



**CONNECTIONS**  
A DIVISION OF JKM CONSULTING, INC.

*Project BEAR (Broadband for East Alabama Region)*

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# REQUEST FOR QUOTE

## Wireless Network Design



**BROADBANDUSA**  
CONNECTING AMERICA'S COMMUNITIES

## TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND .....	3
ABOUT THE PROJECT	
ORGANIZATION HISTORY	
ADMINISTRATIVE .....	4
CONTACT INFO	
DUE DATES	
SCHEDULE	
GUIDELINES FOR QUOTE SUBMISSION.....	5
QUOTE SUBMISSION	
TECHNICAL SPECIFICATIONS	
DETAILED RESPONSE REQUIREMENTS .....	9
SUMMARY	
DETAILED AND ITEMIZED PRICING	
COMPANY OVERVIEW	
EVALUATION FACTORS .....	10
CRITERIA	

## INTRODUCTION AND BACKGROUND

### ABOUT THE PROJECT

In the rural, economically distressed east-central Alabama region that includes Calhoun, Talladega, Clay, and Randolph Counties, many valuable community organizations rely on slower, copper-based service for their Internet access, and some have no broadband service at all. JKM Consulting's Project BEAR proposes to deploy a 176-mile fiber network that includes 88 miles of new fiber to provide high-speed, affordable broadband services and directly connect more than 40 community anchor institutions in the four-county region. The project also plans to deploy six wireless access points to facilitate last-mile consumer service in isolated rural areas like Fort McClellan in Anniston, Alabama, and the Talladega National Forest. The project intends to bring fiber to local Public Safety Access Points and other emergency agencies, and strengthen healthcare delivery by connecting rural hospitals such as Clay County and Wedowee Hospital to urban hospitals, enabling telemedicine services such as participation in the Alabama Pediatric Network. The project also expects to enhance local educational opportunities by connecting six community centers, increasing the quality of local after-school and homework programs.

*Project BEAR also proposes to:*

- Connect as many as 44 community anchor institutions with speeds between 100 Mbps and 1 Gbps, including 11 K-12 public schools, nine public safety entities, six libraries, two community colleges and three other institutes of higher learning, five healthcare facilities, and one government building.
- Facilitate more affordable and accessible broadband service for up to 52,800 households and 3,700 businesses by enabling local Internet service providers to utilize the project's open network.
- Connect two major military installations in Alabama, one of which is now decommissioned and functioning as Small Business Administration-designated Historically Underutilized Business HUBZone.
- Interconnect in Anniston and Delta with the BTOP-funded Appalachian Valley Fiber Network project.

### ORGANIZATION'S HISTORY

JKM Consulting, a woman-owned business, has been managing the deployment of advanced broadband networks since 1998, performing network process and project management services to fiber service providers throughout the southern United States. JKM's technology division, M<sup>2</sup> Connections, seeks to promote the growth of businesses, educational institutions, and nonprofit organizations with a focus on enhancements through technology.

## ADMINISTRATIVE

### TECHNICAL PROPOSAL CONTACT

Any questions concerning technical specifications must be directed to:

<b>Name</b>	Joey Boyd
<b>Address</b>	<i>(USPS)</i> PO Box 3250 Oxford, AL 36203 <i>(UPS/FEDEX)</i> 1631 Hamric Drive East Oxford, AL 36203
<b>Phone</b>	256.405.0613
<b>FAX</b>	866.708.3062
<b>Email</b>	jboyd@projectbear.net

### DUE DATES

All quotes are due on 12 – 21 – 2011. Any proposal received after the required date specified for receipt shall be considered late and non-responsive. Any late quotes will not be evaluated for award.

