Code: 28036 Organization: Town of Davidson Organization Type: City or Township Government Small business: No Socially and economically disadvantaged small business concern: No</p>
<p>Project Role: Other Name: Ferguson, Greg Phone: 7048756541 Email: gferguson@huntersville.org Address 1: 101 Huntersville-Concord Road Address 2:</p>



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Address 3:
City: Huntersville
State: North Carolina
Zip Code: 28070
Organization: Town of Huntersville
Organization Type: City or Township Government
Small business: No
Socially and economically disadvantaged small business concern: No

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

Mecklenburg County is providing a trained and certified project mananager to assist in project oversight. They are also an anchor tenant that brings over 4800 subscribers. The remainder of the listed anchor tenants will bring up to 70,000 subscribers to the network.

D. Congressional Districts

Applicant Headquarters

- North Carolina

Project Service States

North Carolina

Project Service Areas

North Carolina - 8

North Carolina - 9

North Carolina - 12

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



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➤ 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

Service Area Type: Middle Mile
Service Area Name: Mecklenburg County
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Served

If Service Status is "Underserved" please select at least one applicable option from this list.

Total Square Miles in Service Area: 527
Total Population in Proposed Service Area: 890,515
Total Number of Households in Service Area: 273,416
Total Number of Businesses in Service Area: 28,305
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 346
Unemployment Rate in the Service Area: 11
Median Income in the Service Area: 57,293
Estimated Percentage of Households with Access to Broadband: 95
Estimated Percentage of Households Subscribing to Broadband: 85



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F. Community Anchor Summary

Community Anchor Summary	
Schools (k-12)	176
Libraries	24
Medical and Healthcare Providers	4
Public Safety Entities	10
Community Colleges	3
Public Housing	52
Other Institutions of Higher Education	2
Other Community Support Organization	0
Other Government Facilities	75
TOTAL COMMUNITY ANCHOR INSTITUTIONS	346
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	0



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SERVING INSTITUTIONS	
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G. Project Benefits

Demographics	
Jobs	
How many direct jobs-years will be created from this project?	10
How many indirect jobs will be created from this project?	14
How many jobs will be induced from this project?	90

Methodology used to estimate jobs:

It is expected that the construction component, while not the major cost, will require two teams of 5 minimally in order to meet our timeline. The remainder of the jobs will be created through the service provider. Those will entail customer service reps, provisioning technicians, and system support technologists. To support customer environment the provider will minimally need 10 support specialists in order to staff two on duty 24 hours a day. Support technicians will require no more than 4 to provide 7 X 24 support.

Project Impact:

Project Impacts to the CharMeck Connect Region

CharMeck Connect will deploy wireless broadband infrastructure throughout the County that will 1) provide broadband access to the unserved, 2) provide enhanced and affordable access to the underserved by deploying the infrastructure to support multiple carriers, 3) create jobs in the near term and provide for the long term economic growth of the region 4) provide reliable and affordable broadband connectivity to the community anchor institutions (community colleges, universities, K-12 schools, healthcare facilities, job creating facilities) 5) provide enhanced and secure services for voice and data public safety communications.

CharMeck Connect network includes a single infrastructure that supports multiple users and multiple applications, securely and effectively. The platform provides the following capabilities: *Architecture Benefits *Carrier Grade *Multi-Service *Prioritization *Network Control and Ownership *True Open Access Model *Technology and Application Flexible Architecture Benefits: With the use of superior backbone infrastructure and the impressive coverage ability of licensed and license-exempt microwave technology, entire geographic areas can be "wired". This



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allows for robust, multi-service communications at a fraction of the capital expenditure necessary to deploy traditional copper or fiber optic networks.

CharMeck Connect network will provide students at the two state colleges covered by the services area, the University of North Carolina Charlotte and Central Piedmont Community College, with increased access to online learning environments, the fastest growing service at each of the colleges and critical to the future success of our educational institutions and the marketability of our students in the job market.

