<table>
<thead>
<tr>
<th>Review Criteria</th>
<th>MCP</th>
<th>Trott</th>
<th>CSI</th>
<th>Forrest</th>
<th>Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project Understanding</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Quality of the Proposed Solution</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>4. Proven Ability</td>
<td>Over 10 years of documented experience, managed over 1,285 infrastructure projects</td>
<td>Over 40 years of documented experience, managed over 200 infrastructure projects. Has worked on previous radio projects with COS</td>
<td>Several years of experience, has worked on previous radio projects with COS</td>
<td>Several years of experience, has worked on previous radio projects with COS</td>
<td>Fail</td>
</tr>
<tr>
<td>5. Completeness of the Proposal</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>6. Local Vendor</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Cost</td>
<td>$188,896.00</td>
<td>$73,650.00</td>
<td>$105,570.00</td>
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</table>

**Total**

<table>
<thead>
<tr>
<th>Review Criteria</th>
<th>MCP Rating</th>
<th>Trott Rating</th>
<th>CSI Rating</th>
<th>Forrest Rating</th>
<th>Enterprise Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project Understanding</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>2. Quality of the Proposed Solution</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>4. Proven Ability</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<td>5. Completeness of the Proposal</td>
<td>5</td>
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<td>5</td>
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</tr>
<tr>
<td>6. Local Vendor</td>
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<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>7. Cost</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total**

|               | 22         | 24          | 25         | 27           | 13         |

*Rating from 1-5 (5 being the highest)*
Public Safety Radio
Infrastructure Replacement

Request for Proposal

PREPARED MARCH 20, 2020 FOR
CITY OF STOCKTON, CALIFORNIA
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Introduction Letter

March 20, 2020

Terrell Harper
City of Stockton
Enterprise Program Management Office
Information Technology
400 E. Main Street, 4th Floor
Stockton, CA  95202

Re: Public Safety Radio Infrastructure Replacement

Dear Mr. Harper:

Mission Critical Partners, LLC (MCP) appreciates the opportunity to provide this proposal to establish and recommend the most appropriate path for replacement and/or upgrade of the City of Stockton’s aging public safety systems to ensure reliable operations and future manufacturer support.

The MCP team serves as an independent agent with considerable experience in local government management roles, and extensive experience in performing public safety consulting services for state, local, and federal government entities.

As required, we are submitting the proposal via email to Terrell.Harper@stocktonca.gov.

Mission Critical Partners has identified Mike Lyons as the point of contact for this proposal response. His contact information follows:

Mike Lyons, VP of Business Development  Cell:  720.745.0267
Mission Critical Partners, LLC  Office:  888.862.7911
1512 Larimer Street, Suite 950  Fax:  814.217.6807
Denver, CO 80202  Email: MikeLyons@MissionCriticalPartners.com

I am the authorized representative signing and submitting this proposal on the company’s behalf and may be contacted at 888.862.7911 or JohnSpearly@MissionCriticalPartners.com.

On behalf of our entire team, we stand behind the City of Stockton to serve as your partner and your advocate.

Sincerely,

Mission Critical Partners, LLC

John L. Spearly
Vice President and Director of Administrative Services
About Mission Critical Partners

Mission Critical Partners (MCP) is an independent solutions provider that helps our clients enhance and evolve their mission-critical systems and operations in order to improve emergency response outcomes.

Through our breadth and depth of experience and an extensive network of resources, we offer innovative, vendor-independent and forward-thinking solutions that solve our clients’ complex challenges.

Our consulting, information technology (IT) support and data integration capabilities span all aspects of mission-critical communications, while our expertise covers everything from wireless and broadband, networks and 911, criminal justice, and facilities and operations. We provide confidence and support every step of the way, from procurement and design to implementation and management. The result is an integrated, high-performing emergency response ecosystem that achieves maximum value and optimal efficiency.

With MCP, the proof is in the numbers:

- Of our more than 135 specialized professionals, five reside in California and are dedicated to serving our California-based public safety clients.
- We offer a streamlined procurement process through our California Multiple Award Schedule (CMAS) Contract #3-13-70-3020A, Supplement No. 3.
- We’ve performed services for clients in nearly all 50 states with a full suite of solutions and services.
- We expand upon our experience year after year, completing more than 1,285 projects since our inception in 2009.
- We invest more than a million dollars each year to employee training.

MCP stands behind the importance and nobility of the work our clients do. We understand the criticality of effective and efficient emergency response systems, not just for our clients, but also for the communities they serve. While we are proud to have the most experienced and knowledgeable team of professionals in the industry, our greatest pride comes in seeing the successful results of our clients’ mission-critical operations.

Because at the end of the day, it’s the mission that truly matters.
Our Commitment to Vendor Neutrality

Partnering with a firm that brings an independent, objective perspective to every engagement is a top priority for the clients we serve. As an advocate for mission-critical agencies, MCP’s commitment is to always put the fundamental interests of our clients first.

From our inception, vendor-neutrality is a value that underpins every aspect of what we do. Our goal is to determine the most favorable solution for our clients based on their unique requirements, budget, governance structure, operations and existing technologies. We provide a holistic perspective of the entire emergency response ecosystem, free of bias or favoritism to any specific product or service provider. Our recommendations are always based on the value and the benefit provided to the client.

For clients, this approach means more control and greater visibility into the systems they are ultimately responsible for operating, and a successful project that improves emergency response.

Mission Critical Partners Board of Directors

R. Kevin Murray

Robert Chefitz

E. Perot Bissell

Bernard Bailey

Douglas Butler
Project Approach
The City of Stockton (City) is seeking recommendations to establish a path for the replacement or upgrade of its end of life systems to ensure reliable operations and future manufacture support. To support the City’s objectives, MCP has prepare a scope of work (SOW) using the following tasks:

Our solution is developed to minimize costs while producing meaningful results. We stand prepared to help the City realize its vision of procuring a system that achieves maximum value and optimal efficiency.

Our Solution

Task 1: Site Survey and Facility Requirements

Upon award, MCP will initiate the project with a kickoff meeting to introduce our team and verify alignment of expectations regarding the scope, outcomes, deliverables, and schedule.

The City will realize cost efficiencies by scheduling site visits for the same week as the kickoff meeting. The site and system environment will be assessed to complete the site survey and recommendations.

Task 2: Capacity Analysis and Requirements

To ensure the City has sufficient channels and spectrum to support upgrade and enhancement recommendations, MCP will evaluate system loading based on user feedback, review current Federal Communications Commission (FCC) licenses and spectrum, and research additional spectrum availability, including the use of Erlang C traffic calculations.

Task 3: FCC Regulatory Efforts

MCP will support development of a frequency plan, support FCC applications and construction extensions requests to ensure the City is compliant with FCC regulatory efforts.

Task 4: Assist with Vendor Scope of Work and Proposal Review

MCP will assist in developing a statement of work to conduct a sole source procurement to ensure the City receives a solution that fits current and future needs. MCP will also support the vendor proposal evaluation to ensure it meets requirements established in the SOW, and contract negotiations.
Our Team

Senior Leadership and Project Manager

- Our senior project leadership will:
  - Hold an advisory role throughout the course of the project
  - Be available, as needed, should the City identify issues or concerns that need to be addressed
- Our project manager is responsible for all day to day activities and coordination throughout Task 1-4

<table>
<thead>
<tr>
<th>Staff</th>
<th>Assignment</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scott Neal, ENP</td>
<td>Client Services</td>
<td>Ensure overall City satisfaction</td>
</tr>
<tr>
<td>Mike Lyons</td>
<td>Client Manager</td>
<td>Overall administrative support</td>
</tr>
<tr>
<td>Darek Wieczorek, PMP</td>
<td>Client Services</td>
<td>Day to day activities and project coordination</td>
</tr>
<tr>
<td>Craig Stevens</td>
<td>Alternate PM/Backhaul SME</td>
<td>Backup PM support and backhaul SME</td>
</tr>
</tbody>
</table>

Scott Neal, ENP is MCP’s Vice President and Director of Wireless Services and brings 33 years of radio experience including 28 years serving the Pennsylvania State Police (PSP). Scott served as Former Major and Director of the PSP Bureau of Communications and Information Services and was responsible for the operation and maintenance of the Statewide Radio Network (PA-STARNET).

Mike Lyons is MCP’s west coast regional representative and will support Scott Neal in ensuring the overall support and project success for the City and has supported projects in Colorado and California.

Darek Wieczorek, PMP brings more than 34 years of radio and industry experience and holds a project management professional (PMP) certification to ensure on-time and on-budget delivery. He has successfully deployed this methodology on assessment, design, and implementation projects across the country including the State of Arizona, California State University and QUADCOM, IL.

Craig Stevens, PMP brings 19 years of experience as an accomplished technical engineering management professional with extensive experience in telecommunications and government industries. Craig will serve as an alternate project manager and backhaul SME to support the project manager and the City throughout the course of the project.
Subject Matter Experts

MCP’s technical and subject matter experts (SMEs) are responsible for the specialized areas highlighted in the City’s request for proposal (RFP) including technology and FCC licensing and regulatory support.

<table>
<thead>
<tr>
<th>Staff</th>
<th>Assignment</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nick Falgiatore, ENP, PE</td>
<td>FCC SME</td>
<td>FCC licensing/regulatory support</td>
</tr>
<tr>
<td>Todd Johnson, PE</td>
<td>Technology SME</td>
<td>Technology/licensing support</td>
</tr>
<tr>
<td>Peter Hambuch</td>
<td>Technology SME</td>
<td>Technology</td>
</tr>
<tr>
<td>Scott Johnson</td>
<td>Radio SME</td>
<td>Technology</td>
</tr>
</tbody>
</table>

Nick Falgiatore brings more than 12 years of experience supporting radio projects and has represented agencies before the FCC and regional planning committees. Nick has supported licensing for Montana, Alamo Area Council of Government, TX (Region 53); Region 34 (Oklahoma), Gloucester County, NJ, Broward County, FL and in Pennsylvania including: Montgomery, York, Berks and Bucks counties.

Todd Johnson, PE is a licensed California Professional Engineer with more than 30 years of experience. Todd served as the City of Houston’s Assistant Director, one of the country’s largest public safety radio system technical sections and supported the conventional analog to digital Project 25 (P25) transition. Todd has more than 20 years as a radio frequency (RF) engineer experienced with design and assessment and development of system designs using RF propagation software.

Peter Hambuch is a California resident and technology specialist with a focus on wireless technologies experience includes P25 assessments, 700 megahertz (MHz) wireless broadband data, FirstNet, LTE, secure and scalable wireless land mobile radio systems, simulcast, and digital and analog. Peter has supported similar engagements for Arizona, California State University and Cincinnati, OH.

Scott Johnson brings more than 39 years of radio upgrade and replacement experience, including assessments, system design, FCC licensing, development of system specifications proposal evaluation, implementation assistance, acceptance testing and interoperability assistance. His experience includes projects for Maricopa County, AZ and Oklahoma City, OK.
Our Experience

Our approach outlined above is successfully completed leveraging our company and staff experience, including:

California and Regional Presence

- Local and regional resources supporting the project are located in California, Arizona, and Colorado
- Licensed California Professional Engineering (Todd Johnson)
- More than 84 projects across the state including the California Office of Emergency Services

Industry Experience

- Our team of eight SMEs collectively bringing 217 years’ experience to the project
- More than 3,000 years of collective expertise across our 135 SME’s
- More than 1,285 projects including P25 radio assessment, procurement and implementation

We leverage this experience and our vendor agonistic approach to always put the fundamental interests of the City first as highlighted in our scope of work on the following pages.
Task 1: Site Survey and Facility Requirements

Task 1.1: Project Kickoff Meeting

MCP will conduct a kickoff meeting with the City project team and stakeholder representatives to:

- Establish mutual acquaintance
- Clarify roles
- Review and confirm the desired outcomes and deliverables

MCP’s project manager, Darek Wieczorek, will facilitate the meeting and will review available documentation or materials that can be made available such as:

- Letters, surveys, and contracts
- As-built documentation
- (FCC documents and licenses
- Presentation materials and other items, as determined

The City and MCP will use Task 1.1 to gain a mutual understanding of the City’s specific expectations and definitions of success for this project.

Task 1.2: Site Evaluation and Recommendations

The City will recognize cost efficiencies by MCP’s scheduling of the site visits during the same week of the project kickoff meeting and will include:

- Eight tower sites
- Two public safety dispatch locations
- Public Works

For purposes of this task, MCP assumes the City will arrange for site access during the week of the kickoff meeting.

MCP will perform an evaluation to ensure a comprehensive review of the City’s environment to complete the two required deliverables requested by the City.

Given the impact sites have on coverage, site conditions will be assessed to determine available space, power and antenna tower requirements to determine any changes needed to support the new networks.

Site Survey

At the completion of Task 1, the City will receive a completed site survey. This survey will consist of data collected and analyzed during MCP’s on-site visit.
MCP understands the importance of radio sites as a vital extension of the system in that they allow communications equipment to run at optimum performance and provide:

- A secure space to house the equipment that provides communications to first responders
- Protection from natural and manmade threats

Radio sites are also an important factor when designing a new communications system, as it relates to site reliability, availability and functionality.