### SCHEDULE

Event	Date
1. RFQ Distribution to Vendors	11 – 30 – 2011
2. Quote Due Date	12 – 21 – 2011
3. Vendor Selection	01 – 06 – 2012

## **GUIDELINES FOR QUOTE SUBMISSION**

### **QUOTE SUBMISSION**

Award resulting from this RFQ will be based upon the most responsive Vendor whose offer will be the most beneficial to *M<sup>2</sup> Connections* in terms of cost, functionality, and other factors as specified elsewhere in this RFQ.

*M<sup>2</sup> Connections* reserves the right to:

- Reject any or all offers and discontinue this RFQ process without obligation or liability to any potential Vendor
- Accept other than the lowest priced offer
- Award on the basis of initial offers received, without discussions or requests for best and final offers.

The Vendor must submit quote by 12 – 21 – 2011 to address referenced in Administrative section of RFQ.

### **TECHNICAL SPECIFICATIONS**

#### **1. Executive Summary**

JKM Consulting has been awarded a Broadband USA grant to provide broadband Internet services to “economically distressed east-central Alabama region that includes Calhoun, Talladega, Clay, and Randolph Counties, many valuable community organizations rely on slower, copper-based service for their Internet access, and some have no broadband service at all. JKM Consulting’s Project BEAR proposes to deploy a 176-mile fiber network that includes 88 miles of new fiber to provide high-speed, affordable broadband services and directly connect more than 40 community anchor institutions in the four-county region.”

Additionally “The project also plans to deploy six wireless access points to facilitate last-mile consumer service in isolated rural areas like Pleasant Valley in Calhoun County and all of Clay, Alabama, and the Talladega National Forest. The project intends to bring fiber to local Public Safety Access Points and other emergency agencies, and strengthen healthcare delivery by connecting rural hospitals such as Clay County and Wedowee Hospital to urban hospitals, enabling telemedicine services such as participation in the Alabama Pediatric Network. The project also expects to enhance local educational opportunities by connecting six community centers, increasing the quality of local after-school and homework programs”.

JKM Consulting has need expertise to develop a diverse and comprehensive wireless network design and deployment plan.

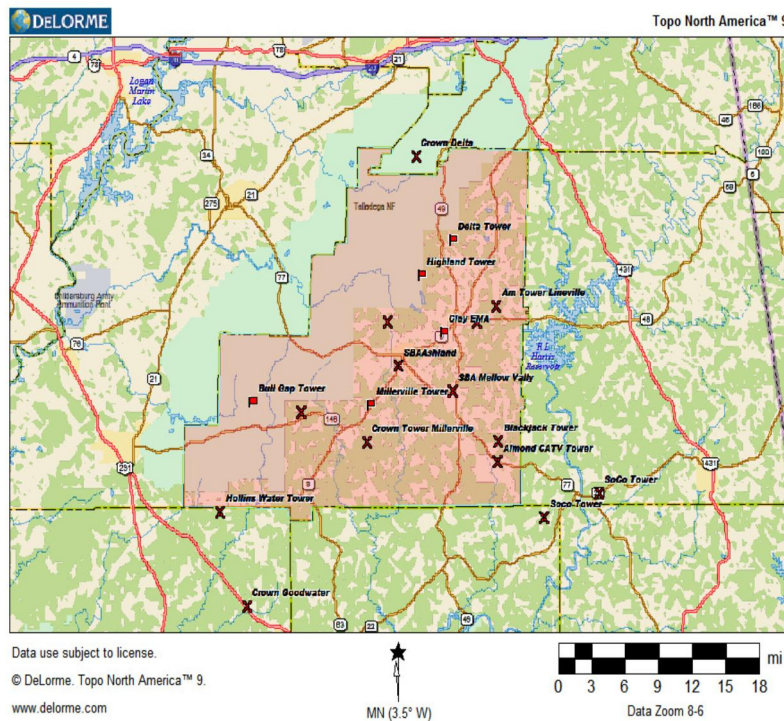
While the full extent of involvement for an RF Consultant’s services is open for discussion, at a minimum still being the required Scope of Services includes:

1. Initial field surveys and wireless system design(s)
2. System/solutions engineering
3. Development of technical specification for a bid document for Quotation for equipment and construction

## 2. Proposed Statement of Work for Initial Site Visits

The basic proposed statement of work for initial site visits will consist of visiting and surveying all identified tower transmission sites shown on the map below. There are approximately nineteen (19) sites identified and more may be added as work progresses. Also sites to be considered are any available water towers, fire or police towers, tall buildings and other suitable structures on which wireless equipment can be installed.

