



Orange County, North Carolina

*Countywide Radio Communications Interoperability
and Systems Engineering Services Proposal*

RFP #5217

TECHNICAL PROPOSAL

February 23, 2016

Prepared by:

Dave Kaun
Ron Bundy



Elert & Associates
(651) 430-2772

www.elert.com

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February 23, 2016

Mr. David Cannell, Purchasing Agent
Orange County
200 S. Cameron Street
Hillsborough, NC 27278

Dear Mr. Cannell:

Elert & Associates Networking Division, Inc. (Elert & Associates (E&A)) is pleased to provide this proposal in response to Orange County's Request for Proposal to provide Countywide Radio Communications Interoperability and Systems Engineering Services (RFP #5217). We acknowledge Addendum 1 dated 02/08/16, Addendum #2 dated 02/12/16, and Addendum #3 dated 02/23/16.

E&A understands that Orange County is seeking a consultant to provide professional consulting, planning, and facilitation services relative to its short- and long-term radio communications and interoperability needs. The result of the study will determine the most economical, efficient, reliable, and state-of-the-art method for designing and provisioning a new countywide radio communications system used by local government entities.

Elert & Associates is an independent public safety and technology consulting firm. We specialize in public sector operations (focus on public safety and IT services), public safety communications studies and radio system interoperability issues, technology, CAD/RMS, E911, consolidated or regional PSAPs and Emergency Operations Centers (EOCs), and affiliated facilities and technology infrastructure design.

E&A's authorized representative is:

Dave Kaun, CTO
408 Lee Lambert Road, Maryville, TN 37803
Phone: (651) 705-1232; Email: dave.kaun@elert.com

We have included one original, five copies, and one flash drive copy for your review and consideration.

Please feel free to contact me if you have any questions regarding this proposal or if I can be of assistance in any other way at (651) 705-1232 or dave.kaun@elert.com.

Sincerely,

A handwritten signature in black ink that reads "Dave Kaun".

Dave Kaun
Elert & Associates

minnesota

illinois

south carolina

florida

tennessee

connecticut

SECTION 1: Introduction

Project Understanding

Orange County, NC has issued a Request for Proposal (RFP #5217) to provide Countywide Radio Communications Interoperability and Systems Engineering Services. Elert & Associates understands this RFP is for an independent consulting firm to conduct a study that will determine the County's most economical, efficient, reliant, and state-of-the-art method of designing and acquiring a new countywide radio communications system.

This study will include strategic and tactical plan that will review and analyze the existing and future communications requirements for all law enforcement, fire, EMS, public works, schools, planning/inspections, transit, and other county and local government entities. The study/assessment will address communication system issues such as RF coverage, capabilities and features, and migration options for the county's existing and/or envisioned systems to integrate with future technologies.

Based on recommendations determined in the study, the ultimate goal will be the development of a vendor-neutral Request for Proposal suitable to be released (to be approved by committee prior to release) to vendors for purposes of procuring a new countywide radio communications system. This system will be used by local government entities to meet the long term voice communications, paging, and voice interoperability needs of the emergency and non-emergency agencies.

Overall approach, tasks, and project timeline will be further detailed in Section 3: Response to Technical Requirements.

Specific Approach to this Project and Other like Projects

It is helpful at this point to explain the management approach that Elert & Associates follows when supporting a client who is undertaking a major technology project. E&A's consultants have supported dozens of individual and consortium clients with a variety of complex public safety technology projects. As an indication of our knowledge and understanding of these activities, we want to share with you the criteria with which we measure a project's success.

A successful project is a project that...

- Is completed on schedule and within budget.
- Engages the key project participants in the project, thus building project ownership that results in successful completion and long term cooperation.
- Avoids common pitfalls through careful planning and implementation.
- Creates a competitive and fair bidding environment, thus maximizing the probability of receiving the best proposals and pricing while also avoiding any procurement process appeals or delays.
- Is open to unique and creative solutions allowing technical and vendor staff to best meet client needs.

- When completed, meets the client's goals and objectives.
- Manages the unique dynamics of a cross-functional consortium (Law Enforcement, Fire, EMS), addressing the needs and concerns of all stakeholders, reaching out to inform and to gather input from participants to ensure that they are heard and understood.
- Communicates project progress to keep participants informed and engaged.
- Ensures that all service and equipment providers have met their contractual obligations.
- Includes adequate training and operational planning activities to maximize the use and benefits of the new and enhanced technologies to the participating agencies.

These success factors will be logically be applied and considered during each of the key project stages: Data Collection, Needs Analysis, System Design Options, Design Selection, RFP Preparation, RFP Response Evaluation, and Vendor(s) Selection/Project Management.

Both technical and operational expertise is necessary to adequately accomplish each phase of the project. One without the other can result in gaps of understanding and missed opportunities. Our blend of technical and public safety practitioner experience within our consultant team ensures that we will look at the project strategically with a full understanding of the desired goals and objectives. The practical, real world experience offered by consultants who have also served as administrators in public safety agencies and who have assisted and supported dozens of other public safety clients is very important to project success.

Methodologies that E&A Will Employ for This Project

Elert & Associates follows typical industry project management protocols, based on project management methodologies as promulgated by the Project Management Institute (PMI). Key components of our methodologies include but are not limited to the following:

- Project team roles – Defining the project manager/project sponsor/functional manager/team member roles and responsibilities and understanding the impact of different organizational structures.
- Project document relationships – Relating the needs analysis, RFP, statement of work (SOW), work breakdown structure (WBS), and specifications to each other.
- Adequate scheduling processes – Identifying activities, establishing logical relationships, estimating durations, and determining critical path activities.
- Budget and estimating – Applying sound estimating methodologies and budgeting practices.
- Focus on quality – Distinguishing and apply quality planning, assurance, and control methods.
- Risk management – Identifying potential risk factors and developing response strategies and risk control techniques.

- Communications – Adequately gathering and disseminating project information to and among stakeholders makes for success. This includes face-to-face meetings, agendas prepared and minutes of meetings for review and tracking.
- Procurement – Supporting the procurement process; understanding and managing its impact on completing projects successfully.
- Team structures/practices – Fostering effective communications and feedback among team members, customers, suppliers, and managers.
- Scope control – Understanding the need to establish variance and change thresholds for scope, time, and cost control (controlling scope creep).

Rationale for Methodology

The methodology utilized by Elert & Associates has been honed by numerous successful projects. While we are always on the side of our client, we have found it best to share knowledge with the selected vendor during the detailed design process to insure the vendor (now system contractor) is fully made aware of all information collected by the consultant. However, E&A never loses sight of the fact we represent the owner and to that end, the client will not be short changed.

As consultant for this project, Elert & Associates will collect needed information about the needs of Orange County while also providing technical information to County staff such that a knowledge transfer occurs as to the methodology used for the final recommended design.

The plan followed by Elert & Associates is to provide information to the various proposers about the present system at Orange County, a conceptual solution believed to meet requirements of the County and then requires the selected vendor to develop a detailed plan, schedule, and a not to exceed cost. This response with all its required detail will then be used to evaluate and select the best proposal.

Once selection of the best received proposal occurs and an award is made, then a team consisting of the owner, the consultant, and the selected vendor/contractor will be built to allow the best possible system to be developed. However, it is and continues to be the responsibility of Elert & Associates to insure the selected vendor provides the best possible product for the County.

SECTION 2: Response to General Requirements

Organizational Qualifications

Company Name: Elert & Associates Networking Division, Inc.

Address: (Headquarters) 140 Third St. S., Stillwater, MN 55082
(TN Office) 408 Lee Lambert Road, Maryville, TN 37803

Primary Contact: Dave Kaun, CTO, (651) 705-1232; Email: dave.kaun@elert.com

About Elert & Associates

Elert & Associates (E&A) was established as a privately owned firm established in March of 1984. Over the past 32 years, we have served hundreds of government clients throughout the United States. Our 25+ consultants and other staff work out of our headquarters in Stillwater, Minnesota and our multiple branch offices.



E&A is an independent technology and public safety consulting firm. We specialize in technology, public sector operations (focus on public safety and IT services), public safety communications and interoperability issues, CAD/RMS, E911, consolidated or regional PSAPs and Emergency Operations Centers (EOCs), and affiliated facilities and technology infrastructure design.

E&A provides expertise and support to government sector clients in the areas of technology planning, staffing assessments, outsourcing, and consolidation studies. Our professional design services encompass several areas, including public safety communication and technology systems, building technology design requirements, equipment procurement specifications, system implementation, and acceptance testing. In addition to public safety, we also offer expertise in the areas of telephone systems, low voltage cabling, computer network design, in-building wireless, microwave design, broadband wireless, CCTV/security, access control, and video teleconferencing.

Public safety has been a focus of our organization from the beginning and has continued to grow. In the areas of strategic planning for operational and staffing issues, we are fortunate to have several former public safety practitioners on staff as senior consultants. These individuals have had extensive exposure to and experience in all areas of public safety operations, agency administration, services planning, staffing, and budgeting and technology needs.

The most recent three P25 trunked radio systems in Iowa are now becoming a regional interconnect solution for the eastern side of the State. The present region consists of two complete P25 trunked systems already interconnected and serving nearly 4,000 radios in two adjacent counties with populations of 211,000 and 135,000. The area served consists of Johnson County (Iowa City and University of Iowa) and Linn County (Cedar Rapids) with a geographic area of nearly 1350 square miles of hilly terrain. There are a total of 15 repeater sites, five dispatch centers, and two EOCs with this Harris P25 800 MHz system utilizing two simulcast cores and VHF interoperability channels. Being added now to the two county system is a third area, Black Hawk County to the north which will consist of six 10 channel P25 sites and a dispatch center. Mutual aid agreements are in place for what will be six dispatch centers to back each other up in the event of a catastrophic event and the three systems allow for complete roaming of all radio users. In addition, as the State of Iowa builds out its P25 Phase II 700 MHz Motorola network, it is expected this regional solution will have an ISSI interface allowing statewide roaming.