Vulnerable Populations:

Vulnerable population's include:

1. Seniors: Senior Citizens frequently need help with basic computer skills training, social networking and access to government services. This population uses computers extensively when broadband access is available. Studies indicate that they need computer training and broadband access so that they remain active in the workforce, engage in their communities and supportive of the local economy.
2. Broadband access and ESL is needed for a growing Hispanic population to aid in citizenship and GED training in locally relevant languages to this vulnerable group. Learning English is one of the quickest ways to assimilate into the American melting pot, and the first step on the path to citizenship for many.
3. Disabled: Facilitate and agencies for disabled need broadband to provide support to this population with access to government services, educational content and training.
4. Unemployed/low income: Finding and applying for jobs, maintaining contact with employers, training to find better jobs and other basic aspects of employment are increasingly Internet based, leaving those without access or only intermittent access at a serious disadvantage. These problems are exacerbated by low Internet proficiency and limited English literacy. Across Charlotte, residents look for jobs, file for unemployment, apply for jobs and create resumes at computer centers.

Level of Need:

CharMeck Connect is a middle-mile project, designed to deploy critical, middle-mile infrastructure (fiber optic network) in an effort to provide wireless, broadband access to the public safety and municipal agencies and educational institution of the 526 square-mile service area of Mecklenburg County. The area has a population of 890,515 with 273,416 households and 28,305 businesses. Currently, the unemployment rate in the services area is at 11 percent and includes 346 public safety entities and community anchor institutions including 3 community



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colleges, 176 K-12 schools, 24 libraries, and 4 medical providers, 10 public safety entities and 75 other government facilities.

Previously, public safety demanded its own network for control and reliability and schools had a separate set of criteria to make sure they could receive e-Rate subsidies. There was no way dedicated and encrypted government connections could co-exist with residential broadband services. The proposed network, supporting architecture expansion and build-out allows the community to build and share one network that solves each of their connectivity needs. In addition, CharMeck Connect will provide public safety organizations with access to video streaming, the eventual integration into seamless command in a controlled environment with mapping, integrated CAD, and reporting. This will not only provide a safer environment for our public safety officers, but will allow them to better protect the population which they serve in our community.

The proposed system will also provide students at the two state colleges covered by the services area, the University of North Carolina Charlotte and Central Piedmont Community College, with increased access to online learning environments, the fastest growing service at each of the colleges and critical to the future success of our educational institutions and the marketability of our students in the job market.

This project will allow other broadband and Internet providers, some of whom have a limited presence in our area, to expand their networks and provide high speed, fiber based broadband to other anchor institutions and our community. CharMerck Connect cannot make the needed investment in the middle mile infrastructure without the stimulus broadband grant funding, but we believe this project is critical to our community in order to provide our public safety organizations and higher-education institutions with the tools they need to be productive and position our community to be competitive moving forward.

H. Technology

Technology Type

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

Wireless - Terrestrial Mobile



**Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program**

Submitted Date: 3/26/2010 8:25:30 PM	Easygrants ID: 6251
Funding Opportunity: Broadband Technology Opportunities Program	Applicant Organization: CHARLOTTE, CITY OF
Task: Submit Application - BTOP	Applicant Name: James D Baucom

Other:

Technology Questions

Methodology for Area Status:

- None.

Description of Network Openness:

Multi-service Network

The architecture of the proposed Char Mack network is engineered to carry multiple applications simultaneously in complete security. This multi-service? network provides critical communication circuits for schools, public safety backbones, government, SCADA, telemetry, video surveillance and broadband for residential and commercial users.

Network within the Network

The implementation of this multi-service network includes the ability for service operators, such as ISP's and wholesale carriers, to provide residential and commercial broadband service. Each service operator establishes its own ?network within the network, using VLAN tagging and a variety of other enabling technologies, to provision services to its own customers. On a customer by customer basis, the service operator can monitor performance, turn service on or off, control speed and volume and for all practical purpose operate as a standalone network. The service operator can acquire their Internet access from any wholesale vendor and use that Internet access to provision their customers. It is possible that two different service operators using the same proposed network, could purchase different wholesale internet connections, setup different customer performance criteria (speeds, content and volume) resulting in their customers having entirely different experiences. Each individual service operator is limited to the overall bandwidth it has contracted and will not be able to disrupt the performance of a competitor, even when the customers are right next door.

The proposed CST architecture eliminates traditional communication silos. Previously, public safety demanded its own network for control and reliability. Schools had a separate set of criteria to make sure they could receive e-Rate subsidies. There was no way dedicated and encrypted government connections could co-exist with residential broadband services. The proposed network and supporting architecture expansion and buildout allows the community to build and share one network that solves each of their connectivity needs.



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Open Access

This network will allow internet service providers and their residential customers, commercial customers, government, public safety, education and medical facilities to acquire broadband services. Our proposed network provides a level playing field for all.