### Clay County Towers



During the initial site visits spectrum sweeps for license-exempt transmissions and area familiarization/orientation will also be conducted. It is essential a good understanding of the existing radio frequency (RF) environment is developed early in the planning process to determine which radio assets and types can be viably deployed to meet the project goals. The following license-exempt frequencies should be evaluated for possible use, 900 MHz, 2.4 GHz, 5.3 GHz 700 MHz (TV white space) and 5.8 GHz.

## 3. Target Coverage Areas

RF Target coverage areas have been defined Clay County Alabama and Pleasant Valley Community in Calhoun County Alabama. The coverage zones would be based on Census track information outlining population and demographic details.

#### **4. Key Issues and Design Considerations**

Key issues and design considerations will include an evaluation of the spectrum analysis test results, the identification and location of existing tower sites and other suitable structures as well as a general survey of the proposed installation environment to determine residential structure types, tree height and density along with a basic topographical layout of the region. This data will provide for development of a wireless network design and determination of which radio types and products to select for the proposed implementation. For consistency terminology between vendors a brief description of FCC terminology and classifications as standard reference is provided below and explains the differences in technologies and risks associated with license-exempt networks. All license-exempt MESH equipment included in this design is designed to operate in a multi-transmitter shared radio spectrum environment and will self-adjust to mitigate competing airwave usage.

#### **5. FCC Terminology and Description of Licensed and License-exempt Wireless Networks**

##### **5.1 License-exempt Wireless Networks**

*License-exempt radio spectra are frequency bands made available through the Federal Communications Commission (FCC) in a largely unregulated manner. Because these frequencies are not licensed, they are not proactively tracked or protected from any disruptive RF interference issues that may arise. The FCC does outline specific frequencies and power output levels for license-exempt systems but does not routinely check deployed sites for compliance. The FCC will also not become involved or assist any license-exempt operators if a frequency conflict arises whether the radio interference is intentional or not. This means that all license-exempt spectrum users are free to deploy radio systems at will without consultation or permission from any federal regulatory agencies and may create unannounced interference issues that degrade incumbent wireless network performance to unusable levels. All WIFI and most MESH networks employ license-exempt spectrum.*

##### **5.2 Licensed Wireless Networks**

*Licensed wireless networks are regulated and coordinated by the FCC. Operators of licensed networks must apply for and receive permission to install and operate equipment in defined frequencies and power output levels throughout the United States. These operators essentially own the spectrum and transmission paths they use as long as the license remains current and no FCC infractions and/or violations cause the license to be rescinded. Licensing spectrum guarantees the network owners and operators that RF interference is highly unlikely and there is no potential contention for wireless airwaves at any time during the service life of the network. FCC spectrum and wireless links are generally licensed for a period of ten (10) years. FCC licensed radio systems provide network owners with a high degree of investment protection unavailable with license-exempt radio equipment.*

#### **6. Preliminary Design Elements**

The Project BEAR proposed wireless network is very likely to contain a number of technologies, manufacturers, frequencies and deployment strategies. A comprehensive plan and review will have to be undertaken and will require field studies, equipment and technology research plus design work. While it is too early to determine all the factors that will be encountered a general list of technologies and a brief description of possible solutions follows.