The success of and references for our projects speak for themselves. E&A has developed designs after having conducted detailed assessments resulting in systems that meet the objectives of our clients. Systems range from as few as 2-3 sites using conventional analog radio all the way to extremely complex multisite trunking using P25. Some designs have included just the radio system and solutions while others include building design with full backup power and fiber interconnect.

Areas of Public Safety Expertise

E&A's public safety areas of expertise include:

- VHF/UHF/700 & 800 MHz Radio
- APCO P25 Conventional Systems
- Shared Radio Systems
- P25 Digital Trunked Radio Systems
- Mobile Data (Broadband Wireless) Systems
- Paging & Siren Control Systems
- Land Based & Wireless Automated Fire Station Alerting and Control Systems
- Network Communications
- Digital Microwave Systems
- MPLS Networks
- Redundant Strategies & Backup Systems
- SAFECOM and NFPA Standards
- Dispatch Center & EOC
- PSAP's and Radio Systems
- CAD/RMS Systems
- Project Management

Certifications & Professional Affiliations

- ◆ AICP American Institute of Certified Planners
- ◆ APCO Association of Public-Safety Communications Officials
- ◆ ASIS American Society for Industrial Security
- ◆ BICSI Building Industry Construction Services International
- ◆ CBCP Certified Business Continuity Planner
- ◆ CCNA Cisco Certified Network Associate, Routing and Switching Certification
- ◆ CDT Construction Documents Technologist
- ◆ CHS-III Certified Homeland Security Professional
- ◆ CPP Certified Protection Professional, American Society for Industrial Security
- ◆ CPTED Crime Prevention Through Environmental Design Certification

- ◆ CTS Certified Technology Specialist
- ◆ CTS-D Certified Technology Specialist – Design
- ◆ EE Electrical Engineer
- ◆ FCC General Class Radiotelephone License
- ◆ ICIA International Communications Industries Association, Inc.
- ◆ IEEE Institute of Electrical & Electronic Engineers
- ◆ LEED AP Leadership in Energy and Environmental Design, Accredited Professional
- ◆ 911 ENP Emergency Number Professional
- ◆ PMP Project Management Professional
- ◆ PSP Physical Security Professional
- ◆ RCDD Registered Communications Distribution Designer
- ◆ STC Society of Telecommunications Consultants Membership

Staff Qualifications and Facilities

Both technical and operational expertise are necessary to adequately accomplish each phase of the project. One without the other can result in gaps of understanding and missed opportunities. Our blend of technical and public safety practitioner experience within our consultant team ensures that we will look at the project strategically with a full understanding of the desired goals and objectives.

The practical, real world experience offered by consultants who have also served as administrators in public safety agencies and who have assisted and supported dozens of other public safety agencies and consortiums is very important to project success.

E&A brings along all of the necessary technology consultants to support the design and implementation of fiber optics, local area networking, microwave, voice systems, servers, and necessary support systems. We are confident that your review of our technical approach (project plan) will result in your confidence that our approach is comprehensive and logically related to the manner in which an initiative such as this should flow.

Our experience with other similar projects across the country demonstrates we have a proven track record of supporting our clients in a manner which accomplishes their goals and objectives. Our experience provides us with the necessary knowledge and understanding of current systems and technological trends which will allow us to provide the best advice and recommendations for you.

Key Personnel



Dave Kaun – Project Manager

Dave is Elert & Associates’ Chief Technology Officer with 40+ years of experience in communications technology systems. He joined E&A in 1996, after an accomplished career with the University of Wisconsin. His background includes public safety communications, broadcasting, wireless, telecommunications, network design, distance learning, and video conferencing.

Dave’s formal education includes two A.S. degrees in electronics, a B.S. degree in electronics, and an M.S. degree in technology management. He has presented at local and national conferences. Dave maintains his knowledge of the latest technologies including wireless, multimedia, fiber optics, networking, VoIP, cellular/radio communications, business continuity, public safety and project management. Dave holds licenses from the Federal Communications Commission (FCC) and is a senior member of the IEEE.

Dave’s recent and current projects are focused on Public Safety and interoperable communications systems. Typical issues involve radio and mobile data communications, interoperability among multiple agencies and facility designs. Recent designs include dispatch centers and emergency operation centers where his multimedia and wireless communication systems experience are combined to create effective solutions.

John Thompson – Public Safety Consultant

John Thompson is a senior public safety consultant with significant experience in public safety radio system design and implementation. He has worked previously as a systems design engineer and engineering manager with a major public safety radio system provider (EF Johnson). As a consulting engineer, John has supported numerous projects and dozens of counties and cities as they worked to develop short- and long-range plans for enhancing public safety radio communications and regional interoperability.

Pete Gray – Network/Wireless Consultant

Pete Gray is a senior network consultant with considerable experience in IP networks, wireless and systems design through implementation. His most recent experience has been to develop a nearly 90 node wireless system for a city that integrated their fiber optics plant and is used in support of their traffic signals, water distribution SCADA system and City administrative network. His experience in both internal and external WiFi networks bring a wealth of knowledge.

Please see personnel resumes on the following pages.



Resume: Dave Kaun Chief Technology Officer

areas of expertise

Extensive consulting experience working with clients in the planning, design and implementation management of networks in the areas of public safety radio, microwave, video and data, wireless broadband, and fiber optics.

Subject matter expert in network integration, classroom/EOC/conference room design, strategic/long range planning and project management.

significant recent projects

Sheboygan County, WI 800 MHz P25 Trunked Radio
Description: 7 Site Simulcast LMR
Completed: Scheduled for late 2016

La Crosse, WI 800 MHz P25 Trunked Radio System
Description: 3 Site Simulcast LMR
Completed: Scheduled for November 2015

Linn County and Cedar Rapids, IA
800MHz P25 Trunked Radio System
Description: 6 Site Simulcast with 3 Dispatch Centers
Completed: 2013

Germantown, TN 800MHz P25 LMR
Description: 2 Site Simulcast Conventional
Completed: 2013

Johnson County, IA Joint Emergency Communications Center and 800MHz Trunked Radio System
Description: EOC and 7 Site Simulcast
Completed: 2011

Black Hawk County, IA
Description: Public Safety Radio Assessment
Completed: 2012

Hennepin County Public Safety
Description: Satellite Interconnect System for P25
Completed: 2010

Bridgeport, CT
Description: Public Safety Radio System and EOC
Completed: 2010

Marathon County
Description: Public Safety Radio System
Completed: 2010

minnesota

illinois

south carolina

florida

tennessee

connecticut

experience

1995 – Present Elert & Associates
• Chief Technology Officer

1988 – 1995 University of Wisconsin – Stout (Menomonie, WI)
• Director, Telecommunications and Networking

1975 – 1988 University of Wisconsin – Stout
• Teleproduction Center

1973 – 1974 WMVS/WMTV-TV, Channel 10/36 (Milwaukee, WI)
• Television Technician

1969 – 1973 US Navy – Electronics/Radar Systems

education

University of Wisconsin – Stout (Menomonie, WI)
• Master of Science, Management Technology
• Bachelor of Science, Industrial Technology – Electronics, Magna Cum Laude

Milwaukee Area Technical College (Milwaukee, WI)
• Associate of Science, Electrical Technology – Communications

Madison Area Technical College (Madison, WI)
• Associate of Science, Electronics Technology

training and certifications

- EADS Radio Communications Training (2008)
- Motorola Radio Communications Systems Training (2007 - 2013)
- Harris RAPTR & Digital Radio/Network Training (2006 - 2008)
- Harris Microwave Systems Training (2006)
- Fundamentals of Cellular & PCS Communications (2001)

memberships

- Institute of Electrical and Electronic Engineers (Senior Member)
- FCC Radiotelephone License
- APCO



Resume: John Thompson Public Safety System Consultant

areas of expertise

Public safety communication systems, RF engineering, RF trunking systems, RF telemetry systems and project management

significant projects

Sheboygan County, WI 800 MHz P25 Trunked Radio
Description: 7 Site Simulcast LMR
Completed: Scheduled for late 2016

La Crosse, WI 800 MHz P25 Trunked Radio System
Description: 3 Site Simulcast LMR
Completed: Scheduled for November 2015

Linn County and Cedar Rapids, IA
800MHz P25 Trunked Radio System
Description: 6 Site Simulcast with 3 Dispatch Centers
Completed: 2013

Columbia County, WI
Description: Develop Design and RFP for replacement radio system for the county
Completed: 2009

Huron County, OH
Description: Assess present public safety system and recommend upgrade path to narrowband for radio system users.
Completed: 2009

Sheboygan County, WI
Description: Oversee Nextel Rebanding Project for County
Completed: 2009

Trempealeau County, WI
Description: Radio Systems Upgrade Project
Completed: 2009

Johnson County, IA
Description: Replacement seven-site Trunked Simulcast Radio System and new Dispatch Center
Completed: 2009

experience

2005 – Present *Elert & Associates
Public Safety Systems Consultant*

2002 – 2004 *NextNet Wireless Inc.
(Bloomington, MN)
Director, International Sales*

1997 – 2002 *Dataradio COR Ltd.
(Burnsville/Waseca, MN)
Manager, Marketing (2001-2002)
Senior Product Manager (1997-2001)*

1996 – 1997 *Sprint PCS (Eagan, MN)
Senior RF Engineer*

1995 – 1996 *Self-Employed Telecom Consultant*

education

University of St. Thomas (St. Paul, MN)
Marketing Management Degree Program

Capitol Radio Engineering Institute (Washington, D.C.)
General Electronics Engineering Course