With that in mind, MCP’s site surveys are conducted to inventory the existing infrastructure, assess the condition of the existing facilities and their ability to support new or upgraded equipment in the future.

**Overall Site and Equipment Review**

MCP will assess the City’s current site capacity and existing radio infrastructure, including:

<table>
<thead>
<tr>
<th>Survey Areas</th>
<th>Site Capacity</th>
<th>Existing Radio Equipment Information Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site access</td>
<td></td>
<td>Hardware and software</td>
</tr>
<tr>
<td>Site security</td>
<td></td>
<td>Repeater systems</td>
</tr>
<tr>
<td>Emergency power</td>
<td></td>
<td>Associated backhaul (Connectivity between repeater/dispatch sites)</td>
</tr>
<tr>
<td>Shelter space</td>
<td></td>
<td>Coverage requirements</td>
</tr>
<tr>
<td>Antenna space</td>
<td></td>
<td>Dispatch console configuration and equipment</td>
</tr>
<tr>
<td>Power availability</td>
<td></td>
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</tbody>
</table>
**Evaluation Areas**

The City’s current configuration will be reviewed by MCP, including:

<table>
<thead>
<tr>
<th>Configuration Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cable and wiring management systems</td>
</tr>
<tr>
<td>- Power service and capacity</td>
</tr>
<tr>
<td>- Heating, Ventilation and Air Conditioning (HVAC)</td>
</tr>
<tr>
<td>- Interior grounding systems</td>
</tr>
<tr>
<td>- Lightning and surge protection systems</td>
</tr>
<tr>
<td>- Equipment installation and space</td>
</tr>
<tr>
<td>- Racks remaining in the facility and available space</td>
</tr>
<tr>
<td>- Evaluate serviceability</td>
</tr>
<tr>
<td>- Grounding system documentation</td>
</tr>
<tr>
<td>- Shelters</td>
</tr>
<tr>
<td>- Equipment cabinets</td>
</tr>
<tr>
<td>- Fences</td>
</tr>
<tr>
<td>- Grounding systems</td>
</tr>
<tr>
<td>- Visually assessed to document proper ground connection according to industry standards</td>
</tr>
</tbody>
</table>

MCP will suggest modifications which may be necessary to accommodate recommendations for upgrades.

**RF Location and Site Recommendations**

The City will receive a RF location and site recommendations review at the conclusion of Task 1.2.

MCP will:

- Document any lease or other restrictions that could hinder the use of the radio site
  - Ensure any issues related to access or use are vetted and documented in the deliverable

- Identify site internet protocol (IP) backhaul provisions available (microwave, fiber, Comcast, etc.)

- Other information on FCC license

- Confirm:
  - Coordinates
  - Tower height
  - Equipment shelter options
  - General site conditions
  - Site owner

MCP brings experience supporting site survey and recommendations, including our work with the Commonwealth of Massachusetts Interoperable Radio System (CoMIRS) system. With a planned capacity
of 94 radio sites, MCP visited the 34 sites currently in use to review shelters, towers, equipment and to ensure sufficient equipment, tower space, HVAC and power capacity to support the system.

MCP is currently supporting a similar engagement in Memphis, TN that included a review of ten tower sites which were interconnected by a microwave system that provided intercommunications and system management between the repeated radios at the tower and the dispatch consoles at the dispatch centers.

MCP leverages this experience on similar initiatives in addition to our proven methodology to ensure a comprehensive survey and recommendations for the City of Stockton.

**Deliverable(s):**
- Site surveys
- Recommendations for RF locations and sites

**Task 2: Capacity Analysis and Requirements**

**Radio Channels and Usage Statistics**

Radio spectrum is a critical component of any wireless system and is a limited resource, often influencing decisions regarding radio technologies because of the availability of suitable channels.

The number of channels available in the City’s system determines the system’s capacity. To determine the optimal number of radio channels required for the new trunked radio system, MCP will:

- Review current FCC licenses and spectrum used or licensed to City and/or its agencies
- Research additional spectrum availability in currently used and/or potential frequency bands
- Evaluate current system loading based on system usage statistics or alternative approach
- Evaluate loading based on user feedback regarding:
  - Current channel configuration
  - System usage statistics from the existing system to the extent possible
  - Industry standards that address the number of users on each channel

We understand the City is looking to migrate from a conventional to a trunked radio system architecture and wants to capture accurate system loading data to calculate the number of talkpaths necessary to meet the City’s capacity demands.

The use of industry standards for the average number of push-to-talks per hour and the average call duration is adequate for determining the initial number of talkpaths on a trunked system. Rarely do actual usage statistics vary to the extent that the number of required talkpaths is significantly altered.

MCP proposes to utilize an average of five push-to-talks per hours with an average duration of four seconds. The total number of active users on the system can be estimated by the total radio count (factoring in projected growth and interoperability users) divided by three.

The City’s requested scope to use equipment to monitor the current conventional channel usage is complex and time consuming. Separate equipment will be required for each channel at each radio site.
MCP is prepared to take this approach if the City wishes, but pricing for both options are provided in the Pricing section.

**Erlang C Traffic Calculations**

If the City wishes to proceed with collecting usage data, MCP will perform calculations in accordance with industry standards.

To establish the proper number of trunked channels needed for routine and emergency conditions, MCP will evaluate the potential impact of increased capacity using Erlang C calculations and will be based on the number of active system users during the busiest time of day.

This analysis will provide the information needed to make recommendations regarding the potential need for additional channels to support effective communications for the City’s users.

Prior to decisions being made, a radio spectrum review will be completed to ensure that sufficient channels exist to support upgrade or enhancement recommendations.

**Deliverable(s):**
- Letter report providing measurement findings and channel recommendations
- Alternatives and considerations regarding the most viable conventional and trunking systems

**Task 3: FCC Regulatory Efforts**

**Frequency Plan**

The City will be provided a network frequency plan at the conclusion of Task 3. The plan will:

- Determine which existing ultra-high frequencies (UHF) can be used for trunking
- Modify existing or apply for new FCC licenses

MCP’s FCC SME will assist with the tracking and status of all of FCC applications for the project to assist the appropriate City staff. MCP will:

- Assist in addressing and resolving licensing issues that arise
- Ensure the City has a plan for any needed channels to be licensed in a timely manner
- Review and update the frequency assignments to achieve the following
  - Ensure the assignments provide the greatest level of flexibility for potential applicants while ensuring judicious frequency reuse and minimizing the potential for interference
  - Establish procedure for securing channels above and beyond the initial frequency assignments

**FCC Applications**

All frequency coordination fees and FCC licensing fees (if any), are to be paid directly by the City. This plan will support the City in establishing the antenna system designs that will be needed by the vendor. The work will include the conventional backup frequencies and those for the new MUD site as well.
Our team brings extensive frequency planning experience to the City’s project, including the State of Montana, the Alamo Area Council of Governments, TX; Region 34, Oklahoma and various licensing efforts for counties in Pennsylvania, Montgomery, York, Berks, Bucks, Fayette County, KY, Gloucester County, NJ and Broward County, FL. We leverage this experience to ensure the City is fully prepared for the upgraded system.

Construction Extension Requests

MCP understands that FCC rules require that radio systems be constructed within 12 months of the license grant, but this is routinely extended several years by a formal written request. As the City must file annual milestone updates with the FCC until project completion, MCP will:

- Submit these requests on behalf of the City
- File these documents for Years 2 and 3 at no cost to the City

**Deliverable(s):**
- Frequency Plan
- FCC Applications
- Construction Extension Request

Task 4: Assist with Vendor Scope of Work and Proposal Review

Scope of Work Development

It is MCP’s understanding of the RFP that the City already has a radio vendor in place since the P25 core and consoles are in the final phase of implementation. Therefore, this scope of work (SOW) developed in this task will be for a sole source procurement, and not a competitive one.

MCP will:

- Assemble all system design details into a single concise implementation plan document
- Work from the approved design and understanding of:
  - Functionality
  - Performance
  - Reliability Requirements
- Develop specifications for the procurement of each of the identified major systems:
  - Microwave and T1 Backhaul System
  - Conventional Radio System
  - Trunked Radio Systems
  - Conventional Backup and Interop System
System Components

The functional and performance requirements documented in the specifications will be detailed sufficiently to emphasize that clearly and thoroughly presented requirements are to be met.

The procurement process is developed to support the flexibility to purchase, manage and install individual systems and components that complement each other, including, but not limited to:

<table>
<thead>
<tr>
<th>System RFP Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Repeaters and receiver systems</td>
</tr>
<tr>
<td>• Dispatch consoles/workstations (currently being implemented)</td>
</tr>
<tr>
<td>• Tower site selection</td>
</tr>
<tr>
<td>• Frequency plan</td>
</tr>
<tr>
<td>• Backup power</td>
</tr>
<tr>
<td>• Antenna systems</td>
</tr>
<tr>
<td>• Acceptance testing methodology</td>
</tr>
</tbody>
</table>

This approach enables the vendor to propose commercially viable solutions with less cost and risk, as long as the specified requirements are met.

SOW Response Evaluation Support

Once the SOW is released by the City procurement staff to the vendor, MCP will support the evaluation and contract negotiation process including:

- Detailed proposal review meetings with City staff
- Contract negotiation planning meeting
- Participation in contract negotiation meetings with the vendor

Additional consideration to define this phase will be required once the proposal is reviewed. MCP will:

- Manage vendor communications
- Specifically address the proposal’s ability to meet user requirements

Vendor Contract Negotiation Support

MCP will:

- Work with the vendor and City to establish a final vendor quote
- Attain a final detailed price proposal from the vendor to complete the project
- Validate the City’s total cost of ownership analysis
While the SOW document will provide a high-level design framework, the vendor would be responsible for selecting the specific parts and manufacturers and perform the final detailed design. MCP will help provide technical direction and oversight and, upon award notification, MCP will support:

- Final negotiations
- Contract execution

MCP uses its database of nationwide pricing to negotiate with vendors to achieve a system design that fulfills the City’s performance requirements, with the assurance of the most competitive pricing. Our methodology ensures the City knows the system is not being overengineered and not being overcharged. MCP has helped clients:

- Lower system maintenance costs by upwards of 20 percent
- Negotiate savings typically ranging from 25 to 40 percent during the procurement stage

Once final negotiations are completed, MCP will assist via teleconference in presenting the final results to the system stakeholders if requested by the City.

**Deliverable(s):**

- Create the scope of work document for the system implementation and other supporting documents as needed to complete the implementation
- Validate the City of Stockton’s total cost of ownership analysis
Project Team
With more than 135 staff members, MCP’s specialized professionals are integral members of our team:

<table>
<thead>
<tr>
<th>MCP’s Specialized Professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Former public safety managers</td>
</tr>
<tr>
<td>• Project Management Professionals</td>
</tr>
<tr>
<td>• Emergency Number Professionals</td>
</tr>
<tr>
<td>• Technology, forensic, and policy specialists</td>
</tr>
<tr>
<td>• FCC licensing and regulatory experts</td>
</tr>
</tbody>
</table>

MCP will support this project with 100 percent internal staff to protect the City from the risk of 1099 staff or subcontractors that could delay project initiation, delivery or create contractual issues over responsibilities.

MCP has identified below the key team members we plan to assign to this important project.

Organizational Chart

**Figure 1: Project Team**
Each team member brings a unique skill set and depth of experience in radio infrastructure upgrades, in particular, but additional resources and SMEs are available also—as we a full-service firm focused on all aspects of public safety communications.

Certifications and Experience

Professional certifications are critical to a project of this nature to ensure industry standards and knowledge are applied to your solution. Our experience is included in the following table:

<table>
<thead>
<tr>
<th>Name</th>
<th>PMP</th>
<th>ENP</th>
<th>PE</th>
<th>NENA Members</th>
<th>APCO(^1) Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scott Neal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darek Wieczorek</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craig Stevens</td>
<td>✓</td>
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<td></td>
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<tr>
<td>Peter Hambuch</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nick Falgiatore</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Todd Johnson</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To support the City, MCP has selected a team with certifications highlighting industry recognition of our public safety leadership and knowledge appropriate for this project. This includes Todd Johnson, a California resident and licensed California professional engineer.

\(^1\) Association of Public-Safety Communications Officials
Past Public Safety Roles

MCP will advocate for the City because our team includes staff that have been in your seat as highlighted by our teams past public safety roles in Table 2.

Table 2: Proposed Project Team Past Experience

<table>
<thead>
<tr>
<th>Staff</th>
<th>Sample Past Position Experience</th>
</tr>
</thead>
</table>
| Scott Neal       | • Pennsylvania State Police  
                    - Major, Director of the Bureau of Communications and Information Services  
                    - Responsible for the operation and maintenance of the Pennsylvania Statewide Radio Network (PA-STARNET)  
                    - Responsible for the administration of the Commonwealth Law Enforcement Assistance Network (CLEAN), a platform that enables all law enforcement agencies in Pennsylvania to access the Federal Bureau of Investigation’s National Crime Information Center (NCIC) databases, driver’s license and registration databases, and other relevant information |
| Craig Stevens    | • National Security Agency  
                    - Program Manager |
| Todd Johnson     | • City of Houston, TX  
                    - Assistant Director |

Our solution does not only include our professional consulting experience, but we leverage our firsthand experience because we have been on a traffic stop in the middle of the night, behind the console, on a fire scene, and across the table from vendors during design sessions and negotiations. We understand the importance of this project to the City’s first responders and citizens.