### **6.1 Distribution to MESH Network - Existing and Proposed Fiber Network**

*Primary backhaul and distribution to connect master wireless routers can be achieved using the existing and proposed fiber networks.*

### **6.2 MESH Networks**

*MESH Networks are last mile systems that provide direct, or CPE-assisted connectivity from backhaul distribution feeds to end user devices such as laptop computers, IPads and other devices capable of utilizing a standards-based 802.x wireless signal. MESH networks typically require a number of distribution points in a relatively small area to overcome signal loss/fade over the air and through buildings and trees. MESH networks are capable of supporting about 3.0 Mbps of usable signal in a typical environment. MESH networks operate in license-exempt frequencies ranges and although are subject to interference from competing radiators, the technology has advanced and now employs frequency "hopping" features which mitigates the effects of other same-frequency transmissions.*

### **6.3 Point-to-multipoint Wireless Systems**

*Areas outside the existing fiber footprint can be connected to wireless backhaul networks consisting of a license-exempt 5.8/5.3 GHz systems. Proposed locations are likely to be one, many or all of the towers shown the map below although other sites may be indentified and utilized in the final proposed design as field work and meetings reveal other assets.*

*There are many types of point-to-multipoint wireless systems which include 700 MHz, 900 MHz, 2.4 GHz and others. Lower frequency systems are typically deployed to overcome line-of-sight issues and signal absorption due to trees and/or buildings in the desired coverage area. These systems, particularly 700 MHz and 900 MHz, require a full understanding of the prevailing RF environment, signal loss and absorption factors as well as software-generated models of the system prior to engineering design and deployment.*

### **6.4 Point-to-point Wireless Links**

*Point to point wireless connection may also have to be installed and connected to the fiber network and Internet feed. It is recommended that the point-to-point connection provide a minimum of 100 Mbps Through-put rate. Overhead capacity for traffic growth may also be incorporated into the overall design. Additional use for wireless PTP networks for internal traffic such as building-to-building connectivity or to aggregate other connections for remote access devices such as video cameras, data routers and/or SCADA systems*

## **DETAILED RESPONSE DETAILS**

### **SUMMARY**

Present a high-level synopsis of the Vendor's responses to the RFQ. The Summary should be an overview of product(s) and pricing

### **DETAILED AND ITEMIZED PRICING**

Present a detailed and itemized pricing of equipment and/or material listed in the Technical Specifications section of RFQ.

### **COMPANY OVERVIEW**

Provide the following for your company:

- Official registered name (Corporate, D.B.A., Partnership, etc.), address, main telephone number, toll-free numbers, and fax numbers.
- Key contact name, title, address (if different from above address), direct telephone and fax numbers.
- Person authorized to contractually bind the organization for any proposal against this RFQ.
- Brief history, including year established and past performance history in relation to ordering, delivery, problem solving and meeting proposal needs.

## EVALUATION FACTORS

### CRITERIA

Any award to be made in accordance to this RFQ will be based upon the proposal with appropriate consideration given to technical, cost and management requirements. Evaluation of offers will be based upon the Vendor's responsiveness to the RFP and the total price quoted for all items covered by the RFQ.

The following elements will be the primary considerations in evaluating all submitted proposals and in the selection of a Vendor or Vendors:

- Buy American – Section 1605 of the American Recovery and Reinvestment Act that specifies no funds appropriated by the Act may be used for public buildings/works project unless "all iron, steel and manufactured goods uses are produced in the U.S". Exceptions are allowed for cases where the head of the Federal agency concerned determines adherence would be "inconsistent with the public interest", where iron/steel/manufactured goods are not produced in the U.S. in sufficient and available quantities, or inclusion of U.S. products would increase overall project cost by 25 percent.
- Product(s) – Must meet specified technical specification requirements
- Cost – Lowest cost and competitive analysis
- Availability – Product(s) must meet anticipated delivery date
- Performance – Past performance history in relation to equipment and/or material ordering, delivery, problem solving and meeting schedule demands.

*M<sup>2</sup> Connections* may, at their discretion and without explanation to the prospective Vendors, at any time choose to discontinue this RFP without obligation to such prospective Vendors.



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