Austin Community/Technical College (Austin, MN)
Liberal Arts and Electronics Courses

training and certifications

- Cisco Certified Network Associate (CCNA) program at Cisco Network Academy, Inver Hills Community College
- FCC General Radiotelephone License
- APCO

minnesota

illinois

south carolina

florida

tennessee

connecticut



Resume: Pete Gray Technology Consultant

areas of expertise

Project Management, LAN/WAN/MAN design, Wireless LAN design, cabling infrastructure design, AV/multimedia systems

significant projects

Minot, ND
Description: Wireless Metropolitan Area Network Design/Wireless Data System for SCADA/Project Management

Hopkins, MN Public Schools
Description: Infrastructure Cabling/Data Network/Wireless LAN/Phone System/Project Management

New Ulm, MN Public Schools
Description: Technology Assessment/LAN/Wireless LAN/Project Management

Bloomington, MN Schools
Description: Cabling Design/Fiber MAN Design/LAN/ Project Management

Pine County, MN Courthouse
Description: Infrastructure cabling/Data Network, AV Multimedia systems design, Project Management

Independent School District 196 (MN)
Description: LAN/MAN Design/Project Management

Cumberland County Library System (Carlisle, PA)
Description: Wide Area Network Design

Ohio Wesleyan University (Delaware, OH)
Description: Campus Wireless LAN Design/Project Management

experience

- 1992 – Present *Elert & Associates*
- Technology Consultant (2003-present)
 - Network Consultant (1994-2003)
 - Staff Analyst – Cartography Division (1992-1994)

education

- University of Wisconsin – Eau Claire (Eau Claire, WI)*
- Bachelor of Science, Geography and Math

training and certifications

- International Communications Industries Association, Inc. (ICIA) Certified Technology Specialist Training
- Certified Wireless Network Professional (CWNP™) Certified Wireless Network Administrator + Wireless Security Training (WaveGard, Inc.)
- Principles of Applied A/V Design (International Communications Industries Association – ICIA)
- Developing & Preparing Emergency Response Plans (National Emergency Response & Rescue Training – NERRT)
- Essentials of the A/V Industry (International Communications Industries Association – ICIA)
- School of Audio Visual Technologies (Extron Electronics)
- ICIA Design School Online (International Communications Industries Association – ICIA)
- Cisco Certified Network Associate (CCNA) Training

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Statement of Objectivity

Elert & Associates hereby declares:

1. We are an independent public safety and technology consulting firm.
2. We sell no hardware or software or any tangible products, including but not limited to networking devices, wireless equipment, security systems, telecommunications equipment, cabling, multimedia displays or projection systems/devices.
3. We are not aligned with any manufacturers of the above-listed products or any products.
4. We are not aligned with any vendors, or distributors, or representative firms who sell, market, install, program or subcontract work for the above-listed products, or any products or services.
5. We are paid only on a fee (hourly) basis by our clients for whom we are contractually committed to providing independent consulting and design engineering services.
6. We receive no commissions, salaries, or payoffs of any kind from any business entity for services we perform on behalf of our clients, or for products that we may from time to time recommend to our clients on their behalf.



Signed _____
Gary Elert, President

Reference Projects

Complete assessments were completed for all of the following projects prior to moving forward to RFP, award, and commissioning:

| Project/Location | Description | System/Subscriber Cost | Dates | Consultants |
|---|--|--|--------------|---|
| Lincoln, NE P25 800 MHz trunking system serving all city and county public safety users | 800 MHz, 3 site, 11 channel, P25 trunk system supporting over 1500 radios, dispatch center and an EOC. Replacing EDACS. | ~\$10.5M-\$12M project with award pending via a full RFP process and final award. | 2014-Present | Dave Kaun PM John Thompson |
| Sheboygan County, WI P25 800 MHz trunked radio system serving all county public safety users. | 800 MHz, 6 site, 8 channel, P25 trunk system supporting over 1000 radios, dispatch center, backup PSAP and an EOC. Replacing a Smartnet system. | ~\$11M project award to Motorola via a full RFP process. Presently in the build state though one site is still being negotiated and new tower awarded. | 2014-Present | Dave Kaun PM John Thompson |
| Black Hawk County, IA P25 800 MHz trunking system serving all county public safety users and connect to Linn Co. regional system. | 800 MHz, 5 site, 7 channel, P25 trunk system supporting over 1000 radios, dispatch center and an EOC. Replacing EDACS leased system. | ~\$9.5M project awarded to RACOM via a full RFP process. Project in leasing towers and construction phase. 2017 expected completion | 2014-Present | Dave Kaun PM John Thompson |
| La Crosse, WI P25 800 MHz Trunked Public Safety Radio System serving all public safety users | 800 MHz, 3 site, 5 channel, P25 trunk system supporting over 900 radios and dispatch center. A Motorola SmartNet system was replaced. | This \$7M Project was awarded to Motorola via full RFP process and is in final construction phase. Cutover January 2016. | 2014-2015 | John Thompson PM Dave Kaun Pete Gray |
| Johnson County, IA City, Iowa State University, IA P25 800 MHz trunking system serving most public safety users | 800 MHz, 7 site, 10 channel, P25 trunk system supporting over 1800 radios, 2 dispatch centers, and an EOC. Also a complete dispatch center and EOC. | Final trunked system infrastructure cost was \$8.9M though building technology and subscriber radios acquired separately. | 2008-2011 | Dave Kaun PM John Thompson Charles Allison Mike Milas (1st PM) |
| Germantown, TN P25 Public Safety Radio System Upgrade serving all City users | 800 MHz 2 site 5 channel simulcast P25 radio system supporting about 300 radios and one dispatch center. | System was estimated with 3 sites at \$2.6M but decision was made to get by with 2 sites at \$1.9M. Motorola. | 2011-2013 | Dave Kaun PM Charles Allison |
| Douglas County, MN P25 800 MHz system countywide and upgrade to dispatch center/LEC building | 800 MHz 4 site trunked simulcast P25 radio system supports about 350 radios and one dispatch center. It was an extension of the Minnesota ARMER (Motorola ASTRO25 system). | Making use of state tower sites and only requiring radio and microwave, this system cost was \$312,000 plus one tower \$235,000. | 2010-2012 | John Thompson PM Dave Kaun Roger Olwin |

La Crosse, Wisconsin

Organization Type: City

Contact: Ms. Jacky Greschner
Director of Information Services
City of La Crosse
400 La Crosse Street
La Crosse, WI 54601
Phone: 608-789-8225
Email: greschnerj@cityoflacrosse.org

Project Name: 800 MHz Radio System Upgrade Assessment and Strategic Plan

Project Details: Elert & Associates was selected by the City of La Crosse to conduct a complete assessment of their existing 800 MHz SmartNet trunked radio system which no longer meets the needs of the city public safety, transportation and public service needs relative to primarily coverage and in-building needs. The existing system was modeled and this model closely matched what we were told was the experienced coverage. During the assessment, E&A determined four base station sites would be needed to provide the level of desired coverage in a simulcast configuration. Other options reviewed included potential attachment to the State of Minnesota ASTRO 25 system and the State of Wisconsin WISCOM ATLAS system. After the recommendation was discussed during a draft review of the assessment report, a detailed estimated project cost for budget purposes was developed and included in the final report. The City approved moving forward utilizing a RFP to which three companies responded. The award was made to Motorola with the system now complete and cutover.

Johnson County, Iowa

Organization Type: County Consolidated Dispatch Center and EOC

Contact: Mr. Tom Jones, Executive Director
Joint Emergency Communication Center
4529 Melrose Avenue West
Iowa City, IA 52246
Phone: 319-356-6888
E-mail: tjones@co.johnson.ia.us

Project Name: Joint Emergency Communication Association

Project Details: Elert & Associates was selected by Johnson County, IA (named the Joint Emergency Communications Center) to provide consulting services to assist the Policy Board to develop a design for a replacement County-wide 800 MHz trunked radio system and the design of the technology for a new consolidated dispatch center and emergency operations center. The project began in 2008 with a study and resulted in the development of seven trunked radio sites and the finalization of the new dispatch center and emergency operations center building. The \$8.9M P25 radio system was awarded to Harris (Tyco). The system was completed in 2012 and is fully operational serving about 2600 radios.

Linn County, Iowa

Organization Type: County and Three Cities in Iowa

Contacts:

| | |
|--|--|
| Mr. Charlie McClintock | Captain Dave Knott |
| City of Cedar Rapids | Linn County |
| Director, 911 PSAP Center | Director, 911 PSAP Center |
| Joint Communications Agency | Sheriff's Department |
| 505 1 st Street SW | 310 2 nd Ave. SW |
| Cedar Rapids, IA 52404 | Cedar Rapids, IA 52406 |
| Phone: 319-286-5383 | Phone: 319-892-6116 |
| E-mail: c.mcclintock@cedar-rapids.org | E-mail: david.knott@linncounty.org |

Project Name: Replacement Public Safety Radio System

Project Details: Linn County, the City of Cedar Rapids, the City of Hiawatha, and the City of Marion all suffered through flooding and the fact they operate on different frequency bands and systems, thus interoperability was at a forefront for public safety. The various agencies in this area decided it was time that all move to a common system. E&A was retained to develop a request for proposal and assist these agencies in acquiring a new P25 800 MHz trunked radio system. The system was bid using an RFP developed by E&A, awarded to Harris. System cost was about \$20+M serves about 2900 radios. The cutover occurred February 2014. E&A served as the conduit between the owner and Harris throughout the project with the final closeout meeting April 2014.