Resumes

Resumes highlighting our qualifications and experience are included on the following pages.
Scott brings three decades of emergency communications experience to MCP. Scott retired in 2015 after completing a 28-year career with the Pennsylvania State Police (PSP). At the time of his retirement, he held the rank of Major and was the Director of the Bureau of Communications and Information Services, responsible for the operation and maintenance of the Pennsylvania Statewide Radio Network (PA-STARNET). He also was responsible for the administration of the Commonwealth Law Enforcement Assistance Network (CLEAN), a platform that enables all law enforcement agencies in Pennsylvania to access the Federal Bureau of Investigation’s National Crime Information Center (NCIC) databases, driver’s license and registration databases, and other relevant information. Scott also served as the single point of contact for the Commonwealth of Pennsylvania for the planning efforts of the nationwide public safety broadband network (NPSBN) from 2012 – 2015. He specializes in communication and information services.

Representative Experience

Radio Upgrades
- Memphis/Shelby County, TN—Radio system assessment and RFP development
- Northumberland County, PA—Radio system upgrade
  Oversee the implementation of a county wide P25, trunked VHF radio network
- Gallatin County, MT—Radio system upgrade support
- Arizona FirstNet Consulting Services
  Data collection/analysis, education and outreach, and conducting band 14 technology exercise for the planning of the NPSBN
  Project manager for the development and delivery of an RFP to explore potential public private partnerships in a FirstNet “opt-out” scenario
- New Hampshire—Radio System assessment, upgrade, and RFP development
- Arizona—Statewide broadband strategic planning, microwave network planning and design; Statewide Radio Request for Information
- Arizona Northern Microwave Loop Upgrade

FirstNet Experience
- Nationwide Public Safety Broadband Network Planning (NPSBN), Project Lead
  Arizona  Missouri  New Jersey
  Michigan  New Hampshire  Pennsylvania

Additional Experience
- Responsible for operation and maintenance of Pennsylvania Statewide Radio Network (PA-STARNET), digital trunked 800 MHz public safety radio system operating on the OpenSky platform on 1,100 radio sites
- Led the planning effort to transition the PA-STARNET from current platform to a hybrid VHF/800 MHz P25 phase II
- Designated single point of contact by the Pennsylvania governor for the planning efforts of FirstNet from its inception
- Led the effort to procure and deploy the first ever department wide records management system for PSP.
John Michael “Mike” Lyons
Vice President of Business Development, Mission Critical Partners

Mike is a values-based leader with a long-standing appreciation for creating strong teams, built on the foundation of organizational learning and personal accountability. Over Mike’s career, he has developed a strong appreciation for collaboration, alignment, and clarity in his leadership and management approach. Mike’s natural inclinations relate well to organizations that align themselves with a client intimate style where his commitment to service and learning are put to best use. Through the course of his career, Mike has proven to be a capable leader and manager that can align and motivate stakeholders throughout the business process, from investors to employees and clients. Operationally, Mike has a high degree of competency in running businesses from manufacturing to software development and consulting.

**Representative Experience**
- Leadership and business development role of a public safety focused managed services company—managing day to day operations, sales and business relationships with business partners
- Drive business development efforts to build sales and revenues
- Manage company resources and direct projects delivery
- Manage company finances, revenues, and profitability
- Leadership role directing and leading the start-up efforts of a provider that focused on developing training and tools specifically designed to improve local-manager effectiveness
  - Product development and client relations efforts
  - Business development and relationship management
  - Developed and managed pilot projects
  - Day to day management of company operations
- Employee engagement consultant focused on helping companies build strong, resilient organizations. The practice encourages leaders, managers, and employees in key principles of effective relationships built on integrity and trust, ownership thinking and innovative collaboration techniques.
  - Created a training curriculum and materials for classes
  - Delivered training
- Participated as a senior level manager to set and execute corporate success strategies
- Effectively managed and transitioned the leadership of a highly skilled and diligent team of professionals to an internally groomed successor
- Served and developed through conscious leadership and management a dedicated team of 100+ employees in support of public safety clients across the United States
- Strategically placed and replaced employees into positions of success to transition what was a company of traditionally poor performance and losses to one that was consistently profitable
- Consistently communicated with employees, investors, and partners to create an environment of trust, collaboration, and success
- Effectively escalated customer satisfaction ratings from all-time lows to all-time highs
- Effectually engaged employees to create a respected team and an organization characterized by a commitment to service and excellence
- The trained and mentored staff as they adopted improved business process
- Worked diligently to create an environment that encouraged employee engagement and ownership thinking
- Fostered open communication within client services to improve business processes and create increased client satisfaction ratings

**Industry Experience**
23 years

**Education**
Business Administration, University of Phoenix
Business, Orange Coast College

**Certifications**
Rockefeller Habits Trainer
Human Capital Coach
Integrative Mastery Coach

**Associations**
iCERT Board of Directors 2012 – 2013
IJIS Institute President 2009 – 2011
IJIS Institute Board of Directors 2006 - 2011
Darek Wieczorek, PMP
Project Manager/Senior Consultant, Mission Critical Partners

Darek is a consultant who brings extensive public safety and telecommunications experience that includes the management, support, and implementation of radio and wireless projects throughout North America and Europe. His expertise covers all aspects associated with public safety communications systems projects from user needs and customer requirements, design and management to procurement and implementation support.

**Representative Experience**

Radio Upgrade, Project Manager
- **State of Arizona Projects**
  - Crossman Peak Radio Engineering Support
  - Statewide Microwave Network Plan
  - Microwave Assessment and Design
  - Network Sharing Technology Roadmap
  - Land Mobile Radio RFI
  - P25 Radio Procurement
  - Southwest Loop NEC Installation and Digital Migration
- **California State University**— Radio Assessment
- **QUADCOM, IL**—Radio Communications Systems
- **City of Los Angeles, CA**—Radio Site Application
- **Colusa County, CA**—Radio Tower Construction

Additional Radio Upgrade Experience
- **Massachusetts**—P25 LMR Engineering Design
- **Arizona**—FirstNet Consulting
- **Perry County, PA**—Radio Communications System Consulting
- **State of NJ and AZ**—First Responder Network Authority (FirstNet), assisting in the evaluation of proposals and educational outreach programs
- **Tennessee Emergency Communications Board**—Statewide radio inventory project
- **Central TX Council of Governments**—Radio interoperability report

Project Management, Needs Analysis, Preliminary System Design, RFP, Vendor Selection, and Contract Negotiations Support
- **City of Lexington, KY**
- **City of Cleveland, OH**
- **Warren County, OH**
- **Wood County, OH**
- **Drake County, OH**
- **Clinton County, OH**

Additional Experience
- Managed several large and medium-size urban system implementations
- Consulted on the design of wireless communication systems including customer requirements analysis, proposal approvals, coverage prediction, design and verification
- Supervised a Project Management team delivering radio communications projects for public safety and utilities ranging from a single site to 120 plus radio sites
- Developed capacity-engineering calculator for new trunked wireless system
- Managed a vendor program delivering post-implementation system support services to 30 plus wireless systems

**Industry Experience**
34 years

**Education**
- Master of Business Administration, Duke University, Fuqua School of Business, North Carolina
- Master of Science (MSCEE), Electrical Engineering (Radio Communications), Merchant Marine Academy, Poland

**Certifications**
- Project Management Professional (PMP)

**Associations**
- Project Management Institute (PMI)
Craig F. Stevens, PMP
Project Manager, Mission Critical Partners

Craig is an accomplished technical engineering management professional with extensive experience in telecommunications and government industries. His possesses a diverse management experience including engineering design activities, projects, personnel, vendor relationships, and end users. Craig is a highly organized individual with a focus on customer service, leadership, attention to detail, excellent analytical problem-solving and interpersonal skills. He has collaborated with individuals both technical and non-technical in nature at engineering, front-line, and executive management levels.

Craig’s strengths are attention to detail, building team relationships, and continually identifying ways of improvement, he enjoys solving technical problems. His other skills include:

- Telecommunications
- Network Planning
- Pathloss 5.0
- Microwave RF Engineering
- MapInfo
- Optical Transport
- Granite/Xpercom
- 4G, LTE, VoLTE, CRAN
- Dashboard Metrics
- Financial Reporting
- Team Building
- Network Engineering Design

Representative Experience

Telecommunications Engineer
- Developed and evaluated engineering requirements for various types of telecommunications and related protection and controls equipment
  - Evaluated current telecommunication assets such as SONET devices, existing copper and fiber infrastructure, wireless network devices, SCADA systems, and land mobile radio for developing a five-year forecast for maintenance and programmatic upgrades of various pieces of equipment
  - Developed a business plan and business cases to secure funding for inspection, maintenance, and capital replacement programs, managing the budget of each program year to year

Principal Engineer
- Dimensioned IP Multimedia System (IMS)/Universal Services Platform (USP)
  - Supporting the physical Voice over LTE (VoLTE) network elements to meet customer demand of over 89 million subscribers
  - Collaborated with engineering, planning, labs, and marketing to develop system roadmaps for migration of legacy physical hardware network elements to virtualized elements
  - Created monthly network demand forecast presentations to detail capacity utilization trends
  - Triggered just-in-time capacity augment projects to new virtualized network platforms

Planning Engineer
- Presided as team leader working collaboratively across diverse teams to manage LTE transport design solutions for >1500 cell sites annually with >98% success rate
- Identified and implemented several microwave (MW) lifecycle schedule reduction opportunities to reduce overall schedule by 21 percent
- Reviewed network transport equipment installation data against expected performance
Peter A. Hambuch
Senior Technology Specialist, Mission Critical Partners

Peter is a California resident that possess customer-centered consulting, engineering and technical architecture skills. His career has focused on the public safety industry, law enforcement, fire and public service at the city, county and state levels. His public safety wireless technologies experience includes 700MHz wireless broadband data, FirstNet, LTE, secure and scalable wireless land mobile radio systems, Project 25, simulcast, and digital and analog. Peter also has project management experience in the wireless industry, supporting clients on mission critical networks to ensure safety and interoperability.

Representative Experience
Radio Upgrade Experience
- California State University— Radio Assessment
- State of Arizona Projects
  - Microwave Assessment and Design
  - P25 Radio Procurement
  - Southwest Loop NEC Installation and Digital Migration
- QUADCOM, IL—Radio Communications Systems
- Iredell County, NC— Emergency Communications Center Consulting
- Kane County, IL—Radio System Assessment/Microwave
- Massachusetts—P25 LMR Engineering Design
- Colusa County, CA—Radio Tower Construction
- Cincinnati, OH — Radio microwave support

Additional Experience
- Sales Engineer
  - Provided support with industry leading software solutions for mission critical and business critical applications
- Senior Solutions Architect
  - Proficient in land mobile radio
  - Created dependable communications roadmaps for public safety networks
  - Develop P25 migrations for analog customers
  - Developed request for proposals
  - Focused on traditional and non-traditional two-way systems:
    - Radio frequency identification (RFID)
    - Video
    - Handheld computers
    - Wireless local area network (WLAN) in vehicles

Industry Experience
25 years

Education
Electrical Engineering
Milwaukee School of Engineering

Associations
Association of Public Safety Communications Officials (APCO)

Land Mobile Radio Network
Nicholas Falgiatore, PE, ENP
Senior Technology Specialist, Mission Critical Partners

Nick is a radio and wireless specialist who has served more than 50 public safety clients ranging in size from small municipalities to state agencies. His experience encompasses all aspects associated with public safety communications systems implementation, including needs assessment studies, system procurements, and system implementation engineering support. Nick manages county and statewide projects and has supported P25 Phase I and Phase II system implementations from multiple equipment vendors. He is actively supporting numerous states through the State and Local Implementation Grant Program grant as they work toward FirstNet’s buildout of the nationwide public safety broadband network. His expertise includes radio systems design, system acceptance testing, FCC licensing, propagation modeling, interoperability planning, data gathering, 800 MHz rebanding, P25 subscriber certification, coverage testing, and site assessments.