These nondiscrimination and interconnection requirements apply to the grantee, and do not apply to any existing network arrangements or to non-awardees using the network. However, the grantee may negotiate contractual covenants with broadband service providers to deploy or operate the network facilities and pass these conditions through to them. The grantee will have in place safeguards to ensure that the network nondiscrimination and interconnection obligations are met.

System Design:

The design utilizes 30 total sites; 29 Fire Station sites and the North Site of the P25 Overlay. All sites have 80' monopole towers except for the North site which would be located at the 120' height. The system provides on-street and in-car portable coverage, 95% reliability (30 sites) modeling a 250mw in vehicle modem with external antenna. These system parameters are derived using a generic traffic model from Motorola which is considered representative of typical public safety usage. The traffic model includes the following public safety applications:

- a) Text Messaging
- b) Database Inquiries
- c) Computer Aided Dispatch (CAD)
- d) Automatic Vehicle Location (AVL)
- e) Image Transfer (Mug-shots & Finger prints)
- f) Field Based Reporting (FBR)

Additionally, the traffic model also includes light usage of the following broadband applications:

- g) Email
- h) Web Browsing (Intranet/Internet)
- i) Streaming Video \

Ethernet bridges can deliver 99.999% availability in even the most challenging environments. Plus, they're cost-effective, faster to deploy and easier to manage than comparable systems. They offer more capacity and higher signal quality over greater range – even over water. And they



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provide greater spectral efficiency, which allows high performance in areas with congested radio communications.

Operating in the 5.8 GHz, 5.4 GHz and 4.9 GHz (public safety) frequencies, the Motorola 600 point-to-point wireless Ethernet bridges can deliver up to 99.999% availability in even the most challenging situations – in non-line-of-sight environments, over long distances, and across water and open terrain.

Fire Station 8	35 13' 06" N	80 48' 39" W	80
Fire Station 1035	13' 27" N	80 53' 13" W	80
Fire Station 1135	15' 05" N	80 49' 29" W	80
Fire Station 1235	10' 24" N	80 52' 30" W	80
Fire Station 1335	15' 27" N	80 53' 31" W	80
Fire Station 1435	10' 33" N	80 47' 51" W	80
Fire Station 1535	14' 14" N	80 46' 30" W	80
Fire Station 1635	08' 24" N	80 50' 52" W	80
Fire Station 1735	12' 48" N	80 55' 56" W	80
Fire Station 1935	08' 17" N	80 46' 55" W	80
Fire Station 2035	07' 45" N	80 53' 33" W	80
Fire Station 2135	15' 53" N	80 56' 24" W	80
Fire Station 2235	17' 22" N	80 47' 46" W	80
Fire Station 2335	13' 09" N	80 43' 25" W	80
Fire Station 2435	05' 15" N	80 50' 20" W	80
Fire Station 2535	18' 29" N	80 54' 42" W	80
Fire Station 2635	08' 03" N	80 56' 21" W	80
Fire Station 2835	19' 54" N	80 49' 34" W	80
Fire Station 2935	09' 52" N	80 44' 15" W	80
Fire Station 3135	22' 26" N	80 45' 51" W	80
Fire Station 3235	02' 42" N	80 49' 31" W	80
Fire Station 3335	18' 54" N	80 57' 52" W	80
Fire Station 3435	16' 33" N	80 43' 03" W	80
Fire Station 3535	19' 20" N	80 42' 43" W	80
Fire Station 3635	20' 14" N	80 45' 39" W	80
Fire Station 3735	05' 46" N	81 00' 08" W	80
Fire Station 3835	08' 41" N	81 00' 14" W	80



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Fire Station 3935 05' 36" N 80 46' 36" W 80
 Fire Station 4035 14' 23" N 80 39' 58" W 80
 North Tower 35 25' 43" N 80 53' 39" W 120

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	0	0
Middle Mile	16,996,490	5,896,200
Total	16,996,490	5,896,200

Project Budget Total: \$22,892,690

Match Percent: 25.8%

Projects Outside Recommended Funding Range:

- None

Outside Leverage																										
Applicant is providing matching funds of at least 20% towards the total eligible project costs?	Yes																									
Matching cost detail	Salaries for Project Team necessary to oversee the project. <table border="0"> <tr> <td>Project Title</td> <td>Organization</td> <td>Postion</td> <td>Rate</td> <td>Hours</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> </tr> <tr> <td>Project Lead</td> <td>City of Charlotte</td> <td>Network Technology Director</td> <td></td> <td></td> </tr> <tr> <td>\$98</td> <td>2080</td> <td>\$203,840</td> <td></td> <td></td> </tr> <tr> <td>Project Manager</td> <td>Mecklenburg County</td> <td>Project Manager</td> <td></td> <td></td> </tr> </table>	Project Title	Organization	Postion	Rate	Hours	Total					Project Lead	City of Charlotte	Network Technology Director			\$98	2080	\$203,840			Project Manager	Mecklenburg County	Project Manager		
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	<p>\$92 2080 \$191,360</p> <p>Each site will require the long term lease of property for the location of tower sites. The cost is calculated using the market rate X Initial lease term.</p> <table border="1"> <thead> <tr> <th>Facility</th> <th>Organization</th> <th>Address</th> <th>Market Rate</th> </tr> </thead> <tbody> <tr> <td>Sugar Creek Tower</td> <td>City of Charlotte</td> <td>4780 Reagan Drive</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>Matthews Tower</td> <td>City of Charlotte</td> <td>561 Team Road</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>North Meck Tower</td> <td>City of Charlotte</td> <td>7980 Babe Stillwell</td> <td>\$2,400.00</td> </tr> <tr> <td>60</td> <td></td> <td>\$144,000</td> <td></td> </tr> <tr> <td>Belhaven Tower</td> <td>City of Charlotte</td> <td>5200 Brookshire Blvd</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>Tyvola Tower</td> <td>City of Charlotte</td> <td>5731 Closeburn Drive</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>CMGC</td> <td>City of Charlotte</td> <td>600 East Fourth St</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>Training Academy</td> <td>City of Charlotte</td> <td>1770 Shopton Road</td> <td></td> </tr> <tr> <td>\$2,400.00</td> <td>60</td> <td>\$144,000</td> <td></td> </tr> <tr> <td>CFD Station 1</td> <td>City of Charlotte</td> <td>221 North Myers St</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 2</td> <td>City of Charlotte</td> <td>1817 South Boulevard</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 3</td> <td>City of Charlotte</td> <td>6512 Monroe Road</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 4</td> <td>City of Charlotte</td> <td>525 North Church St</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 5</td> <td>City of Charlotte</td> <td>224 Wesley Heights</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 6</td> <td>City of Charlotte</td> <td>249 S Laurel Ave</td> <td>\$1,800.00</td> </tr> <tr> <td>60</td> <td></td> <td>\$108,000</td> <td></td> </tr> <tr> <td>CFD Station 7</td> <td>City of Charlotte</td> <td>3210 N Davidson St</td> <td></td> </tr> <tr> <td>\$1,800.00</td> <td>60</td> <td>\$108,000</td> <td></td> </tr> </tbody> </table>	Facility	Organization	Address	Market Rate	Sugar Creek Tower	City of Charlotte	4780 Reagan Drive		\$2,400.00	60	\$144,000		Matthews Tower	City of Charlotte	561 Team Road		\$2,400.00	60	\$144,000		North Meck Tower	City of Charlotte	7980 Babe Stillwell	\$2,400.00	60		\$144,000		Belhaven Tower	City of Charlotte	5200 Brookshire Blvd		\$2,400.00	60	\$144,000		Tyvola Tower	City of Charlotte	5731 Closeburn Drive		\$2,400.00	60	\$144,000		CMGC	City of Charlotte	600 East Fourth St		\$2,400.00	60	\$144,000		Training Academy	City of Charlotte	1770 Shopton Road		\$2,400.00	60	\$144,000		CFD Station 1	City of Charlotte	221 North Myers St		\$1,800.00	60	\$108,000		CFD Station 2	City of Charlotte	1817 South Boulevard		\$1,800.00	60	\$108,000		CFD Station 3	City of Charlotte	6512 Monroe Road		\$1,800.00	60	\$108,000		CFD Station 4	City of Charlotte	525 North Church St		\$1,800.00	60	\$108,000		CFD Station 5	City of Charlotte	224 Wesley Heights		\$1,800.00	60	\$108,000		CFD Station 6	City of Charlotte	249 S Laurel Ave	\$1,800.00	60		\$108,000		CFD Station 7	City of Charlotte	3210 N Davidson St		\$1,800.00	60	\$108,000	
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CFD Station 8	City of Charlotte	1201 The Plaza	\$1,800.00	60	\$108,000
CFD Station 9	City of Charlotte	4529 McKee Road	\$1,800.00	60	\$108,000
CFD Station 10	City of Charlotte	2810 Wilkinson Blvd	\$1,800.00	60	\$108,000
CFD Station 11	City of Charlotte	620 West 28th Street	\$1,800.00	60	\$108,000
CFD Station 12	City of Charlotte	420 Inwood Drive	\$1,800.00	60	\$108,000
CFD Station 13	City of Charlotte	4337 Glenwood Drive	\$1,800.00	60	\$108,000
CFD Station 14	City of Charlotte	114 North Sharon Rd	\$1,800.00	60	\$108,000
CFD Station 15	City of Charlotte	3617 Frontenac Ave	\$1,800.00	60	\$108,000
CFD Station 16	City of Charlotte	6623 Park South Dr	\$1,800.00	60	\$108,000
CFD Station 17	City of Charlotte	5308 Morris Field Dr	\$1,800.00	60	\$108,000
CFD Station 18	City of Charlotte	2337 Keller Avenue	\$1,800.00	60	\$108,000
CFD Station 19	City of Charlotte	1016 Sardis Lane	\$1,800.00	60	\$108,000
CFD Station 20	City of Charlotte	9400 Nations Ford Rd	\$1,800.00	60	\$108,000
CFD Station 21	City of Charlotte	1023 Little Rock Rd	\$1,800.00	60	\$108,000
CFD Station 22	City of Charlotte	1917 W Sugar Creek	\$1,800.00	60	\$108,000
CFD Station 23	City of Charlotte	7400 E WT Harris Bd	\$1,800.00	60	\$108,000
CFD Station 24	City of Charlotte	7132 Hwy 51	\$1,800.00	60	\$108,000
CFD Station 25	City of Charlotte	6741 Pleasant Grove Rd			