Trempealeau County, Wisconsin

Organization Type: County in Wisconsin

Contact:

Mr. Dan Schreiner, Emergency Management
36245 Main Street
Whitehall, WI 54773
Phone: 715-538-4351
E-mail: schreinerd@tremplecounty.com

Project Name: Replacement Public Safety Radio System

Project Details: Elert & Associates was retained to conduct a review of Trempealeau County's public safety radio system in 2008 and to offer a complete system recommendation thus completing Phases I, II, and III of their project. In the study/assessment, the problems were addressed and options offered to improve the system. After the County reviewed the options and selected the one they felt best met their needs, the County obtained Board authorization to acquire the recommended system in 2010. E&A developed a Request for Proposal for the design, and the \$2.5M project was awarded to a local Motorola shop for implementation. E&A provided system implementation oversight through commissioning with operation and cutover June 2012. Today, the County has stopped hearing complaints from officers.

Complete Government Client List

| | | |
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| AITKIN COUNTY, Aitkin, Minnesota | CAMPBELL COUNTY, Rustburg, Virginia | CITY OF BLOOMINGTON, Bloomington, Minnesota |
| ALLAMAKEE COUNTY, Waukon, Iowa | CARROLL COUNTY, Carroll, Iowa | CITY OF BRIDGEPORT, Bridgeport, Connecticut |
| ASHLAND COUNTY, Ashland, Wisconsin | CARVER COUNTY, Chaska, Minnesota | CITY OF BURNSVILLE, Burnsville, Minnesota |
| AUDUBON COUNTY, Audubon, Iowa | CASS COUNTY, Fargo, North Dakota | CITY OF CASPER, Casper, Wyoming |
| AUSTIN PUBLIC UTILITIES, Austin, Minnesota | CASS COUNTY, Virginia, Illinois | CITY OF CEDARBURG, Cedarburg, Wisconsin |
| BARRON COUNTY, Barron, Wisconsin | CEDAR COUNTY, Tipton, Iowa | CITY OF CEDAR RAPIDS, Cedar Rapids, Iowa |
| BAYFIELD COUNTY, Washburn, Wisconsin | CHEROKEE COUNTY, Cherokee, Iowa | CITY OF CHAMPAIGN, Champaign, Illinois |
| BEADLE COUNTY, Huron, South Dakota | CHIPPEWA COUNTY, Chippewa Falls, Wisconsin | CITY OF CHARLOTTE, Charlotte, North Carolina |
| BELTRAMI COUNTY, Bemidji, Minnesota | CHISAGO COUNTY, Center City, Minnesota | CITY OF COLLEGE STATION, College Station, Texas |
| BENTON COUNTY, Vinton, Iowa | CITY AND COUNTY OF LEAVENWORTH, Leavenworth, Kansas | CITY OF COLUMBIA HEIGHTS, Columbia Heights, Minnesota |
| BLACKHAWK COUNTY, Waterloo, Iowa | CITY OF ALBERTVILLE, Albertville, Minnesota | CITY OF COLUMBUS, Columbus, Wisconsin |
| BLUE EARTH COUNTY, Mankato, Minnesota | CITY OF ALLEN, Allen, Texas | CITY OF COTTAGE GROVE, Cottage Grove, Minnesota |
| BOONE COUNTY, Belvidere, Illinois | CITY OF ALTOONA, Altoona, Pennsylvania | CITY OF DAYTON, Dayton, Ohio |
| BREMER COUNTY, Waverly, Iowa | CITY OF AMES, Ames, Iowa | CITY OF DECORAH, Decorah, Iowa |
| BREVARD COUNTY, Viera, Florida | CITY OF ANKENY, Ankeny, Iowa | CITY OF DES MOINES, Des Moines, Iowa |
| BROWN COUNTY, New Ulm, Minnesota | CITY OF ANOKA, Anoka, Minnesota | CITY OF DUBUQUE, Dubuque, Iowa |
| BUFFALO COUNTY, Alma, Wisconsin | CITY OF APPLE VALLEY, Apple Valley, Minnesota | CITY OF DULUTH, Duluth, Minnesota |
| BUREAU OF CRIMINAL APPREHENSION, St. Paul, Minnesota | CITY OF AUSTIN, Austin, Texas | CITY OF EAGAN, Eagan, Minnesota |
| BURNETT COUNTY, Siren, Wisconsin | CITY OF BATTLE CREEK, Battle Creek, Michigan | CITY OF EDEN PRAIRIE, Eden Prairie, Minnesota |
| BUTLER COUNTY, Allison, Iowa | CITY OF БЕЛОIT, Beloit, Wisconsin | CITY OF EDINA, Edina, Minnesota |
| CALHOUN COUNTY, Marshall, Michigan | CITY OF BISMARCK, Bismarck, North Dakota | CITY OF FARGO, Fargo, North Dakota |