Representative Experience

Frequency/FCC Experience
- State of Montana – VHF Frequency Plan Development for Interoperability Montana system
- Alamo Area Council of Governments – Support for the development of the Region 53 (southern Texas) 700 MHz Regional Plan
- Region 34 (Oklahoma) – Support for the development of the Region 34 700 MHz Regional Plan
- Various 700/800 MHz licensing efforts for Regional Planning Committees – Montgomery County PA, York County PA, Gloucester County NJ, Broward County FL, Berks County PA, Bucks County PA, Fayette County KY

Radio Upgrade Experience
- Broward County, FL—Radio system needs assessment, procurement, implementation, and deployment
- Okaloosa County, FL—Radio system analysis
- Tarrant County, TX—Radio system interoperability assessment and procurement
- Lawrence County, PA—Radio system needs assessment, FCC licensing procurement, and implementation P25 Phase II system
- Montgomery County, PA—Radio system needs assessment, procurement
- Butler County, PA—Radio system needs assessment and procurement
- Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA)—Chemical Stockpile Emergency Preparedness Program (CSEPP)
  - Radio systems needs assessments and coverage modeling
- Missouri—Statewide P25 VHF trunking system implementation, FirstNet support in data collection, outreach and education, consultation, and SCIP update
- Michigan—National public safety broadband network (NPSBN) planning activities

Additional Experience
- Southeast Pennsylvania Regional Task Force (SEPARTF)—Regional Inter-RF Sub-System Interface (ISSI) and interoperability assessment
- Northern Virginia Emergency Response System (National Capital Region)—ISSI assessment

Industry Experience
12 years

Education
- M.S., Electrical Engineering, University of Central Florida, Florida
- B.S., Electrical Engineering, University of Central Florida, Florida

Licenses/Certifications
- Professional Engineer (PE), Florida, Tennessee, North Carolina
- Emergency Number Professional (ENP)

Associations
- National Emergency Number Association (NENA)
- Association of Public Safety Communications Officials (APCO)

Awards
- Named to the 2017 IWCE Young Professionals Awards list, which showcases the next-generation of leaders in the communications technology industry who are shaping the future of the industry
Todd B. Johnson, PE  
Senior Technology Specialist, Mission Critical Partners

Todd is a licensed California Professional Engineer and brings years of experience in public safety wireless communications. Todd has been responsible for supporting clients through the assessment of their needs to design and installation of customized systems and has provided team leadership managing multiple teams to ensure the success of projects and services for clients and as a customer.

Representative Experience

Radio Upgrade Experience
- Broward County, FL—Technical support for assessment and planning for implementation for P25 trunked radio system
- City of Memphis and Shelby County, TN—Public safety radio system procurement and implementation.
- City of Philadelphia—Review 7.18 upgrade plan and participate in the public safety communications strategy
- Horry County, SC—Radio and paging system replacement
- Pasquotank County, NC—Radio dispatch backup center
- Gallatin County, MT—RF consulting and engineering support on a dual band trunking system
- Great Falls, MT—Public Safety Radio System
- Story County, IA—Engineering lead on the assessment and selection of vendor. Reviewed the radio system, microwave, consoles, push to talk, and interoperability segments of the county’s selection.
- Fayette County, GA—Engineering lead on the assessment and selection of vendor. Reviewed the radio system, microwave, consoles, push to talk, and interoperability segments of the county’s selection.
- Wake County, NC—Radio system replacement and push to talk (PTT) over cellular
- Wayne County, PA—Technical support for broadband network implementation
- Missouri—Statewide P25 VHF trunking system site expansion, coverage modeling, and vendor management for maintenance activities

Additional Experience
- City of Houston, TX—Assistant Director
  Managed a P25 radio system for Police, Fire, EMS, and Public Works, transitioned public safety personnel from conventional analog to Digital P25 Phase 2, developed the roadmap for a regional radio system, converted Public Works from traditional LMR to ESChat’s push to talk over cellular
- Utility Team Leader for Motorola
  Reliant Energy (Centerpoint) – Replacement dispatch center
  Entex Gas (Centerpoint Gas) – Data Solution
  Cleco – Statewide utility in Louisiana – Statewide trunking and data solution
  Progressive Energy – Multi-statewide trunking and data solution
  Entergy – Multi-State multizone trunking solution
  FPL – State wide Trunking system
  San Antonio Water System – City wide radio system (they have since migrated to iDEN)
  Austin Electric – City wide radio system (they have since migrated to GATTTRs)

Industry Experience
32 years

Education
MBA, Business Administration, Louisiana State University

B.S., Electrical Engineering, University of Houston, Texas

Licenses/Certifications
Professional Engineer (PE), California, Texas, Georgia and Iowa

Amateur Radio Operator KG5HNJ
Scott E. Johnson  
Technology Specialist, Mission Critical Partners

Scott is experienced in managing and executing all phases of new and/or replacement two-way radio systems. He assists clients in the area of mobile voice and data radio communications systems. Services include needs assessment, system design, FCC licensing, development of system specifications proposal evaluation, implementation assistance and acceptance testing, as well as interoperability assistance.

Representative Experience
Radio Upgrade Experience

- Maricopa County, AZ
  Responsible for all facets of the radio system replacement project including FCC frequency license applications, technical documents review, construction activities oversight, coordination of activities between various organizations, conflict resolution, factory and post installation radio and microwave system functional testing, radio coverage testing, system open items closure, system burn-in, system turnover and project lessons learned/project closure.

- CenterPoint Energy, Houston, TX
  Conducted next generation voice/data radio study and assisted with vendor negotiations and system implementation/testing for an OpenSky radio system.

- South Texas Project, Bay City, TX
  Narrowbanded three wireless systems, the paging, emergency siren and two-way radio systems, as well as modified backup radio system for improved outdoor coverage at nuclear plant.

- Oncor, Dallas, TX
  Support all wireless/mobility needs of the corporate enterprise, including a 896 MHz EDACS radio system with 112 towers covering 90,000 square miles, with 4,000 corporate users and 1,000 external users.

- East Texas Council of Governments
  Coordinated logistics and served as controller for 14 county tabletop and full-scale exercise.

- Omaha Public Power District, Omaha, NE
  Conducted interviews, developed and presented PowerPoint report with technical recommendations and budgetary estimates for new utility radio system. Developed RFP for new utility radio system and made recommendation based on vendor proposals.

- Oklahoma City, OK
  Public safety EDACS radio system design approval, implementation, and functional and coverage testing.

- Central Planning Area
  Coordinated logistics and served as controller coordinator for seven county California SIEC interoperability communications tabletop and field exercise.

- South Texas Development Council
  Conducted interviews, gathered information, and authored Regional Interoperability Communications Plan for a four-county area adjacent to Mexico.

Industry Experience
39 years

Education
B.S., Electrical Engineering, Tulane University, LA

Certifications
Enhanced Digital Access Communication System (EDACS), Two-way Radio System Maintenance Certification

ICS Certifications:
IS-00100.a, IS-00120.a  
IS-00130, IS-00139 and IS-00700.a

Associations
EDACS Utility Trunked Radio Users Group  
Project Management Institute (PMI)
Experience
Public Safety Experience

Mission Critical Partners is in its eleventh year of providing public safety consulting services to help our clients enhance and evolve their mission-critical systems and operations. Our footprint includes more than 1,285 projects, many of which include radio infrastructure replacements.

A description of MCP’s services offered across the entire public safety communications continuum is provided in Appendix A.

California Experience

MCP has supported more than 84 projects in California and brings a strong understanding of California’s local and state regulations, standards and procedures that will be an important component of this project.

<table>
<thead>
<tr>
<th>Sample California Projects</th>
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</thead>
<tbody>
<tr>
<td>Alameda Police Department, City of</td>
<td>Newark, City of</td>
</tr>
<tr>
<td>Beverly Hills, City of</td>
<td>North County</td>
</tr>
<tr>
<td>California 9-1-1 Emergency Communications Branch</td>
<td>Malibu, City of</td>
</tr>
<tr>
<td>California State University — Fullerton</td>
<td>Orange County</td>
</tr>
</tbody>
</table>
### Sample California Projects

<table>
<thead>
<tr>
<th>California State University — Los Angeles</th>
<th>Oxnard, City of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colusa County</td>
<td>Mountain View, City of</td>
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<td>Contra Costa County</td>
<td>Paso Robles, City of</td>
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<tr>
<td>Emeryville, City of</td>
<td>Sacramento, City of</td>
</tr>
<tr>
<td>Hawthorne, City of</td>
<td>Sacramento Regional Fire/EMS</td>
</tr>
<tr>
<td>Humboldt County</td>
<td>San Bernardino Council of Governments</td>
</tr>
<tr>
<td>Imperial Valley Emergency Communications Authority</td>
<td>San Diego County</td>
</tr>
<tr>
<td>La Mesa, City of</td>
<td>San Jose, City of</td>
</tr>
<tr>
<td>Los Angeles, City of</td>
<td>San Francisco, City and County of</td>
</tr>
<tr>
<td>Los Angeles, County of</td>
<td>San Mateo County</td>
</tr>
<tr>
<td>Madera County</td>
<td>Santa Cruz, City of</td>
</tr>
<tr>
<td>Milpitas, City of</td>
<td>Stockton, City of</td>
</tr>
<tr>
<td>Monterey County</td>
<td>Yolo County</td>
</tr>
</tbody>
</table>

MCP leverages this full range of public safety and California project experience while developing our solution for the City and throughout the course of the project to ensure a solution that addressed current and future needs, local, state and federal requirements and all appropriate standards.

Radio and Wireless Experience

MCP’s proven record of success with radio infrastructure projects is detailed on the following pages.
Table 3: Sample Radio/Wireless Projects

<table>
<thead>
<tr>
<th>Client</th>
<th>Assessment</th>
<th>Procurement</th>
<th>Implementation</th>
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</thead>
<tbody>
<tr>
<td>Arizona, State of</td>
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<td>Armstrong County, PA</td>
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<td>Broward County, FL</td>
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<td>Butler County, PA</td>
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<tr>
<td>California State University – Los Angeles</td>
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<tr>
<td>Cambria County, PA</td>
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<td>Centre County, PA</td>
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<td>✓</td>
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<tr>
<td>Confederated Tribes of Umatilla Indian Reservation</td>
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<tr>
<td>Cumberland County, PA</td>
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<td></td>
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<tr>
<td>City of Denton, TX</td>
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</tr>
<tr>
<td>Department of Homeland Security/Chemical Stockpile Emergency Preparedness Program</td>
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<tr>
<td>Fayette County, GA</td>
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<td>FirstEnergy</td>
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<td>Frederick County, VA</td>
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<td>Fulton County, PA</td>
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<tr>
<td>Gallatin County, MT</td>
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<td>Gloucester County, NJ</td>
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<td>Great Falls, MT</td>
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<td>Highland Village, TX</td>
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<td>Horry County, SC</td>
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<tr>
<td>Huntingdon County, PA</td>
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<tr>
<td>Client</td>
<td>Assessment</td>
<td>Procurement</td>
<td>Implementation</td>
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<td>Jim Wells County, TX</td>
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<td>Kane County, IL</td>
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<tr>
<td>Kansas, State of</td>
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<tr>
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Customer References

Pueblo County, Colorado
Federal Emergency Management Agency (FEMA)/
Chemical Emergency Stockpile Emergency Preparedness Program (CSEPP)

Service Provided: Radio System Upgrade

Contact: Mark Mears, Emergency Services Bureau Chief, 719.583.6201,
Mears@co.pueblo.co.us

Project Dates: May 2012 to August 2015

Challenge: Pueblo County (County) requested assistance from the Federal Emergency Management Agency (FEMA) through the Chemical Emergency Stockpile Emergency Preparedness Program (CSEPP) to upgrade their radio system to address the following challenges as it neared its capacity:

- Equipment was at end-of-life and was no longer supported by the manufacturer
- Relied on a network connection to the Denver zone controller over 100 miles away via the longest and oldest microwave connection in the network
- Single point of failure system, leaving the County with no mission critical communications on multiple occasions

Solution: Mission Critical Partners served as the technical lead for the project, providing oversight of the design process, as well as the procurement and installation of the radio system. Specific tasks performed by MCP included:

- Documentation of technical requirements
- Development of system design options for consideration
- Preparation of detailed procurement specifications
- Installation oversight, project management and technical support
- Implementation and cutover
- Testing and acceptance

MCP worked closely with stakeholders to ensure the new system would meet their needs and expectations and supplied direct project support to the County for all facets of the implementation project. Users transitioned to the new system after successful coverage testing and validation.

Key Result: MCP gathered information to prepare detailed system requirements, design, budget and a statement of work. The Motorola 800 MHz P25 phase 1 system design significantly improved County communications and:

- Enabled the County to remain on the statewide digital trunked radio system
- Created a local system the County can still operate on if connectivity to the rest of the state is compromised
- Provided a very high degree of reliable/redundant communications
- Allowed the local 'core' to act as a stand-alone radio network and eliminated the dependency on the microwave links to the state ‘core’ in Denver

Additional capacity was added to provide seamless interoperability and cross-discipline communications. The system can support the movement of large groups of people via evacuation routes and those gathered in single locations such as shelters, in case of a chemical incident. The system also provided expanded coverage in key populated areas.
Commonwealth of Massachusetts

**Service Provided:** P25 Land Mobile Radio Engineering Design Services for the Commonwealth of Massachusetts Interoperable Radio System Network

**Contact:** Scott Bailey, Project Manager – Interoperable Communications Bureau; scott.bailey@state.ma.us; 617.875.0856

**Project Dates:** March 2018 to Present

**Challenge:** The Commonwealth of Massachusetts (Commonwealth) Interoperable Radio System (CoMIRS) is a statewide radio system providing operable and interoperable communications for 245 public safety, transportation and environmental agencies. Of the 30,000 active radios, 18,856 are for operable or mission-critical daily communications use.