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	\$1,800.00	60	\$108,000		
	CFD Station 26			City of Charlotte	9231 South Tryon St
	\$1,800.00	60	\$108,000		
	CFD Station 27			City of Charlotte	111 Ken Hoffman Dr
	\$1,800.00	60	\$108,000		
	CFD Station 28			City of Charlotte	8031 Old Statesville
	\$1,800.00	60	\$108,000		
	CFD Station 29			City of Charlotte	2121 Margaret Wallace
	\$1,800.00	60	\$108,000		
	CFD Station 30			City of Charlotte	4707 Belle Oaks Drive
	\$1,800.00	60	\$108,000		
	CFD Station 31			City of Charlotte	3820 Ridge Road
	\$1,800.00	60	\$108,000		
	CFD Station 32			City of Charlotte	9225 Bryant Farms Road
	\$1,800.00	60	\$108,000		
	CFD Station 33			City of Charlotte	2001 Mt.Holly-Hntrsvle
	\$1,800.00	60	\$108,000		
	CFD Station 34			City of Charlotte	2824 Rocky River Road
	\$1,800.00	60	\$108,000		
	CFD Station 35			City of Charlotte	1120 Pavilion Boulevard
	\$1,800.00	60	\$108,000		
	CFD Station 35			City of Charlotte	2325 W Mallard Crk
	\$1,800.00	60	\$108,000		
	CFD Station 37			City of Charlotte	13828 South Tryon St
	\$1,800.00	60	\$108,000		
	CFD Station 38			City of Charlotte	12100 Shopton Road
	West	\$1,800.00	60	\$108,000	
	CFD Station 39			City of Charlotte	8325 Providence Road
	\$1,800.00	60	\$108,000		
	CFD Station 40			City of Charlotte	9720 Harrisburg Road
	\$1,800.00	60	\$108,000		
	Freedom Center			Mecklenburg County	Freedom Mall
	\$1,800.00	60	\$108,000		



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	\$5,831,200
Unjust enrichment	None
Disclosure of federal and/or state funding sources	None
Budget reasonableness	This project has no last mile component. The entire project has been designed and the proposal developed with through the support of profession engineering resources and review by the all prospective partners. All have reach the same budget estimates independently.
Demonstration of need	The City of Charlotte has managed its finances carefully and conservatively throughout the current economic crisis. Each year has seen a significant decrease in expected revenue, yet the City has not had to lay off employees of significantly impact citizen services. If not funded throught his grant this project will not be allowed to move forward due lack of funding.