CITY OF FARMINGTON,
Farmington, New Mexico

CITY OF FORT ATKINSON,
Fort Atkinson, Wisconsin

CITY OF FORT COLLINS,
Fort Collins, Colorado

CITY OF GAINESVILLE,
Gainesville, Georgia

CITY OF GARLAND,
Garland, Texas

CITY OF GERMANTOWN,
Germantown, Tennessee

CITY OF GOODYEAR,
Goodyear, Arizona

CITY OF GRAND FORKS,
Grand Forks, North Dakota

CITY OF GROSSE POINT FARMS,
Grosse Point Farms, Michigan

CITY OF HAM LAKE,
Ham Lake, Minnesota

CITY OF HASTINGS,
Hastings, Minnesota

CITY OF HERMANTOWN,
Hermantown, Minnesota

CITY OF HURST,
Hurst, Texas

CITY OF INVER GROVE HEIGHTS,
Inver Grove Heights, Minnesota

CITY OF IOWA CITY,
Iowa City, Iowa

CITY OF JANESVILLE,
Janesville, Wisconsin

CITY OF KANSAS CITY,
Kansas City, Missouri

CITY OF LINCOLN,
Lincoln, Nebraska

CITY OF MADISON,
Madison, Wisconsin

CITY OF MANKATO,
Mankato, Minnesota

CITY OF MAPLE GROVE,
Maple Grove, Minnesota

CITY OF MAPLEWOOD,
Maplewood, Minnesota

CITY OF MCHENRY,
McHenry, Illinois

CITY OF MINNETONKA,
Minnetonka, Minnesota

CITY OF MINOT,
Minot, North Dakota

CITY OF NEW HOPE,
New Hope, Minnesota

CITY OF NIXA,
Nixa, Missouri

CITY OF OAK GROVE,
Cedar, Minnesota

CITY OF OCONOMOWOC,
Oconomowoc, Wisconsin

CITY OF OLIVETTE,
Olivette, Missouri

CITY OF ORONO,
Orono, Minnesota

CITY OF OTTUMWA,
Ottumwa, Iowa

CITY OF OWATONNA,
Owatonna, Minnesota

CITY OF PINGREE GROVE,
Pingree Grove, Illinois

CITY OF PLYMOUTH,
Plymouth, Minnesota

CITY OF PORTLAND,
Portland, Oregon

CITY OF RALEIGH,
Raleigh, North Carolina

CITY OF RICHMOND HEIGHTS,
Richmond Heights, Missouri

CITY OF ROBBINSDALE,
Robbinsdale, Minnesota

CITY OF ROCKFORD,
Rockford, Illinois

CITY OF ROCKWALL,
Rockwall, Texas

CITY OF ROSEVILLE,
Roseville, Minnesota

CITY OF ROUND ROCK,
Round Rock, Texas

CITY OF ST. CLOUD,
St. Cloud, Minnesota

CITY OF ST. LOUIS PARK,
St. Louis Park, Minnesota

CITY OF ST. PAUL,
St. Paul, Minnesota

CITY OF SALINA,
Salina, Kansas

CITY OF SAVANNAH,
Savannah, Georgia

CITY OF SEGUIN,
Seguin, Texas

CITY OF SHOREVIEW,
Shoreview, Minnesota

CITY OF SOUTH ST. PAUL,
South St. Paul, Minnesota

CITY OF STATESBORO,
Statesboro, Georgia

CITY OF SUPERIOR,
Superior, Wisconsin

CITY OF TOPEKA,
Topeka, Kansas

CITY OF VADNAIS HEIGHTS,
Vadnais Heights, Minnesota

CITY OF WAHPETON,
Wahpeton, North Dakota

CITY OF WATERTOWN,
Watertown, Wisconsin

CITY OF WAUSAU,
Wausau, Wisconsin

CITY OF WEBSTER GROVES,
Webster Groves, Missouri

CITY OF WESTLAND,
Westland, Michigan

CITY OF WOODBURY,
Woodbury, Minnesota

CLARK COUNTY,
Neillsville, Wisconsin

CLAY COUNTY,
Spencer, Iowa

CLAY COUNTY,
Vermilion, South Dakota

CLAYTON COUNTY,
Elkader, Iowa

FAYETTE COUNTY,
Fayette, Iowa

CODDINGTON COUNTY,
Watertown, South Dakota

COLLIN COUNTY,
McKinney, Texas

COLORADO STATE PATROL,
Alamosa, Colorado

COLUMBIA COUNTY,
Portage, Wisconsin

CONVENTION AND VISITORS
BUREAU OF GREATER KANSAS
CITY,
Kansas City, Missouri

COOK MEMORIAL PUBLIC
LIBRARY DISTRICT,
Libertyville, Illinois

CRAWFORD COUNTY,
Prairie Du Chien, Wisconsin

CROW WING COUNTY,
Brainerd, Minnesota

CUMBERLAND COUNTY,
Carlisle, Pennsylvania

DAKOTA COUNTY,
Hastings, Minnesota

DAKOTA COUNTY HRA,
Rosemount, Minnesota

DANE COUNTY,
Madison, Wisconsin

DANE COUNTY REGIONAL
AIRPORT,
Madison, Wisconsin

DANE COUNTY SOCIAL SERVICES,
Madison, Wisconsin

DAVIS COUNTY,
Bloomfield, Iowa

DECATUR COUNTY,
Leon, Iowa

DELAWARE COUNTY,
Manchester, Iowa

DES MOINES COUNTY,
Burlington, Iowa

DODGE COUNTY,
Juneau, Wisconsin

DODGE COUNTY,
Mantorville, Minnesota

DOOR COUNTY,
Sturgeon Bay, Minnesota

DOUGLAS COUNTY,
Alexandria, Minnesota

DOUGLAS COUNTY,
Douglasville, Georgia

DUBUQUE COUNTY,
Dubuque, Iowa

DUNKLIN COUNTY,
Kennett, Missouri

DUNN COUNTY,
Menomonie, Wisconsin

EASTSIDE SUBURBAN
EMERGENCY COMMUNICATIONS
CENTER,
Reynoldsburg, Ohio

EAU CLAIRE COUNTY,
Eau Claire, Wisconsin

FAYETTE COUNTY,
West Union, Iowa

FEDERAL RESERVE BANK,
Minneapolis, Minnesota

FOND DU LAC COUNTY,
Fond du Lac, Wisconsin

FRANKLIN COUNTY,
Union, Missouri

FREMONT COUNTY,
Sidney, Iowa

GRAND COUNTY TELEPHONE
AUTH. BOARD,
Winter Park, Colorado

GRAND RAPIDS LIBRARY,
Grand Rapids, Minnesota

GRANT COUNTY,
Lancaster, Wisconsin

GREEN LAKE COUNTY,
Green Lake, Wisconsin

GREENE COUNTY,
Springfield, Missouri

GRUNDY COUNTY,
Grundy Center, Iowa

HANCOCK COUNTY,
Carthage, Illinois

HANCOCK COUNTY,
Garner, Iowa

HARDIN COUNTY,
Eldora, Iowa

HENNEPIN COUNTY,
Minneapolis, Minnesota

HO CHUNK NATION TRIBAL
JUSTICE CENTER,
Black River Falls, Wisconsin

HOWARD COUNTY,
Cresco, Iowa

IOWA COUNTY,
Dodgeville, Wisconsin

IRON COUNTY,
Hurley, Wisconsin

JACKSON COUNTY,
Black River Falls, Wisconsin

JACKSON COUNTY,
Maquoketa, Iowa

JASPER COUNTY,
Newton, Iowa

JEFFERSON COUNTY,
Fairfield, Iowa

JEFFERSON COUNTY,
Jefferson, Wisconsin

JO DAVIESS COUNTY,
Hanover, Illinois

JOHNSON COUNTY,
Iowa City, Iowa

JONES COUNTY,
Anamosa, Iowa

JUNEAU COUNTY,
Mauston, Wisconsin

KANABEC COUNTY,
Mora, Minnesota

KANE COUNTY,
Geneva, Illinois

KANSAS CITY AREA
TRANSPORTATION AUTH.
(KCATA),
Kansas City, Missouri

KANSAS CITY POLICE
DEPARTMENT,
Kansas City, Missouri

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| KENOSHA COUNTY, Kenosha, Wisconsin | MAYO CIVIC CENTER, Rochester, Minnesota | O'BRIEN COUNTY, Primghar, Iowa |
| KEOKUK COUNTY, Sigourney, Iowa | MCDONOUGH COUNTY, Macomb, Illinois | OCONTO COUNTY, Oconto, Wisconsin |
| KEWAUNEE COUNTY, Kewaunee, Wisconsin | McHENRY COUNTY, McHenry, Illinois | OSCEOLA COUNTY, Sibley, Iowa |
| KIT CARSON COUNTY, Burlington, Colorado | MCLEOD COUNTY, Glencoe, Minnesota | OUTAGAMIE COUNTY, Appleton, Wisconsin |
| KNOX COUNTY, Knoxville, Tennessee | METROPOLITAN AIRPORTS COMMISSION, St. Paul, Minnesota | OWATONNA PUBLIC UTILITIES, Owatonna, Minnesota |
| KOOTENAI COUNTY, Coeur D' Alene, Idaho | METROPOLITAN COUNCIL, St. Paul, Minnesota | OZAUKEE COUNTY, Port Washington, Wisconsin |
| LACROSSE COUNTY, La Crosse, Wisconsin | METROPOLITAN TRANSIT COMMISSION, Minneapolis, Minnesota | PAGE COUNTY, Clarinda, Iowa |
| LAFAYETTE COUNTY, Darlington, Wisconsin | MILLE LACS DRIFTSKIPPERS SNOWMOBILE CLUB, Isle, Minnesota | PARK COUNTY, Fairplay, Colorado |
| LAKE COUNTY, Baldwin, Michigan | MILLS COUNTY, Glenwood, Iowa | PIERCE COUNTY, Ellsworth, Wisconsin |
| LANGLADE COUNTY, Antigo, Wisconsin | MINNEHAHA COUNTY, Sioux Falls, South Dakota | PINE COUNTY, Pine City, Minnesota |
| LEE COUNTY, Dixon, Illinois | MINNESOTA CORRECTIONAL FACILITY, St. Cloud, Minnesota | PLYMOUTH COUNTY, Remsen, Iowa |
| LEE COUNTY, Fort Madison, Iowa | MINNESOTA DEPARTMENT OF CORRECTIONS, St. Paul, Minnesota | POCAHONTAS COUNTY, Pocahontas, Iowa |
| LESUEUR COUNTY, Le Center, Minnesota | MITCHELL COUNTY, Osage, Iowa | POLK COUNTY, Balsam Lake, Wisconsin |
| LINCOLN COUNTY, Merrill, Wisconsin | MONONA COUNTY, Onawa, Iowa | POLK COUNTY, Des Moines, Iowa |
| LINN COUNTY, Cedar Rapids, Iowa | MONROE COUNTY, Tomah, Wisconsin | PORTSMOUTH METROPOLITAN HOUSING AUTHORITY, Portsmouth, Ohio |
| LISLE I-NET CONSORTIUM, Lisle, Illinois | MORRISON COUNTY, Little Falls, Minnesota | POWESHIEK COUNTY, Montezuma, Iowa |
| LOUISA COUNTY, Wapello, Iowa | MOWER COUNTY, Austin, Minnesota | PRICE COUNTY, Phillips, Wisconsin |
| LOWELL HOUSING AUTHORITY, Lowell, Massachusetts | MUSCATINE COUNTY, West Liberty, Iowa | PUBLIC BUILDING COMMISSION OF CHICAGO, Chicago, Illinois |
| LYON COUNTY, Rock Rapids, Iowa | NORTHWEST REGIONAL RADIO BOARD, Bemidji, Minnesota | PUBLIC HOUSING AGENCY OF THE CITY OF SAINT PAUL, St. Paul, Minnesota |
| MANITOWOC COUNTY, Manitowoc, Wisconsin | | RAMSEY COUNTY, St. Paul, Minnesota |
| MARATHON COUNTY, Wausau, Wisconsin | | |
| MARQUETTE COUNTY, Montello, Wisconsin | | |

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| REDWOOD COUNTY, Redwood Falls, Minnesota | SIoux COUNTY, Orange City, Iowa | VILLAGE OF WINNETKA, Winnetka, Illinois |
| RICE COUNTY, Faribault, Minnesota | SOUTH DUNKLIN COUNTY, Hornersville, Missouri | VOLUSIA COUNTY, DeLand, Florida |
| RICHLAND COUNTY, Richland Center, Wisconsin | ST. LOUIS COUNTY, Duluth, Minnesota | WALWORTH COUNTY, Elkhorn, Wisconsin |
| RICHLAND COUNTY, Wahpeton, North Dakota | STATE OF COLORADO, Denver, Colorado | WAPELLO COUNTY, Ottumwa, Iowa |
| RICHMOND HEIGHTS, Richmond Heights, Missouri | STATE OF WISCONSIN, Madison, Wisconsin | WARREN COUNTY, Warrenton, Missouri |
| ROBBINSDALE POLICE DEPT., Robbinsdale, Minnesota | STEARNS COUNTY, St. Cloud, Minnesota | WASHBURN COUNTY, Shell Lake, Wisconsin |
| ROCK COUNTY, Janesville, Wisconsin | STEELE COUNTY, Owatonna, Minnesota | WASHINGTON COUNTY, Blaire, Nebraska |
| ROCK COUNTY, Luverne, Minnesota | STEVENS COUNTY, Morris, Minnesota | WASHINGTON COUNTY, Stillwater, Minnesota |
| ROCK RIVER WATER RECLAMATION DISTRICT, Rockford, Illinois | STODDARD COUNTY, Dexter, Missouri | WASHINGTON COUNTY, West Bend, Wisconsin |
| RUSK COUNTY, Ladysmith, Wisconsin | STORY COUNTY, Nevada, Iowa | WAUKESHA COUNTY, Waukesha, Wisconsin |
| SAINT CROIX COUNTY, Hudson, Wisconsin | TAMA COUNTY, Toledo, Iowa | WAUSHARA COUNTY, Wautoma, Wisconsin |
| SAINT PAUL CIVIC CENTER, St. Paul, Minnesota | TAYLOR COUNTY, Medford, Wisconsin | WEST CENTRAL INTEROPERABILITY ALLIANCE (WCIA), Wisconsin |
| SAINT PAUL PUBLIC LIBRARY, St. Paul, Minnesota | TOWN OF ADDISON, Dallas, Texas | WHITE COUNTY, Carmi, Illinois |
| SAN LUIS VALLEY COUNTY, Alamosa, Colorado | TOWN OF GLASTONBURY, Glastonbury, Connecticut | WHITESIDE COUNTY, Morrison, Illinois |
| SANGAMON COUNTY, Springfield, Illinois | TRAVERSE COUNTY, Wheaton, Minnesota | WINNEBAGO COUNTY, Forest City, Iowa |
| SARPY COUNTY, Papillion, Nebraska | TREMPEALEAU COUNTY, Whitehall, Wisconsin | WINNESHIEK COUNTY, Decorah, Iowa |
| SAUK COUNTY, Baraboo, Wisconsin | VERNON COUNTY, Viroqua, Wisconsin | WINONA COUNTY, Winona, Minnesota |
| SAWYER COUNTY, Hayward, Wisconsin | VILAS COUNTY, Eagle River, Wisconsin | WISCONSIN, STATE OF, DEPARTMENT OF REVENUE, Madison, Wisconsin |
| SEVEN-COUNTY METROPOLITAN PROJECT, Minneapolis, Minnesota | VILLAGE OF DEERFIELD, Deerfield, Illinois | WOOD COUNTY, Wisconsin Rapids, Wisconsin |
| SHEBOYGAN COUNTY, Sheboygan, Wisconsin | VILLAGE OF GERMANTOWN, Germantown, Wisconsin | WOODBURY COUNTY, Sioux City, Iowa |
| SHERBURNE COUNTY, Elk River, Minnesota | VILLAGE OF GURNEE, Gurnee, Illinois | |
| | VILLAGE OF WESTON, Weston, Wisconsin | |

SECTION 3: Response to Technical Requirements

Overview

E&A understands that Orange County is seeking a consultant to provide professional consulting, planning, and facilitation services relative to its short and long-term radio communications and interoperability needs. The result of the study will determine the most economical, efficient, reliable, and state-of-the-art method for designing and provisioning a new countywide radio communications system used by local government entities.