The Executive Office of Public Safety and Security (EOPSS), on behalf of the State 911 Department, the PSAPs and other user agencies of the state’s network, sought a professional consulting firm to address the current and future users of the CoMIRS radio network and to take into consideration:

- Existing coverage gapes
- Planning for expanded capacity use without affecting service or audio quality
- Improve coordination with E911 PSAPs
- Maximizing radio coverage and capacity for emergency and 911 response

**Solution:** MCP was retained to provide support the design for a P25 compliant statewide digital radio network, before initiating at actual build-out of the radio network. This support includes the completion of the following tasks:

- Reviewed current simulcast regions and planning for smaller simulcast regions
  - Stakeholder operation areas and alignment of simulcast region boundaries
  - E911 reporting, response areas and simulcast region alignment
  - RF site identification and model broadcast ranges to accommodate user operational areas
  - Reviewed existing coverage maps
  - Facilitated delivered audio quality (DAQ), grade of services (GoS) and coverage decisions
  - Provided recommendations on site placement to accomplish goals
- Conducted site visits/assessments and documented existing equipment at each site
  - Assessed radio site capacity and documented deficiencies
  - Initiated radio frequency new site acquisition
- Finalized backhaul design key tasks
- Revised P25 channel plan and assessed available frequency
- Provided detailed implementation plan, priorities and immediate needs

**Key Result:** Technical evaluations were needed to assess and plan for each radio site that will constitute the radio network. MCP provided the Commonwealth with final reports highlighting:

- Coverage details
- Planned site comparisons
- Site requirements
- Conceptual planning
- Paging reporting
- Recommended simulcast areas

MCP is currently supporting the review and finalization of the assumptions and plans for the network.
City of Memphis and Shelby County, Tennessee

Service Provided: Radio System Upgrade

Contact: Jim Harvey, Consultant/Technology Manager, Memphis Police Department, 901.636.3700, Jim.Harvey@memphistn.gov

Contact: Wink Downen, Chief Inspector/Information Systems, Shelby County Sheriff’s Office, 901.222.5508, wink.downen@shelby-sheriff.org

Project Dates: January 2015 to Present

Challenge: The City of Memphis and Shelby County Tennessee Government (County) jointly owned and operated an 800 MHz Motorola SmartZone 4.1 system with two 7-site Simulcast systems and one 5-channel IR (Intellirepeater) site. The County wished to upgrade to an Association of Public-Safety Communications Officials (APCO) P25 Phase 2 radio system. The upgrade or replacement needed to:

- Reuse any current towers or equipment possible to maximize economies to the owners
- Maximize the benefit to the users and provide growth for future use and enhancements to coverage

Solution: Mission Critical Partners was retained to support the radio system upgrade project. The system has a wide range of public safety and public service user groups with a wide range of operational and communications requirements needed to carry out their missions. MCP’s approach to the overall project is broken down into phases outlined below:

- Needs assessment and development of recommendations
  - Conducted interviews with the system users to listen to the user groups
  - Identified and understand the ongoing needs of each user department.
  - Completed a comprehensive needs analysis report
- Procurement support
  - Supported the release of a radio system upgrade RFP
  - Evaluated proposals and a preferred vendor was selected
- Implementation and project management
  - The system is currently being implemented and is in the design phases

Key Result: Mission Critical Partners has provided Memphis/Shelby County with:

- Comprehensive needs assessment report
- Released a RFP and received vendor proposals to procure the desired APCO P25 Phase 2 radio system upgrade
- Reviewed proposals and support vendor selection
- Provided additional procurement support for the new radio system

MCP has been contracted to assist the City of Memphis and Shelby County in the implementation phase of the radio system replacement project and is anticipated to be completed by the end of calendar year 2020.
Pricing
Professional services outlined in the scope of work utilizing the approach of placing equipment on the current system to collect call data will be provided for a fixed fee of $188,896, including expenses.

Alternatively, if the City selects using the approach of calculating system loading via industry standards, services will be provided for a firm fixed fee of $149,610.

The fee is fully loaded, and MCP recognizes that it is responsible for costs related to travel, housing, transportation, per diems, communications devices, and computer equipment. Any additional services contracted in subsequent years will be performed at MCP’s then current fee schedule. Prior to initiating any such additional work, MCP would require a formal letter of authorization from the City of Stockton.

An invoice shall be submitted each month and include the percentage of work completed relevant to the fee and shall be reviewed and paid within 30 days of receipt.

Please know, above all else, MCP is flexible and agreeable to negotiate any pricing established herein as our current understanding of the effort may not be yours. Our priority is for this project to be successful and we stand ready to adjust our level of support as deemed necessary for success to occur.
Appendix A: MCP’s Additional Services

Radio Wireless Services

Our radio/wireless experts bring an average of 25 years of experience to every project and have supported large municipal radio system implementations in ten of the top Metropolitan Statistical Areas. One hundred percent of our experts have hands-on experience using two-way radios. MCP’s leadership and support for your project means that your new system will boost coverage and capacity, exceed the needs of the user community and create maximum value.

Our team approaches your project with only one task in mind—helping you achieve your goals. This is accomplished through our unique approach that determines your operational requirements and designs a radio network around your needs and budget. Many agencies face constraints because of the design and operation of their radio network. The network should serve public safety users, as well as be another tool to keep our emergency responders and communities safe. The protection of life and property begins with a single dispatch. From there, the radio system is the link that connects and delivers your response and services to your citizens. It is far too important to trust to anyone other than your partner, your advocate, and your agent for innovative solutions—because the mission matters.

Our professionals work tirelessly to provide the necessary guidance for our clients to evolve to a radio/wireless communications system that is capable, reliable and affordable—and custom-designed for their needs and budgets. Offerings include, but are not limited to, operational and technical assessments, procurement support, FCC licensing, performance acceptance testing and FirstNet/NPSBN support.
Executive Consulting Services

MCP partners with clients to develop customized technical and operational solutions for public safety communications—**because the mission matters.**

Our staff has extensive experience serving in public-sector and public-safety management roles. We draw on our real-world experience when advocating for our clients. Through first-hand experience, we have earned a reputation for being accountable, prudent, persistent, progressive and reliable problem solvers and innovators.

We provide services that are initiated at a strategic level. An integral part of our executive-level consulting is providing master planning services. Our team of policy specialists collaborates with clients to create comprehensive plans that help direct decision-making in the public-safety sector. When developing a strategic plan, MCP incorporates master planning, organizational structuring, hiring assistance and fiscal planning, as well as operations and technology and policy solutions.

We first seek to gather insights into our client’s unique organization. We then meld these insights with our deep industry experience to formulate a strategy designed to serve as a guide to our client’s future. We focus on combining a comprehensive yet tactical approach that addresses every element of the client’s sphere of influence. Our team directs its collective energy on understanding the full scope of the client’s responsibilities and objectives. We uncover the unique challenges that stand in the way of achieving success. Our goal is to mitigate those challenges by leveraging policy, technology, fiscal and human assets to develop a sustainable solution.

Our clients are responsible for delivering reliable service 24 hours a day, seven days a week to emergency responders and the public while operating with limited resources. In recognition of the need to achieve more with less, we aim to put the client in a position to do more with more. This means structuring organizations, programs and projects for available grant funding through policy development, technology evolution and appropriate fiscal planning.
Network 911 Services

Our professionals have extensive experience with planning, designing, procuring, negotiating and implementing all Next Generation 911 (NG911) call delivery and processing elements. The public safety answering point (PSAP) environment continually will evolve with new technologies, processes and expectations. MCP’s goal is to help our clients implement resilient, effective and future-focused solutions that enhance emergency response and result in better outcomes for public safety—because the mission matters.

The MCP approach considers funding models, system lifecycle analysis, objectives, incident processing, network resources and governance opportunities to establish a thorough understanding of a client’s unique PSAP environment.

Our NG911 experts have extensive experience with incident processing in the PSAP, as well as incident dispatch and data management. MCP can develop a comprehensive master plan for the agency or region and a conceptual design for NG911 deployment. The master plan assesses all options and ensures timely deployment by incrementally upgrading technology and recommending policy, funding and governance modifications. Our offerings include but are not limited to, master planning and design and procurement support for a wide variety of communications networks, including IP-based networks, such as Emergency Services IP Networks (ESInets).
When everything you do is considered mission-critical, you require reliable systems to meet the demands of your always-on operation. Our planning, designing and integration services improve the return on your technology investments while delivering project success. And our project management expertise helps you complete your initiatives on time and on budget.

MCP is passionate about creating environments, processes and systems that enable our clients to experience greater success. We do this by bringing innovative ideas to every project with the end goal of improving your operations. Our application expertise spans all aspects of public safety communications including emergency services studies, computer-aided dispatch (CAD), logging, records management systems (RMS), geographic information systems (GIS), mobile data and more. We believe that the way in which these applications combine with other systems and your agency’s unique organization is fundamental to success. Our specialized team of experts work shoulder to shoulder with our clients to align requirements with their goals to implement the best possible solution.

Our operations and facilities services include: operations consulting; technology procurement and implementation; shared services and consolidation; strategic and executive-level consulting; facility planning services; and professional development and mentoring.

Facility and Technology Design and Integration

MCP is well-versed about the requirements of mission-critical facility architectural and engineering design and we are highly qualified to manage the many complexities that arise with each facility project. We also apply our understanding of all elements of the facility construction—including site selection and development, and implementation of electrical, mechanical, structural, security and other technology systems—to coordinate systems installation, acceptance, training and the operational transition.

The focus of every project is to optimize the functional use of space for operational integrity. We work closely with the client to develop technology solutions, migration schedules and a forward-looking operations floor layout that scales as each client’s needs grow. Our team has a profound passion for results, an indefatigable work ethic, and a proven record of success; we utilize industry-leading intellectual capital to provide highly responsive and customized solutions and strategies for our clients.
Shared Services and Consolidation

In today’s market, everyone is asking, “How can we do more with less?” Communications centers are impacted by this question as budgets become tighter, technology matures, operational demands become more complex and training needs increase. Many are finding that consolidation is a solution to consider. The MCP team has extensive experience with consolidation efforts in past public-sector roles and as consultants.

We recognize that elected and public safety leaders strive to provide the most effective and efficient emergency response system possible. Ultimately, the delivery of quality life-safety services is the achievable objective. We develop a collaborative approach with our clients to assess the opportunity for operational and administrative efficiencies through potential consolidation, colocation or organizational change. Our professionals use an impartial and even-handed approach that has a proven track record of success.

Today’s economic realities require a thorough program analysis to define a future path to economizing, while effectively delivering service. Appropriately applied, consolidation or colocation can achieve operational efficiencies through systemic interoperability via staffing, scheduling, technology, training and reduction in systems’ costs.

We appreciate the necessity of balancing seemingly competing objectives while at the same time addressing operational, organizational, technological, fiscal, human resources and governance issues. The variables and constraints associated with each are carefully weighed to develop an approach with a lasting solution. MCP is sensitive to the sense of ownership and loyalty each community and agency has concerning their local communications center. We honor the history of service while providing an independent view of how the community is best served by advancing to the future. To ensure a comprehensive yet smooth transition, we provide migration assistance and help address the challenges inherent in combining organizational, facility, technological and operational resources.
Network and IT Support Services

We help our clients increase the reliability of their network and IT environment long after implementation. Our holistic, IT and network support solutions help our clients realize significant IT cost savings while remaining confident that their systems are running at peak performance, protected from unplanned network outages.

Clients partner with us so that they can focus on the strategic aspects of managing their public safety operations while we provide expanded continuity, capacity, and capability. We provide solutions that achieve our clients’ goals, not their vendors’, by applying a technology-independent approach.

With MCP’s help maintaining their network environment, our clients have greater confidence that their IT infrastructure and related systems are running smoothly. Our objective is to help our clients drive a greater return from their maintenance investments while reducing their operating expenses. We provide a broad portfolio of assessment, monitoring, and support solutions that improve network reliability and provide agencies with greater insights into their IP network and IT enterprise.

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These support solutions can provide a holistic, end-to-end view into an agency’s entire network and supporting infrastructure with support available for the following networks and applications:

- CAD systems
- Call Handling Equipment (CHE)
- RMS
- Microwave and fiber-optic backhaul systems
- ESInets
- Telephony
- 911 and administrative networks
- Environmental site networks
Criminal Justice Integrated Services and Solutions

In the courts, justice and public safety arena, the business environment includes vendors, suppliers, partners, community, private organizations, and various government agencies, MCP’s Integrated Services and Solutions team specializes in the planning and implementation of complex data exchange and integration projects for the criminal justice market. Our project successes include integration initiatives that span all major entities within the criminal justice community, including:

- Law enforcement
- Prosecution
- Public defenders
- Courts
- Probation
- Adult/Juvenile Corrections
- State bureaus of investigation
- Human and health services.
- Child support
- Social Services
- Department of Motor Vehicles
- Social Services
- Department of Motor Vehicles

At MCP we’ve made it our business to help you facilitate, integrate, and improve your ability to work together – by focusing on workflow integration – to achieve real-time accessibility to information that is relevant to the business environment. This event-triggered information sharing also has the benefit of reducing paper dependencies, cutting costs, and uncovering innovative revenue opportunities that exists in your ecosystem.