Funds to States/Territories

States	Amount of Federal Grant Request
North Carolina	16,996,490

Funds to States/Territories Total: \$16,996,490

J. Historical Financials

Matching Funds			
	2007	2008	2009
Revenue	1,771,005,000	1,744,587,000	1,904,328,000
Expenditures	1,128,937,000	1,230,518,000	1,292,239,000



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Net Assets	7,102,296,000	7,616,365,000	8,228,454,000
Change in Net Assets from Prior Year	642,068,000	514,069,000	612,089,000
Bond Rating (if applicable)	AAA	AAA	AAA

K. Project Readiness

BTOP Organizational Readiness

This project is focused to delivery of wireless broadband services to Pubilc Safety and municipal agencies. This project will be executed in conjunction with a commercial business partner using the same LTE technology. The selected business partner will provide system operation,maintenance support, provisioning, biling, and customer support. Additionally the agreement will address the sharing of networks, roaming,publc safety priority of service. and a low cost tier of service for educational institutions.

Construction and Vendor Contracts

This will rely completely on contracts for its completion. Initial discussions have discussions have been conducted with four interested companies. The RFP for this project is expected to be released within 30 days.

Signed contracts are not available since this project can not proceed without grant funding.

Customer Base

The primary customer base for this project is publc safety, municipal government, and educations. The current public safety user base in the service area is 6800. The two public universities are a projecting potential user base in excess of 70,000.

Licenses, Regulatory Approvals and Agreements

This will require the granting of an already submitted 700 MHz waiver and execution of the necessary 5 year leases for the tower locations.



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SPIN Number

L. Environmental Questionnaire

Project Description

This project has contains the constuction of 26 monopole towers at existing fire stations to support the deployment of wireless broadband antennas and backhaul systems.

Property Changes

No clearing of land is expected. The construction of monopole antennas will be restricted to alread cleared property that has fire stations or other municipal owned buildings already constructed.

Buildings

This project has no buildig construction components. It will entail the placement of monopole strucuters at existing fire stations and antennas on existing tower sites.

Wetlands

NONE

Critical Habitats

NONE

Floodplain

None

Protected Land

NONE



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Coastal Area

N/A

Brownfield

NONE



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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	CCI Service Offerings.xlsx	Baucom, James	03/24/2010
Network Diagram	Visio-Charlotte Wireless Data Diagram 3_22_10.pdf	Baucom, James	03/24/2010
Build Out Timeline	Project Plan and Build-out Timeline.docx	Baucom, James	03/24/2010
Build Out Timeline	Project Plan and Build-out Timeline.docx	Baucom, James	03/22/2010
List of Community Anchors and Points of Interest	CCI Anchor and POI.xlsx	Baucom, James	03/22/2010
Management Team Resumes and Organization Chart	Org Chart.pdf	Baucom, James	03/26/2010
Management Team Resumes and Organization Chart	Project Resumes.pdf	Baucom, James	03/26/2010
Government and Key	Letters of Support.pdf	Baucom, James	03/22/2010



**Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program**

Submitted Date: 3/26/2010 8:25:30 PM		Easygrants ID: 6251	
Funding Opportunity: Broadband Technology Opportunities Program		Applicant Organization: CHARLOTTE, CITY OF	
Task: Submit Application - BTOP		Applicant Name: James D Baucom	

Partnerships			
Historical Financial Statements	CoC Financial report FY09.pdf	Baucom, James	03/22/2010
Historical Financial Statements	FY08 Financial report.pdf	Baucom, James	03/22/2010
Budget Narrative	Budget narrative.docx	Baucom, James	03/25/2010
Detailed Budget	Detailed Budget.xlsx	Baucom, James	03/25/2010
Pro-forma Forecast	ProForma.xlsx	Baucom, James	03/26/2010
Subscriber Estimates	Subscriber Estimates.xlsx	Baucom, James	03/24/2010
Dashboard Metrics	Metrics.docx	Baucom, James	03/26/2010
Service Area Data	Service Area Census Tract.xlsx	Baucom, James	03/26/2010
Network Maps	Coverage Map and sites.pdf	Baucom, James	03/24/2010
BTOP Certifications	Certification.pdf	Baucom, James	03/26/2010
SF-424 C and D	SF-424D.pdf	Baucom, James	03/26/2010



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