It is understood the County today operates using the State's VIPER P25 Trunked Radio System which is enhanced through the use of a VHF voice-tone system to page out fire departments. Further, it is understood there are a number of individual radio systems serving Solid Waste, Orange County Transportation, and local government operations such as schools, public works, and Orange Water and Sewer Authority.

Issues to Be Addressed

As Orange County is a user of the state system of which it is assumed they have little control over, operational issues are not causing the County to determine if there is a better solution. Specific problems to be addressed include tower channel imbalance, poor coverage in some areas, in-building coverage problems, and cost of ownership. Policymakers in Orange County wish to have a clear and definitive solution direction.

Phase I – Analysis of System Needs, Development of Options, Recommendations, and Projected Costs

During the review and analysis, E&A would do the following:

Assessment Work Plan

- TASK 1 -** Meet with the County leadership (review committee) assigned to this project to discuss and gain a greater understanding of the various land mobile radio systems installed and presently in use and expected to be addressed in the study. {First Face to Face Meeting}
- Create list of all County users making use of VIPER system.
 - Create list of all County users interested in a County radio system.
 - Create list of all existing radio system infrastructure in the County.
 - Create list of contacts for each group expressing interest in solution.
 - Discuss expectations of stakeholder involvement in the project.
 - Develop a routine for update conference calls and meetings.
- TASK 2 -** Throughout the project, E&A will expect to maintain at a minimum bi-weekly contact with the sponsor and any other review committee members via conference call and as required face to face meetings.

- TASK 3** - Review the preliminary discussions and any internal needs assessment that has been previously conducted.
- TASK 4** - Conduct detailed physical site survey of all existing radio system sites to determine needs for upgrades of physical facilities and available space: {First Site Visit Trip}
- Towers and visual load capability
 - Equipment shelters
 - Back-up power (batteries and generator)
 - Grounding
 - Rack/floor space
- TASK 5** - Collect and interpret collected data relative to frequencies, interoperability, interference, emergency backup, grounding, backhaul, and encryption requirements with the result a written findings document:
- VIPER Interface focusing on interoperability
 - Interoperability with University of North Carolina – Chapel Hill
 - Interoperability with surrounding counties
 - Available VIPER sites/locations
 - Backhaul (microwave, fiber, etc.)
 - Licensing/frequency issues
- TASK 6** - Develop an understanding of the present voice systems, adequacies and inadequacies. During this process, coverage analysis will also be conducted to validate areas where improvements are needed including:
- RF coverage
 - Equipment lifecycle and reliability
 - System loading and usage
 - RF sites and facilities
 - Subscriber terminal capabilities
 - System deficiencies
 - Discussions with the leadership of VIPER
- TASK 7** - Develop an understanding of the present tone/voice paging system, adequacies and inadequacies. (During this process, coverage analysis will also be conducted to validate areas where improvements are needed.)
- TASK 8** - Hold meetings with radio system user groups {Second Group of Meetings}
- What works and what does not work as desired
 - Coverage issues from user perspective
 - Interoperability issues within the county and adjacent operations
 - System governance
 - Subscriber radio equipment needs
 - Logging requirements

TASK 9 - Meet with representatives of groups identified as possible users of an updated system that today operate their own system. {Second Group of Meetings}

TASK 10 - Review FCC licenses for accuracy and note discrepancies.

TASK 11 - Analyze the available frequencies spectrum now in use and possible for use in the area and review future capacity needed to support system expansion.

TASK 12 - Assess other County public safety communications subsystems: {Possible 2nd Site Visit if Required}

- 800 conventional systems (8TAC, etc.)
- VHF emergency management system
- VHF/UHF paging
- 800 MHz bidirectional amplifiers
- Interop communications equipment

TASK 13 - Meet with present supporting vendor(s) to gain detailed technical information on present system performance and options the vendor recommends. {Possible 2nd Site Visit if Required}

TASK 14 - Conduct coverage analysis using the existing tower/repeater locations and validate outcomes with user groups.

TASK 15 - Review issues related to interoperability within the County, state and region, and adjacent public safety operations.

TASK 16 - Review the neighboring public safety agencies for mutual aid needs as related to the communications system design.

TASK 17 - Review the Orange County Communications Center as to its capabilities and location. {Possible 2nd Site Visit if Required}

TASK 18 - Review the Orange County Backup Communications Center as to its capabilities and location. {Possible 2nd Site Visit if Required}

TASK 19 - Review Fire and EMS station alerting infrastructure and interfaces.

Study Expectations

TASK 20 - Provide initial possible options for improvement of the radio voice radio system that would meet the objectives to improve the radio system and associated services. Review and discussion to include overview of:

- Radio system options (leased, owned, shared, etc.)
- Repeater locations to meet coverage expectations
- Frequency/channel utilization and licensing
- Interconnect infrastructure
- Base station site improvements
- Interoperability with VIPER system (ISSI Gateway)
- High level budgetary costs

TASK 21 - Review the effort creating possible options as developed in Task 20 with County leadership and gain further input as to the directions being taken thus far. {Likely 2nd Face to Face Meeting}

TASK 22 - Consider the possible use of existing radio sites and review other possible sites as appropriate to serve the required coverage area.

TASK 23 - Develop a review of the systems that each of the major manufacturers offers today, how they are the same and their differences at the time the report is developed.

TASK 24 - Assist the County leadership team in the understanding of the recommendations for the communications infrastructure that is used to interconnect the various elements of the radio systems including:

- Backhaul solutions: microwave and fiber optics
- How MPLS network technology fits into solutions

TASK 25 - Assist the County leadership team to become aware of the process of developing communication sites and towers.

- Insure team understands the various steps and costs both in time and dollars to build these 30+ year investments.
- Insure team understands site leasing option.
- Review options for site development as part of the total project or to be handled in conjunction with separate bidding.

TASK 26 - Assist with the identification of alternate funding sources such as grants and intergovernmental agreements with city/county and other agencies.

- TASK 27** - Review during conference calls and for inclusion in the report the possibilities for procurement, operation, and management of radio system
- County to procure the core and end-users procure their own end-user equipment.
 - County to procure the core infrastructure and all end-user equipment.
 - County to procure the core infrastructure and all end-user equipment with end-users enhancing the infrastructure to create needed coverage improvements and other identified issues.

- TASK 28** - Develop a draft report summarizing the findings of the technical systems assessment and the findings of the operational assessment based on user interviews and surveys. The report shall provide the following sections or information at a minimum:

- Summary of the technical analysis of the current systems hardware, software and supporting infrastructure
- Backbone equipment inventory and condition
- A discussion and recommendation regarding APCO P25 trunking technology ownership, leasing, use of shared infrastructure, etc.
- Pros and cons of each option offered, advantages/disadvantages
- Backhaul requirements related not only to LMR but also future needs
- A discussion of interoperability with adjacent radio systems
- Band/frequency availability (VHF, UHF, 700, 800)
- Interoperability with other user group radio systems
- Analog, digital (Phase 1 and Phase 2 air interface)
- Operating protocol (conventional, trunked, hybrid)
- Encryption and general operation with trunked radio systems
- Single vs. multiple infrastructure to serve various user groups
- Stakeholder involvement expectations as the project moves forward
- Lifecycle and support issues
- Site and facility conditions and issues
- Subscriber equipment inventory and status
- Summary of findings on available frequency spectrum and recommendations for capacity expansion
- Recommendations for prioritization to address the issues and gaps identified through these assessments
- Identification of issues and recommendations of infrastructure components to be retained for reuse or replaced including sites, shelters and buildings, towers, backhaul, generators and uninterruptible power supplies
- Identification of issues and recommendations as related to the Orange County Communications Center and backup center

- Recommendations and alternatives for system/equipment upgrade or replacement needed to address the areas of concern. For each identified recommendation or alternative, address:
 - Pros and cons of the solution including coverage expectations
 - Areas impacted (RF sites, dispatch, etc.)
 - Ease of migration
 - Frequency plan requirements
 - Anticipated timeline for project options
 - Budgetary cost estimates for implementation
- System procurement options review and recommendation
 - County to procure the core and end-users procure their own end-user equipment
 - County to procure the core infrastructure and all end-user equipment
 - County to procure the core infrastructure and all end-user equipment with end-users enhancing the infrastructure to create needed coverage improvements and other identified issues
- Early timeline describing element of bidding and acquisition thorough award, construction, testing, commissioning and acceptance
- Discussion of next steps including development of a Request for Proposal and plan for acquisition through deployment.