MCP has implemented large-scale, multi-year workflow integration projects at both the state and county level. The benefit to our clients is that our full range of system integration capabilities is augmented with real-world experiences, proven methodologies, industry standards, and best practices that are demonstrated in the breadth, depth, and realism of our strategic planning and implementation efforts.

Our court, justice, and public safety capabilities include, but are not limited to:

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MCP uses national standards, modeling tools, and open technologies day in and day out, including:

- Justice Information Exchange Model (JIEM)
- Service-Oriented Architecture (SOA) and Global Reference Architecture (GRA)
- Web Services Standards
- eXtensible Markup Language (XML) Standards and National Information Exchange Model (NIEM)
Proposal for Professional Services
Public Safety Radio Infrastructure Replacement
Stockton, CA

Revised - June 3, 2020
Proposal for Professional Services
Stockton, CA - Public Safety Radio Infrastructure Replacement

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Proposal for Professional Services
Stockton, CA - Public Safety Radio Infrastructure Replacement

Section 1: Firm Background & Experience

Trott Communications Group, Inc. (“Trott”) is pleased to respond to the request by the City of Stockton (“City”) for professional services associated with the planned replacement of its public safety radio infrastructure.

Trott is a WBE-owned and independent RF engineering firm, dedicated to public safety and private communications since its inception over four decades ago. Trott’s primary contact is Keith Whitt, V.P. of Consulting Services; who may be reached at 972-518-1811 or at keith.whitt@trottgroup.com. All work will be performed at Trott’s corporate office at 1303 W. Walnut Hill Lane, Suite 300, Irving, TX or at City facilities as required to execute the Scope of Work described herein.

Raymond C. Trott Consulting Engineers, Inc. was formed as a Texas-chartered corporation in 1978 by Raymond C. Trott, P.E., to provide professional engineering services to the Public Safety, Utility, Paging, Land-Mobile, and Telecommunication industries. The firm was renamed Trott Communications Group, Inc. in 1995. Roxanne Trott assumed the presidency in August 2011. Trott has never had a vested interest in the sale of any communications equipment and is independent of all equipment manufacturers. Trott is a certified and registered engineering firm by the Texas Board of Professional Engineers (Registration # F-000134). Trott is certified as a Women’s Business Enterprise (Registration # WBE1801299), a Small Business Enterprise (NAICS # 541990), and a Texas Historically Underutilized Business (Vendor # 509806).

Trott’s experience includes serving Public Safety, Utility, Transportation, Common Carrier, Business, Cellular, and Industrial clients. Two of Trott’s staff are Licensed Professional Engineers in the State of Texas, with one of those PEs also professionally licensed in the States of Washington, Oregon, Hawaii, Maryland, and New York. Two of Trott’s other engineers have attained the EIT distinction.
Trott has over 40 years of documented experience in the design, procurement and implementation of a vast assortment of radio communications systems including system replacements and/or upgrades, wide-area coverage design, technology upgrades and conversions, analog and digital systems, P25 (Phase 1 & 2) systems, DMR (Tier II & Tier III), conventional and trunked systems, 800 MHz rebanding, testing, system operational and performance assessments, consolidated networks and/or dispatch centers, 800 MHz, 700 MHz, UHF and VHF radio systems. Trott is currently engaged in several projects exploring private LTE opportunities for its utility and transportation clients.

Trott has managed over 200 critical infrastructure projects to a successful conclusion. System upgrades have been performed utilizing various manufacturers/vendors including Motorola Solutions, Harris Corporation, E.F. Johnson, Airbus DS (formerly Cassidian Communications), and TAIT, as well as DMR system providers; all of whom have provided turnkey projects to Public Safety and Public Service/Utility organizations, with independent engineering consulting and project management provided by Trott. All recent projects have included IP backhaul and smartphone gateways such as WAVE, BeOn, ESChat, and Kodiak Networks. Examples of recent projects include:

*Daviess County, KY: P25 Simulcast Upgrade - Needs Assessment & Procurement*

*Kenton, Boone, & Campbell Counties, KY: P25 Phase 2 Simulcast - Motorola infrastructure*

*Greenwich, Connecticut: 800 MHz P25 Phase 2 Simulcast - Motorola Infrastructure*

*Rockwall, Texas: 700 MHz P25 Phase 2 Simulcast - Harris infrastructure*

*DFW Airport, Texas: 700/800 MHz P25 Phase 2 Simulcast - EF Johnson infrastructure*

*Wethersfield, Connecticut: 800 MHz P25 Phase 2 Simulcast - Harris infrastructure*

*Asheville, North Carolina: 800 MHz P25 Phase 1 Simulcast - Motorola infrastructure*

*Sedgwick County, Kansas: 800 MHz P25 Simulcast - Airbus DS infrastructure*

*Orleans County, New York: 800 MHz P25 Simulcast - Harris infrastructure*

*Morgan County, Alabama: 700 MHz P25 Multisite - Motorola infrastructure*

*Richardson, Texas: 800 MHz P25 Simulcast - Airbus DS infrastructure*
Detailed descriptions and references are included in Section 6. Additional references are available upon request.

Trott worked with Stockton in 2016 to perform an assessment of its public safety radio system requirements, dispatching requirements, and to review the various upgrade options available at that time. Trott surveyed communications sites, met with system stakeholders, met with representatives from San Joaquin County, met with vendor representatives, reviewed existing upgrade proposals, and reviewed the San Joaquin Operational Area Master Radio Communications Plan. The assessment ultimately presented options and recommendations for the development of a long term communications plan. This background information and knowledge will provide start-up efficiencies and should prove beneficial to the City and overall project success.
Trott takes great pride in providing flexible and customized approaches to executing critical communications projects. Trott has worked on projects with a wide range of scopes and procurement methodologies and has often made significant adjustments within an active engagement.

There is no “cookie-cutter” solution or standard approach to public safety communications. Any project must begin with learning the unique priorities, requirements, and constraints of the client. This understanding dictates the best path forward for the specific situation. Recent project scopes have included:

- Needs Assessment Study
- Interoperability Study/Plan
- Public RFP for a turnkey communications solution
- Private RFP with bid invitations to pre-vetted providers
- Add-on to an existing Core to create a regional system
- Separate and independent procurements for P25 infrastructure, console system, Fire Station Alerting System, Digital Voice Recorder, and user equipment
- After-Action Review
- Broadband Spectrum Analysis
- CBRS Private LTE Study

Regardless of the specific project scope and procurement methodology, Trott’s primary goals are protecting the best interest of the client and ensuring that user expectations are ultimately met.
Section 3: Scope of Work

Trott has reviewed the project scope, requested tasks, and required deliverables. Trott is prepared to satisfy all project requirements and has developed the following Scope of Work (SOW).

Task 1: Site Surveys & Facility Requirements
Trott will survey all existing repeater, receiver, and dispatch site locations. The surveys will document site locations, site conditions, and available space for future upgrades. The task deliverables will include survey data, an assessment of suitability, required site improvements, and recommended locations for inclusion in future system upgrade plans.

Task 2: Capacity Analysis & Requirements
Trott will perform an analysis of existing airtime usage. A UHF logging receiver will be placed at a central location to collect transmission data for up to ten RF channels. To minimize cost, Trott is proposing that one week of airtime data be collected concurrently with other survey and review tasks. The collection process can be extended by one week as an optional task. The pricing section will include one week of data collection in the primary project pricing and a separate option for the additional week of data collection.

The airtime data collected will be processed and analyzed to determine relevant airtime statistics including:

- Busy Hour
- Busy Hour Airtime
- Average Airtime
- Average PTT Duration
- Other Relevant Metrics

Trott has developed a traffic analysis model based upon Erlang-C trunking formulas. The Stockton airtime statistics will be utilized with the traffic model to determine recommendations for channel/talkpath requirements. The analysis will also present considerations and recommendations related to possible system solutions including conventional, P25 Phase 1, and P25 Phase 2 (2-slot TDMA).
Task 3: FCC Regulatory Efforts
Trott will perform an analysis of existing UHF frequencies to determine which are most suitable for the proposed system upgrade. The frequency plan will consider capacity requirements, frequency separation, antenna system requirements, and relative intermodulation potential. Backup repeaters and other conventional stations will be included in the frequency plan. Trott’s pricing includes a pre-coordination search through APCO to validate spectrum feasibility.

Trott will prepare FCC applications for submission to the relevant frequency coordinator. Actual frequency coordination fees are unknown at this time as they are dependent upon final site and channel counts. Therefore, it is assumed that the City will be responsible for frequency coordination fees to support the system upgrade plan. The FCC applications will request an extended implementation schedule or waivers for an extension of the construction deadlines. Trott will file construction updates and/or extension requests as needed for up to three years at no additional cost.

Task 4: Assist with Vendor Scope of Work & Proposal Review
Trott will assemble the system upgrade requirements and phasing plan into a concise document for review and approval by the City. It is noted that certain information regarding system requirements and features may not be specifically addressed in Tasks 1-3 above, but will be needed for the requirements document. Trott is proposing that the survey efforts in Task 1 include discussions with key stakeholders to capture these additional needs and requirements. Trott will also conduct follow-up discussions as needed during development of the requirements document.

The document will provide high-level design, requirements, and technical direction for the following major subsystems:
- Microwave & T1 Backhaul System
- Conventional Radio System(s)
- Trunked Radio System
- Backup & Interop Systems

Specific requirements will be included for:
- Repeater and Receiver Systems
- Dispatch Console System and Workstations
- Site Selection
- Frequency Plan
After the upgrade requirements have been agreed upon, Trott will prepare the technical sections of a Request For Proposals (RFP) document, which will be utilized to solicit upgrade proposals from qualified vendors. After publication of the RFP, Trott will assist with RFP questions, clarifications, and addenda as needed.

Once final proposals and pricing have been received, Trott will provide technical assistance with the evaluation process. Trott will verify compliance with all RFP requirements, prepare a proposal analysis/comparison matrix, and validate the City’s cost analysis. Trott will work the City’s proposal evaluation team to clarify questions and provide overall technical assistance.

Although not specifically requested by the City, an RFP cycle typically includes a Pre-Proposal Conference and interviews/presentations with RFP finalist. These items have been included as a separate option that can exercised if deemed valuable to the City.
Section 4: Pricing & Schedule

Trott anticipates the total project timeframe through delivery of the requirements document to occur over three months. Subsequent preparation and publication of the RFP document is anticipated to require an additional 45 days. Review and analysis of vendor’s proposals will occur after receipt of the final system proposal(s). Table 1 outlines tasks, hours, and expenses assigned to the primary deliverables, including one week of airtime collection. Table 2 presents an option to add a week of airtime data collection. Table 3 provides an option for support of a Pre-Proposal Conference and vendor interviews/presentations. Trott’s billing rate is quoted herein at $160 / hour.

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<td>Survey Report W/Recommendations</td>
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Table 3 - Option
Section 5: Staff & Credentials

Trott will assign Keith Whitt and Tom Murphy to the project. Mr. Whitt and Mr. Murphy have extensive experience with public safety radio projects and will bring valuable expertise to the County. Furthermore, Mr. Whitt worked with Stockton in 2016 with the previous radio system and console analysis project. Resumes for Mr. Whitt, and Mr. Murphy are provided below.

Keith L. Whitt, E.I.T.
Trott Communications Group, Inc.
Vice President of Consulting Services

Qualifications
- More than 28 years’ experience in land-mobile communications RF system design. He has actively managed numerous Public Safety, paging, utility, and commercial communications projects;
- Has served with Trott for 28 years and as Director of Technical Services for ten years and Vice President of Consulting Services for six years;
- Senior Project Engineer on many long-term projects in Public-Safety systems;
- Assignments have included VHF, UHF and 700/800 MHz public safety and utility systems in a variety of terrains and locations; including significant P25 Phase 1 and Phase 2 experience;
- Extensive propagation and coverage evaluation experience;
- Extensive acceptance test plan development and execution experience;
- Extensive interference mitigation experience;
- Broad experience in Needs Assessments and Public Safety requirements;
- Board experience with authoring of technical specifications and procurement documents;
- Experience in interoperability planning;
- Experience with large Distributed Antenna Systems and in-building coverage systems; and
- Experience with strategic planning for private LTE networks.

Education
BSEE- Electrical Engineering, University of Texas at Arlington, 1991, Arlington, TX

Professional Designations
Engineer in Training, State of Texas
Professional Experience

**Vice President of Consulting Services - Trott Communications Group, Inc., 2012.**
Promoted to Vice President due to exceptional performance in all areas of engineering for land mobile radio. Supervise planning and control activities for all engineering activities.

**Dir. of Engineering Services - Trott Communications Group, Inc., 2001-2012.**
Promoted to Director of Technical Services due to performance, knowledge and skills set development. Works on Trott’s more complex assignments and manages engineering resources for many projects.

**Sr. RF Systems Engineer - Trott Communications Group, Inc., 1994-2001.**
Sr. Engineer for a variety of Public Safety, utility, two-way paging, and commercial communications projects using various technologies and frequency bands.

**RF Systems Engineer - Trott Communications Group, Inc., 1991-1994.** Provided RF engineering, FCC licensing, coverage testing, and interference mitigation for a variety of land mobile and Public Safety communications projects.

**Professional Development with Trott Communications Group, Inc.**
Mr. Whitt has developed extensive expertise in wireless communications for Public Safety and utility applications while with Trott. He manages Trott’s engineering resources and is involved in many of Trott’s most challenging and technical projects. He has participated in numerous narrowbanding projects, rebanding efforts and design of digital P25 systems.
Thomas P. Murphy, P.E.
Trott Communications Group, Inc.
Senior Project Engineer

Qualifications
- Has served with Trott for over 20 years;
- Public Safety system design, licensing and support, testing;
- Coverage studies, testing, modeling
- Procurement Specification Preparation;
- Experience in needs assessments, project management, 800 MHz rebanding, and interoperability studies for Public-Safety requirements.

Education
BSEE- Electrical Engineering, Duke University, 1994, Durham, NC

Professional Designations
Licensed Professional Engineer:
  State of Texas PE # 100024
  State of Washington PE # 57160
  State of Oregon PE # 94620
  State of Hawaii PE #18497
  State of New York PE #090656
  State of Maryland PE #44142

Professional Experience
Senior Project Engineer - Trott Communications Group, Inc., Irving, TX 2007-Present.
  Promoted to Senior Project Engineer due to achievement of Professional Engineering Certification and professional development.


Professional Development with Trott Communications Group, Inc.
Mr. Murphy has gained experience in Public-Safety applications during the last ten years while with Trott. He participates at various industry-sponsored seminars and discussions and stays up-to-date on technical developments. Mr. Murphy has gained extensive experience in antenna site management, site construction oversight, site acquisition and project management.
Section 6: Project References

Dallas/Fort Worth International Airport
P25 Radio System Upgrade
Engagement Dates: January 2014 - present
Engineers: Whitt and Murphy

Trott was retained by DFW Airport to assist with replacing a Harris 800 MHz EDACS system with a P25 Phase 2 system. Trott developed the system upgrade needs and requirements and prepared a conceptual system design. The resulting requirements were then utilized to author technical sections of a Request For Proposals. The RFP included P25 simulcast infrastructure, ISSI gateway, smartphone gateway, user equipment, microwave backhaul, dispatch consoles, and a digital voice recording system. Trott provided technical analysis of vendor proposals and assisted the evaluation committee with selection of an EF Johnson simulcast solution. Trott has continued to support the implementation process with design reviews, fleet mapping, radio programming templates, interoperability planning, test plan development, detailed acceptance testing. The system was activated in January 2019.

Trott also provided RFP and implementation support for a separate Distributed Antenna System (DAS) for P25 and airline radio coverage throughout all DFW Airport terminal buildings. Acceptance testing for the DAS will occur in early 2020.

Trott continues to work with DFW Airport on various communications projects including strategic plans for private LTE and implementation of CBRS.

Contact: Charles Packard
Sr. Manager
Life Safety & Radio Svcs.
Information Technology Services
Dallas Fort Worth International Airport
P.O. Box 619428
DFW Airport, TX 75261-9428
972) 973-5308
cpackard@dfwairport.com
City of Rockwall, TX
System Upgrade & Narrowband Conversion
Engagement Dates: 2002 - present
Engineer: Whitt

The City of Rockwall and the City of Heath, TX retained Trott to develop a “Public Safety Radio Study and Needs Assessment” to improve system performance and meet narrowbanding requirements. Rockwall sought a review of its operations with the specific objective of the development of a five-year strategic plan. The strategic plan was used as a basis for the development of an interoperability plan for all the communities in the county.

Trott performed frequency coordination and FCC licensing tasks and prepared a Request for Statements for the procurement of a UHF-simulcast, trunked radio system. Trott served as technical consultant throughout the system implementation phase in 2005-2006. The Harris simulcast trunked system achieved final acceptance in January of 2007.

In 2009, Trott was retained to develop a long term system upgrade and strategic plan. In 2014 the City of Rockwall and Rockwall County agreed to the joint purchase of a countywide P25 Phase 2 simulcast system. Trott continued to support the City of Rockwall throughout the process and worked with Rockwall County and its consultant to ensure the best interest of the City were met. A contract was awarded to Harris Corporation in 2015. Trott supported the implementation through design reviews, factory staging, acceptance testing, and system cutover in December 2018. Trott continues to support Rockwall in various projects.

Contact: Joey Boyd
Director of Internal Operations
385 S. Goliad Street
Rockwall, Texas 75087
(972) 772-6408
JBoyd@rockwall.com
Boone, Campbell, & Kenton Counties, KY
P25 Phase 2 Regional System
Engagement Dates: August 2014 - Present
Engineers: Whitt and Murphy

Trott was originally retained by Kenton County in 2014 to perform an audit and detailed assessment of various public safety communications systems in operation throughout the County. Trott research end-of-life and end-of-support issues associated with various systems. Trott also evaluated radio site locations, conducted interviews with stakeholders, documented deficiencies of the existing systems, and collected requirements for future upgrades. Conceptual designs were prepared for multiple upgrade options and all information was compiled into an Analysis and Recommendations Report.

After selection of a path forward, Trott developed an RFP for a countywide radio system in August of 2016. Prior to RFP release, Boone and Campbell Counties joined the efforts, and the project was converted to a three-county regional system. Trott modified the RFP document to include the needs and requirements of all public safety agencies within the three counties; the revised RFP was published in October of 2016.

Trott assisted the counties with responses to RFP questions, a pre-proposal conference, vendor site walks, and proposal evaluation. Motorola Solutions was awarded a contact in June of 2017 for a 26-site, 3-zone, 700 MHz P25 Phase 2 network. The procurement included a redundant microwave loop backhaul system, 22 dispatch consoles at three separate dispatch centers, a VHF fire alerting overlay, digital voice recorder for each dispatch center, and smartphone gateway system.

Trott has supported the implementation through design reviews and factory staging and will continue that support through the project's final acceptance in 2020.

Contact: Joe Shriver
County Administrator
303 Court Street
Covington, KY  41011
(859) 392-1400
joe.shriver@kentoncounty.org
Daviess County, KY

P25 County System

Engagement Dates: March 2019 - Present

Engineers: Whitt and Murphy

Trott was originally retained by Daviess County in 2019 to perform an audit and detailed assessment of the various public safety communications systems in operation throughout the County. Trott research end-of-life and end-of-support issues associated with various systems. Trott also evaluated radio site locations, conducted interviews with stakeholders, documented deficiencies of the existing systems, and collected requirements for future upgrades. Conceptual designs were prepared for multiple upgrade options and all information was compiled into an Analysis and Recommendations Report.

After selection of a path forward in February 2020, Trott and the County are in the process of developing an RFP for a countywide radio system. The RFP will primarily serve the County and its agencies but will also explore the possibility of incorporation of the County seat’s existing P25 trunked radio system. The RFP development is in process with a goal of a 2020 Q2/Q3 publishing date.

Contact: Jordan Johnson
Daviess County Fiscal Court
212 St. Ann Street
Owensboro, KY 42303
(270) 685-8424
JJohnson@daviessky.org
Town of Greenwich, CT
Radio System Upgrade
Engagement Dates: 2013 - Present
Engineers: Whitt, Murphy and Black

The initial phase of the Greenwich project included a detailed assessment of the existing 800 MHz Motorola mixed-mode Astro Digital & Smartnet II analog trunked radio system. Trott inventoried the system, researched end-of-life dates, researched projected end-of-support dates, and evaluated potential upgrade paths. Interviews with user departments were conducted to develop needs and requirements. An extensive coverage analysis was performed to identify coverage deficiencies and potential solutions. System usage data was analyzed to determine system loading and spectrum requirements going forward. Budgetary cost estimates were prepared for multiple upgrade options. The information was compiled into a conceptual system design and comprehensive needs assessment report.

Trott further worked with the Town to prepare a Request For Proposals for a replacement microwave backhaul system and assisted with proposal evaluation and vendor selection. The microwave vendor was placed under contract in July of 2015. Trott developed a Request For Proposals for an 800 MHz P25 Phase 2 radio system upgrade. Trott assisted with proposal evaluations, vendor interviews, and final system selection. The Town executed a contract with Motorola Solutions at the end of 2016. Trott has supported the implementation process through design reviews, factory acceptance testing, and technical project management. Final system acceptance expected in early 2020.

Contact: Capt. Mark Kordick
Greenwich Police Department
11 Bruce Pl, Greenwich, CT 06830
(203) 257-0066
Mark.Kordick@greenwichct.org
AVANGRID – Rochester, NY
LMR System Upgrade & Private Broadband
Engagement Dates: 2013 - present
Engineers: Whitt and Black

Trott has supported AVANGRID through various communications projects including frequency acquisition, frequency planning, WiMAX deployment, coverage testing, Request for Proposals for a multi-state LMR system, FirstNet planning, broadband spectrum analysis, and CBRS private LTE strategic planning. It is anticipated that Trott will continue to support AVANGRID through the deployment of any LMR and private LTE systems.

Contact: Pete Stritzinger
Lead Engineer - Microwave, Land Mobile Radio, Fiber
(585) 724-8956
Cell 585-590-0724
peter.stritzinger@iberdrolausa.com

Sedgwick County, KS
Radio System Upgrade
Engagement Dates: August 2011 - present
Engineers: Whitt and Black

Trott was retained by Sedgwick County to serve as its technical consultant during the implementation phase of a 10-site, 20-channel P25 simulcast project. The project also included the deployment of a 24-position IP console system, interoperability equipment, and microwave network. Trott participated in design reviews and configuration planning, and supported all staging tests prior to shipment of equipment. Trott further developed acceptance test plans, inspected installations, and performed acceptance testing. The Cassidian Communications Network was accepted in early 2014. Trott continues to provide post-cutover technical support to Sedgwick County.

Contact: Elora Forshee
Director of Emergency Communications
714 N. Main Street, Wichita, KS 67203
(316) 660-4977
elora.forshee@sedgwick.gov
City of Asheville, NC
P25 System Upgrade
Engineers: Whitt, Murphy and Black
Engagement Dates: June 2013 - December 2017

The initial phase of the Asheville project included a complete assessment of the existing 800 MHz Motorola 4.1 Smartzone trunked radio system and MOSCAD Fire Station Alerting System. Trott inventoried the equipment, researched end-of-life dates, researched projected end-of-support dates, and performed an assessment of potential upgrade paths. Interviews with key staff members were conducted to develop needs and requirements. Propagation studies were performed to examine the coverage performance of existing tower sites and potential candidate sites, and system traffic data was analyzed to project bandwidth and channel requirements. Representatives from Buncombe County and their P25 radio vendor (Cassidian/Airbus DS) were also interviewed to explore the possibility of expanding the existing County system to support City of Asheville agencies. The information was compiled into a comprehensive needs assessment report and conceptual design, which was utilized to gain citywide consensus and secure project funding.

Upon final approval of an upgrade plan, Trott worked with City staff to develop a standards-based Request For Proposals for replacement of the existing radio and FSA infrastructure. The RFP allowed for utilization of an existing P25 core (controller system) and included an optional ISSI interoperability gateway and smartphone gateway. After thorough proposal evaluations and scoring, Motorola Solutions was selected in June 2015 to implement a standalone system with ISSI connectivity with Buncombe County and WAVE smartphone gateway.

Trott prepared a separate RFP for replacement of obsolete microwave backhaul components and assisted with proposal review and contract award. Trott continued to support the P25 and microwave projects throughout the implementation phase including design reviews, radio programming development, installation inspections, and acceptance testing. The new radio system was activated in November 2016. Trott continued to provide technical support through project closeout in 2017.

Contact: Jeff Reble
Senior Project Manager, I.T. Services Dept., Support Services Div.
70 Court Plaza Asheville, NC  28801
(828) 259-5756
jreble@ashevillenc.gov
CSI TELECOMMUNICATIONS, INC.
CONSULTING ENGINEERS
750 Battery St., Suite 350, San Francisco, CA 94111

Mr. Terrell Harper
Project Manager II
Information Technology - 4th Floor
City of Stockton
400 East Main Street
Stockton, CA 95202 - 3003

March 19, 2020

CSI TELECOMMUNICATIONS, INC. PROPOSAL TO THE CITY OF STOCKTON RFP:
PUBLIC SAFETY RADIO INFRASTRUCTURE REPLACEMENT

CSI Telecommunications, Inc. is pleased to respond to your Request for Proposal for a consultant to act as the City's Project Manager focused on the technical aspects for your replacement and/or upgrade of your Public Safety Radio Communications System.

We have read your scope and proposed tasks and agree fully to the tasks and deliverables included in your RFP. The following narrative describes our vision for accomplishing these tasks.

Task 1: Site Survey & Facility Requirements

CSI will utilize two engineers, Bill Ruck and Craig Trygstad, to survey each of your eight RF sites as well as your two dispatch locations and Public Works. Our thought is that two sets of eyes will improve our ability to catch issues as well as to effectively capture site information. Bill has over 40 years of experience with radio communications and is our subject matter expert on site conditions. Craig has over 30 years’ experience, primarily as a Motorola engineer, and would focus on R56 compliancy as this will be key in the negotiations with Motorola especially with respect to how to treat the assumptions in their Statement of Work (SOW). Craig is a California registered Professional Engineer and also holds a current Project Management Professional certificate thru PMI. He will lead CSI's team on your project. Their resumes are appended to this proposal.