TASK 29 - Present “draft report of findings and identified potential recommendations” to County leadership (review committee) for discussion and confirmation of the direction being taken. {3rd Face to Face Meeting}

TASK 30 - After review of the options in the draft report as presented in Task 28 and acceptance of the “best option,” Elert & Associates will finalize the selected “best option” that meets the needs. E&A will provide a final written report of findings:

- Conceptual design detail for voice radio, backhaul interconnect, site improvements and interoperability
- System conceptual design drawings
- Anticipated coverage using propagation analysis
- Possible transition plan for updated system
- Estimated system budgetary costs
- Anticipated timeline for phased approach
- Stakeholder involvement expectations

TASK 31 - Present final report of findings and recommendations to County leadership (review committee) for discussion and confirmation of the direction being taken. {4th Face to Face Meeting}

Vendor Neutral Proposal

Phase IIa – Plan of Action for Acquisition of System and RFP

Our anticipated project plan would begin with a project kick-off meeting, a review of what has transpired in meetings, and correspondence about the project since the Needs Assessment (Phase I) was completed. A discussion will then be held with County public safety leadership to review what has been discovered and to reach a consensus as how to move forward creating an acquisition of a radio system meeting the expectations of the County.

TASK 32 - Phase II Plan

- Key project milestones
- Planned meetings and update conference calls
- Timeline mapped to be compatible with County budget cycles
- Expected stakeholder engagement

TASK 33 - Update the inventory of the County-owned end-user radios.

- Provide radio count by manufacturer, model, version and user
- Current radio programming mask
- Subscriber radio accessories

TASK 34 - Review the Needs Assessment and gain any additional input from the stakeholders.

- Expected coverage, both mobile and portable
- Possible tower site options/needs
- Expected system management options and responsibilities
- Funding strategies
- Interconnect capability
- Interoperability within the County and with its neighboring agencies

TASK 35 - Update and finalize conceptual design to be included in the RFP for the radio system to serve the County.

- Coverage analysis using computer projections
- Awareness of problems
- County expectations
- Features: OTAR, OTAP, encryption, etc.
- Option for inter-subsystem interfaces (direct and P25 ISSI)
- Collecting, summarizing, and interpreting options

TASK 36 - Develop detailed description of the current radio site facilities for available space, power, HVAC, tower loading, and believed structural capacity.

TASK 37 - Update radio dispatch console requirements for upgrade at both the primary and backup PSAPs.

TASK 38 - Re-analyze frequencies availability.

TASK 39 - Introduce information about existing trunked systems in the area.

TASK 40 - Arrange a vendor session to understand the technology offerings and capabilities (optional and if desired).

TASK 41 - Provide routine status reports of progress.

TASK 42 - E&A will upon acceptance and authorization to proceed, develop system design specifications to be utilized with a RFP for acquisition.

- Work with the County purchasing and legal departments to include all required language for an open RFP process.
- Insure the RFP has all needed elements:
 - Terms and conditions (by Orange County)
 - Anticipated timeline
 - Radio system technical specifications
 - Backhaul and network technical specifications
 - Interoperability requirements:
 - ✓ State of North Carolina (VIPER)
 - ✓ University of North Carolina
 - ✓ Adjoining county fire and EMS
 - Power and alarm system technical specifications
 - Design offering requirements
 - Site work requirements
 - Anticipated management system
 - FCC/FAA/NEPA regulatory issues/resolution
 - System testing and acceptance criteria
 - Cutover/transition plan expectations
 - Subscriber terminal equipment/accessories to be supplied
 - Fleet mapping and training requirements
 - Evaluation criteria to be included in the RFP

E&A Deliverables for Phase IIa

- Final conceptual plan to be included in RFP
- Vendor neutral RFP with technical specifications and requirements matrix
- Evaluation criteria

Vendor Neutral Proposal

Expectations of County: Gain authorization to publish the RFP.

Phase IIb – System Procurement Process, Contract Negotiations and Award

The E&A anticipated project plan for this phase is to support Orange County in the proposal process including holding pre-proposal meeting, respond to proposer questions, evaluation of responses to the RFP from the proposers and recommendation.

TASK 43 - Assist County Purchasing with the release of the RFP.

TASK 44 - Attend and take an active role in the pre-proposal meeting and site visits.

TASK 45 - Develop responses to all proposer questions working with County Purchasing.

TASK 46 - Develop any needed additions, addenda and revisions to the RFP.

TASK 47 - Review all received vendor proposals and take part in possible interviews.

TASK 48 - Develop a comparison document report for the County review committee describing how proposals meet the needs as outlined in the RFP.

TASK 49 - Take part in vendor interviews (if required).

TASK 50 - Participate in contract negotiations with selected vendor (if required).

TASK 51 - Provide routine status reports.

E&A Deliverables for Phase IIb

The following Proposer documents will be closely reviewed and details worked out between the County and selected Contractor to meet project objectives:

- Vendor proposal written comparison for county review team
- Cost comparison of proposals
- System description summaries for receive proposals
- Statement of work review

Expectations of County: Develop a contract with the successful vendor.

Contract Administration after Award

Phase III – System Implementation (Optional)

The E&A anticipated project plan for Phase III is to support Orange County with the necessary support (contract administration) to execute system final design and build-out through cutover to the new radio system.

Our experience in previous like projects is a team approach that will insure our ability to meet the needs of the County for the updated system. Our specific areas of expertise are related to the review of the work of the selected contractor and ultimately their plan for implementation.

Note: Some of the work plan elements described are shown with an *, which should be taken to mean it is possible Elert & Associates will recommend the services of and subcontract a local civil/ structural engineering firm to assist as it has been found having local support can enhance the overall project. There is also cost savings in some designs to bid the civil/structural work separately from the radio and microwave technology. If new towers or extensive modification of existing towers are involved in this design, it may also require conducting NEPA, SHPO and FAA studies prior to gaining FCC licenses.

- TASK 1** - E&A will conduct the initial kick-off meeting with the awarded contractor and re-establish the expected ground rules for the project and its management.
- TASK 2** - E&A will share with the contractor as much design detail as possible to insure as much information is offered that has been collected to date.
- TASK 3** - E&A will support the County by reviewing, recommending and/or commenting on the Detailed Design Review Phase.
- TASK 4** - E&A will participate in weekly meetings and provide monthly status reports.
- TASK 5** - E&A will lead project meetings, provide meeting agendas and minutes, both off and onsite and track actions items for all parties.
- TASK 6** - E&A will maintain the overall project schedule.
- TASK 7** - E&A will perform regulatory management processes and filings including FCC licensing, NEPA reporting, Environmental Impact Reporting, site leases and local zoning and planning efforts, construction management and oversight. *
- TASK 8** - E&A will conduct risk management tracking process. *
- TASK 9** - E&A will provide construction and civil work management on all radio sites. *

TASK 10 - E&A will review vendor manufacturing orders and inventory all equipment.

TASK 11 - E&A will assist with fleetmap development and interoperability planning.

TASK 12 - E&A will edit, enhance and improve vendor supplied test plans.

TASK 13 - E&A will oversee Factory and Field Testing (including Coverage Testing) of systems.

TASK 14 - E&A will oversee and verify infrastructure and radio installation.

TASK 15 - E&A will conduct tower climb inspections of antenna and transmission line installation. *

TASK 16 - E&A will maintain a punch list and issues log.

TASK 17 - E&A will assist contractor and County in the creation of detailed procedural transition and cutover plans.

TASK 18 - E&A will review and assist in the development of system backup and failure plans.

TASK 19 - E&A will review training materials and facilitate training as provided by vendor.

TASK 20 - E&A will take an active participant role in the final voice coverage acceptance test.

TASK 21 - E&A will oversee final commissioning of the system.

TASK 22 - E&A will review final documentation as provided by vendor.

TASK 23 - E&A will conduct final project closeout.

E&A Deliverables for Phase III

The following Proposer documents will be closely reviewed and details worked out between the County and selected Contractor to meet project objectives:

- Fleetmap development and interoperability planning.
- Contract documents
- System description summary
- Statement of work review
- Acceptance test plans
- Backup and failover plans
- Warranty and support plans
- Project management plan

- Work schedule with routine updates
- Regulatory filings and documentation
- Detailed design documentation updated from redlines
- Updated construction drawings
- Detailed cutover plan
- Final fleetmap and radio templates
- Backup plans and procedures

Elert & Associates will provide to the County leadership routine reports:

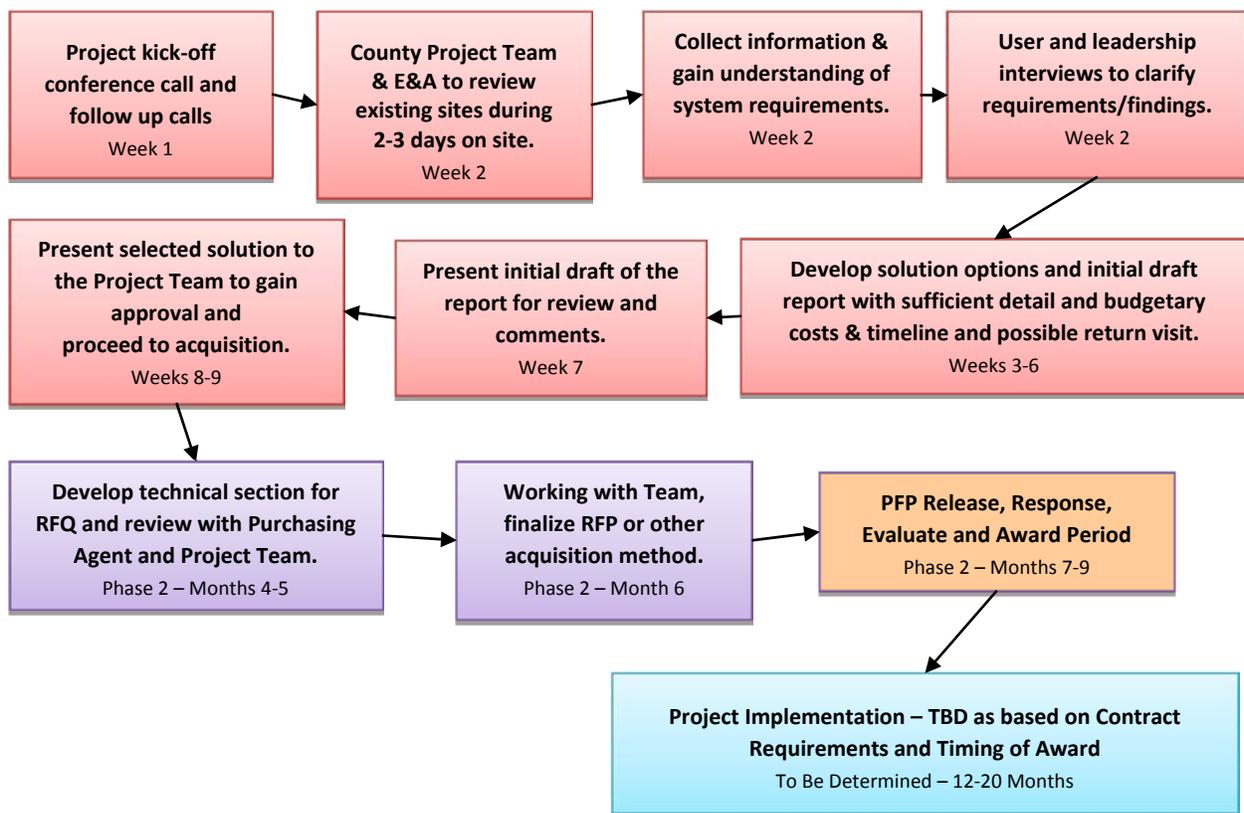
- Project status
 - Pricing documents
 - Review change requests
 - Monthly status reports
 - Routine updates of the schedule
- Review documents with outcomes from discussions and agreements with the selected contractor to become the work template.
- Regulatory filings and documentation
- Punch list documentation
- Review of the final system documentation as provided by Contractor
- Project closeout

Timeline

The expectation of Elert & Associates would be to start the project once awarded within two weeks to allow for schedules to be established for a conference call and set travel for the initial visit, this the start of Phase I. The initial fact gathering portion of the work generally requires about two months to be completed and another 2-3 weeks for the client to review and make adjustments.

Acquisition Support (Phase II) will easily consume another two months or more depending on the County’s review of the draft and final RFP and providing input in a timely manner. Thus, the project is now at the six month point and ready for the RFP to be released. Once the RFP is released, conduct the pre-proposal meeting and site visits, answer questions from vendors, allow for respondents to develop proposals, and then evaluate the responses. Three more months have now typically passed.

The graphic below describes the entire project in a simple format of the steps and time generally required as outlined. Pauses and delays can occur in the timeline where necessary and are sometimes beyond anyone’s ability to control.



Some clients have found it useful to hold a vendor show & tell presentation before the RFP has been completed to allow for questions, vendors to get excited about the project, and clients to see the various products to be offered. Also, during the RFP grading process, it may be necessary to bring in the finalist for a presentation prior to award.

SECTION 4: Cost Proposal

Please see cost proposal under separately sealed envelope.

SECTION 5: Required Forms

Please see required Attachments on the following pages:

- Attachment A – Signature Affidavit
- Attachment B – Vendor Data Sheet
- Attachment C – References
- Addendum #1 Acknowledgement
- Addendum #2 Acknowledgement
- Addendum #3 Acknowledgement

Attachment A

SIGNATURE AFFIDAVIT

In signing this proposal, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a proposal; that this proposal has been independently arrived at without collusion with any other proposer competitor or potential competitor; that this proposal has not been knowingly disclosed prior to the opening of proposals to any other proposer or competitor; that the above statement is accurate under penalty of perjury.

The undersigned, submitting this proposal, hereby agrees with all the terms, conditions and specifications required by the County in this Request for Proposal, and declares that the attached proposal and pricing are in conformity therewith.

Dave Kaun
Name (Type or Print)

CTO
Title

Dave Kaun
Signature

Elert & Associates Networking Division, Inc.
Firm

140 Third St S, Stillwater, MN 55082
Address: (Street, City, State, Zip Code)

651-705-1232
Telephone

651-430-2661
Fax

dave.kaun@elert.com
E-Mail

02-23-2016
Date

Attachment B

VENDOR DATA SHEET

- 1. Proposing Company Name** Elert & Associates Networking Division, Inc.
- Telephone 651-430-2772 Toll Free Telephone _____ Fax 651-430-2661
- Address: 140 Third St S
- City: Stillwater State: Minnesota Zip + Four: 55082-4902
- 2. Contact Person in the event there are questions about your proposal**
- Name: Dave Kaun Title: CTO
- Telephone: 651-705-1232 Toll Free Telephone: _____
- Address: 408 Lee Lambert Rd
- City: Maryville State: Tennessee Zip + Four: 37803
- 3. Mailing address where County purchase orders/contracts are to be mailed and person the Department can contact concerning orders and billing.**
- Name: Ron Bundy Title: Sales Associate
- Telephone: 651-705-1241 Toll Free Telephone: _____
- Address: 140 Third St S
- City: Stillwater State: Minnesota Zip + Four: 55082

Attachment C

REFERENCES

Provide company name, address, contact person, telephone number, and appropriate information on the product(s) and/or service(s) used for three (3) or more installations/services with requirements similar to those included in this solicitation document. If vendor is proposing any arrangement involving a third party, the named references should also be involved in a similar arrangement.

Company Name: City of LaCrosse, Wisconsin
Company Address: 400 LaCrosse St, LaCrosse, WI 54601
Telephone/email: 608-789-8225/greschnerj@cityoflacrosse.org
Contact Person: Ms. Jacky Greschner
Services provided by proposer/vendor: Radio System Assessment, Strategic Plan, and Upgrade

Company Name: Linn County, Iowa
Company Address: 310 2nd Ave SW, Cedar Rapids, IA 52406
Telephone/email: 319-892-6116/david.knott@linncounty.org
Contact Person: Cpt. Dave Knott
Services provided by proposer/vendor: Multi-Entity Public Radio System Replacement

Company Name: Johnson County, Iowa
Company Address: 4529 Melrose Ave West, Iowa City, IA 52246
Telephone/email: 319-356-6888/tjones@co.johnson.ia.us
Contact Person: Mr. Tom Jones
Services provided by proposer/vendor: Public Safety Radio System Replacement

Company Name: Trempealeau County, Wisconsin
Company Address: 36245 Main St, Whitehall, WI 54773
Telephone/email: 715-538-4351/schreinerd@tremplcounty.com
Contact Person: Mr. Dan Schreiner
Services provided by proposer/vendor: Public Safety Radio System Replacement

Company Name:
Company Address:
Telephone/email:
Contact Person:
Services provided by proposer/vendor:



ORANGE COUNTY
NORTH CAROLINA

Orange County
Financial Services Department
ADDENDUM #1
February 8, 2016

| |
|---|
| RFQ 5217 |
| Countywide Radio Communications Interoperability And Systems Engineering Services |

To all Vendors:

Modifications to bid documents for the above-named Request for Proposal are made as follows and shall be included in the proposed amount.

Questions received with County's responses are on page 2 of this document

All other terms and conditions shall remain the same

By: David E. Cannell, Purchasing Agent; dcannell@co.orange.nc.us / (919) 245-2651

Acknowledgement of receipt of this addendum shall be included with your submittal

Company Name: Elert & Associates Networking Division, Inc.
By: Ron Bundy 
Date Received: 02/08/2016

P.O. Box 8181 200 South Cameron Street Hillsborough, North Carolina 27278
Telephones: Area Code 919-245-2651 Fax: 919-636-4913



ORANGE COUNTY
NORTH CAROLINA

Orange County
Financial Services Department
ADDENDUM #2
February 12, 2016

| |
|---|
| RFQ 5217 |
| Countywide Radio Communications Interoperability And Systems Engineering Services |

To all Vendors:

Modifications to bid documents for the above-named Request for Proposal are made as follows and shall be included in the proposed amount.

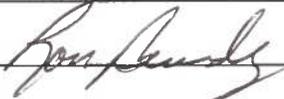
The due date has been extended to March 1, 2016 at 5:00 pm. We anticipate issuing at least one additional addendum to address questions received

All other terms and conditions shall remain the same

By: David E. Cannell, Purchasing Agent; dcannell@co.orange.nc.us / (919) 245-2651

Acknowledgement of receipt of this addendum shall be included with your submittal

Company Name: Elert & Associates Networking Division, Inc.

By: Ron Bundy 

Date Received: 02/15/2016

P.O. Box 8181 200 South Cameron Street Hillsborough, North Carolina 27278
Telephones: Area Code 919-245-2651 Fax: 919-636-4913



Orange County
Financial Services Department
ADDENDUM #3
February 23, 2016

| |
|---|
| RFQ 5217 |
| Countywide Radio Communications Interoperability And Systems Engineering Services |

To all Vendors:

Modifications to bid documents for the above-named Request for Proposal are made as follows and shall be included in the proposed amount.

Questions received with County's responses are on pages 2-4 of this document

All other terms and conditions shall remain the same

By: David E. Cannell, Purchasing Agent; dcannell@co.orange.nc.us / (919) 245-2651

Acknowledgement of receipt of this addendum shall be included with your submittal

Company Name: Eiert & Associates Networking Division, Inc.
By: Ron Bundy 
Date Received: 02/23/2016

P.O. Box 8181 200 South Cameron Street Hillsborough, North Carolina 27278
Telephones: Area Code 919-245-2651 Fax: 919-636-4913