We anticipate visiting four of the eight RF sites each day and one day visiting the two dispatch centers and public works for a total of three days for site visits (six engineering days in the field) and additional time for documentation and recommendations. We're intending to stay overnight locally for two nights to minimize any interruptions to the survey schedule.

Task 2: Capacity Analysis & Requirements

Based on the twelve UHF channels that CSI believes are currently licensed to Stockton (six police, five fire, and one public works) ideally twelve recording systems will be needed to capture data as directed by the RFP to accurately depict traffic; as the traffic on each channel is interrelated to one another. Depending on the logging recording system the City utilizes, it may be possible to retrieve some or all of this data from that system. CSI has equipment to record a single channel using an Icom receiver connected serially to an HP Omnibook 3000 and software specific to capturing PTT and call duration data. CSI will have to research if this setup can be duplicated using current technology to increase our
capacity to capture more than one channel simultaneously. These variables make estimating this portion of the task in terms of hours of effort difficult. We've based our estimate on the assumption that a solution to recording the channels simultaneously can be achieved and that developing this solution will take a moderate amount of time.

Once we have collected the data, CSI uses Erlang-C calculations as a first step in creating a traffic analysis. We also utilize Minitab™ which is a statistical software package which can create a fuller picture of the radio traffic and its distribution to prove a more accurate model through tools such as checking for Gaussian data distribution, identifying means and standard deviations, and if in the future a trending analysis is needed, linear and non-linear regression can be utilized. CSI has expertise in creating detailed traffic reports, most recently analyzing the traffic over each of the six simulcast subsystems and two standalone trunked sites for East Bay Regional Communication System Authority (EBRCSA) in two separate reports. The first report base-lined the system prior to the addition of new agencies, and the second analyzed the system after the addition and projecting future growth going forward.

Task 3: FCC Regulatory Efforts

CSI is well versed with FCC licensing as well as the steps needed locally at the regional frequency coordination meetings. CSI attends and participates in these monthly meetings on a regular basis. In this task, we will create regulatory contour maps to submit to the frequency coordination committee and represent you. Once the committee has approved the submittal, we will then begin the process of licensing the channels and drafting requests for Letters of Concurrence if needed. We will file applications and modifications for the licenses and track it through the licensing process. Please note that frequency coordination fees are not included in this proposal.

We agree to your request to file any necessary extension requests with the FCC through the first three years of the project at no charge. Our Vice President and General Counsel, Philip M. Kane, P.E. / Esq. is licensed to practice before the FCC Bar.

Task 4: Assist with Vendor Scope of Work (SOW) and Proposal Review

This final task is the keystone to this project. We assumed the City intends to enter into sole source negotiations with Motorola and CSI can provide specialized expertise in negotiating with this vendor. We are currently working with the three cities of Fairfield, Vacaville, and Suisun City in the implementation of their replacement trunked system, taking them from analog trunking to P25 trunking. During negotiations, CSI identified approximately $500K in equipment that the cities did not need. We accompanied our clients to the staging of the equipment at Motorola’s staging facility and flagged multiple issues to be corrected prior to shipping. We have also been advising our clients and at times advocating on our clients’ behalf during implementation with respect to proposed change orders and quality standards. We have been working with EBRCSA on various Motorola system enhancements and upgrade proposals as well. If you need it, we would be happy to provide contact information for any of the clients referenced in this proposal.

We are well versed in what is and is not included in Motorola’s System Use Agreement (SUA). We have current experience with the pros and cons of Motorola providing a microwave system through a subcontractor. We understand which facets of the system Motorola brings value to and which facets they only provide overhead.

CSI appreciates that the City is requesting its consultant to create the SOW for the project in Deliverable 4a. By doing this, the City can more easily drive the project on its terms instead of allowing its vendor to provide it’s SOW and take more control.
Cost Estimate

The following is our proposed cost estimate based on the above tasks on a time and materials basis. Our hourly rate is $215 per hour and our travel expenses are based on actual expenses plus a 15% administrative fee. Mileage is based on the 2020 IRS rate of $0.575 per mile and receipts will be provided for any expenses of $20 or more.

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Our cost estimate assumes a single vendor will contract with the City. Additional time may be required if some of the subsystems, as stated in the RFP, are split directly to another vendor (e.g. microwave). We are also open to a partial award of this project should the City elect to split the project to multiple consultants, depending on who is selected as the other consultant.

We have previously signed contracts with the City of Stockton and our insurance coverage is current and acceptable to your risk manager; thus we do not anticipate any contracting issues unless there are recent, significant changes to your contract. We have successfully provided our engineering as well as licensing services to the City of Stockton in the past and hope we can do so again for this new project.

Thank you for the opportunity to respond to this RFP and for your consideration of our proposal.

Best regards,

Catherine F. Newman
President
CSI Telecommunications, Inc.

Appendix: Qualifications of the CSI Team
Qualifications of the CSI Team

Philip M. Kane, P.E. / Esq., Vice President of CSI Telecommunications, Inc., General and Regulatory Counsel  Mr. Kane has over 50 years’ experience with radio engineering and radio system development. Phil was employed for over 28 years in an engineering capacity with the Federal Communications Commission, including Engineer-in-Charge of the San Francisco District, and is a specialist in the measurement and verification of radio system parameters and compliance with regulatory requirements. A specialist in RF interference issues and regulatory law, he is especially successful in writing waiver requests and special requests for unique engineering applications that are approved by the FCC. His experience includes public safety radio systems, upgrades, and problem resolution projects.

Admitted to legal practice in California and Federal venues as well as before the Federal Communications Commission, he also holds several operator licenses from the FCC. He is a Life Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and a Life Member of the Society of Broadcast Engineers (SBE). Phil earned the Bachelor of Electrical Engineering degree from The Cooper Union School of Engineering (NY, NY) and the Juris Doctor DEGREE from San Francisco Law School. A Registered Professional Electrical Engineer in California, Nevada, Oregon, and Utah, he is eligible in all other jurisdictions.

Craig Trygstad, P.E./PMP, Principal Engineer  Mr. Trygstad has 30 years of experience in the Land Mobile Radio industry, working as a system engineer with Motorola for 20 years and a Presale Project Manager for five years prior to his tenure at CSI. He is a Registered Professional Engineer in California and Nevada and has a Project Management Professional (PMP) certificate through PMI. While at Motorola, he served as the Coverage Subject Matter Expert (CSME), serving as the liaison between fellow system engineers and the Research Development Engineering (RDE) group for the Western Region.

Craig has extensive knowledge of the local radio systems, including three projects with the City of Roseville while at Motorola. He was the lead engineer for the Sacramento Regional Radio Communication System (SRRCS) from its inception in 1992 until moving into his project management position in 2014. He was also involved with projects with Placer County in both of his roles at Motorola as well.

At CSI, Craig has lead a number of projects, including the P25 upgrade for the Fairfield/Vacaville system and VHF system projects including Lincoln City (Oregon). He earned his B.S.E.E from the University of California at Davis and a Master’s Certificate in Project Management from George Washington University. He is a member of both the IEEE and PMI.

William F. Ruck, Principal Engineer  Mr. Ruck has over 43 years of experience as a broadcast engineer. His experience includes simulcast public safety radio systems engineering, computer software based radio frequency coverage prediction using EDX SignalPro™, upgrades and problem resolution projects for radio frequency interference issues, RF communications systems, and data communications. Bill graduated from the United States Navy AV Class “A” School, NATTC Memphis and has completed Basic Engineering and Business coursework at UC – Berkeley. He is a NARTE Certified Engineer, Class 1, and holds an FCC General Class Radio Telephone Operator License with Ship Radar Endorsement.

Bill is a commercial member of the Association of Public Safety Communications Officials (APCO). He is the Chair of the Northern California Frequency Coordinating Committee (FCC Part 74), a member of the Society of Broadcast Engineers (SBE), a former Chairman and Vice-Chairman of SBE Chapter 40, and an accredited Frequency Coordinator. He is also a member of NARTE, the IEEE, and EIBASS.
Professional Services Estimate
June 4, 2020

Project Goal
The goal of the project is to establish and recommend the most appropriate path for replacement and/or upgrade of the City’s end of life Public Safety Systems to ensure reliable operations and future manufacturer support. The new City system will be installed in phases. New backhaul and conventional P25 systems would be installed initially, followed by a conversion to trunking later that eventually supports all City departments.

Scope of Project
FTE will act as the Technical Project Manager / Owner’s Engineer focused on the technical aspects of the communication systems. The project will include the following:

- All city repeater systems
- Associated backhaul (e.g., connectivity between repeater and dispatch sites)
- Tower sites

The City’s P25 core and dispatch consoles are currently being tested and will be installed in the coming months. We understand that FTE would not be involved in the installation, initial configuration or testing of the new consoles or the core. But we must ensure they are integrated with the new radio systems in the near future.¹

Vehicular and handheld radios have already been replaced but will require updating when the system is updated to a trunked system.

FTE completed an initial Project Plan in late 2018 and later performed some coverage analysis work. We propose to revisit and update this work as needed through some initial meetings with the City’s project team to ensure its meets the needs of the stakeholders.

Proposed Tasks
Efforts include weekly teleconferences and on-site meetings as shown in the estimate.

Task 1: Site Survey & Facility Requirements
We have broken this task into several “Activities” that will further describe how we would approach this work.

Activity 1A: Project Team Meeting to Review and Update Direction
FTE will meet with the City’s Project Team to better understand what the status of the project is today, budgeting issues, and to review what has been completed to-date. We will conclude with an overall action plan to move the project forward. FTE will work with the City’s Project Manager to document these in a formal Project Plan letter or memo for distribution to the Project Team.

¹ We also understand that Fire station alerting equipment at stations, dispatch workstation furniture, CAD, E9-1-1 and administrative telephones are not included in this project. These would be quoted separately.
Deliverable 1A: Meeting & Project Plan Letter or Memo

Activity 1B: Perform and/or Update Site Surveys

FTE surveyed many of the repeater sites as part of our previous work. However, conditions may have changed so we will revisit these sites as necessary to determine available space, power and antenna tower requirements for the new systems. This includes eight tower sites, two public safety dispatch locations, the Municipal Utilities Department (MUD) and Public Works. We will consider existing site conditions to determine whether any changes are needed to support the new networks. This information is critical to the next Activity and for the vendor’s Scope of Work (SOW) in Task 4 below.

Deliverable 1B: Site Surveys

Activity 1C: Update Radio Coverage Requirements

FTE developed a preliminary coverage design as part of our previous work. This established what level of coverage each tower site could provide and identified the most optimal ones for reliable indoor and outdoor coverage.

We would work with the Police Fire, Public Works, and Municipal Utilities departments to update their coverage requirements to establish a baseline. FTE will prepare radio coverage predictions using our in-house tools to estimate coverage from existing and potential planned repeater sites. These maps can be tailored for analog FM or digital (i.e., Project 25, etc.) radio channels, and can provide estimates of indoor and/or outdoor coverage for vehicle and portable radios.

While a particular site might provide excellent coverage, leasing issues as well as the availability of back-up power (generator) and equipment space may discount certain sites from consideration, or require mitigation by the site owner and/or City.

The City might consider having FTE perform in-building signal strength measurements if significant coverage gaps are discovered in this Activity and/or if budget limitations reduce the total number of repeater sites that may be needed. This could be quoted once we know the outcome of initial work.

Deliverable 1C: Recommendations for RF locations and sites

Task 2: Capacity Analysis & Requirements

This effort determines the optimal number of radio channels required for the new trunked radio system. Over-sizing a trunked system wastes City resources, while under-sizing it could block or delay important messages over the radio system, often at critical times.

FTE will place airtime logging equipment on-site for a number of weeks to collect real-time radio usage statistics on most all City radio channels. FTE will then use Erlang-C traffic calculations to establish the proper number of trunked channels needed for routine and emergency conditions. This Task is a prerequisite to later steps of the FCC Regulatory Efforts below.

Our analysis and results can also be applied to the City’s planned conventional system. For example, it can show if particular channels may be over-loaded, while others are underutilized or sit idle; this could suggest a need for rebalancing or redistributing units among the channels, changes in dispatch staffing/assignments, operational changes (if possible, practical and safe), or a need for additional channels. We have even used this information to reallocate channels from one department to another (e.g., when certain departments move to cellular phones, their radio channel become idle and can be used by other departments).
We will need a small secure area to place the equipment and antennas. This could be at a City office as long as we can place two small magnetic-mount antennas outside (one for measurements, the other for cellular access to download the measurements).

*Deliverable 2A: Letter report providing measurement findings and channel recommendations*

*Deliverable 2B: Alternatives and considerations regarding the most viable conventional and trunking systems*

**Task 3: FCC Regulatory Efforts**

This FTE effort determines which existing UHF frequencies can be used for trunking, establishes a network frequency plan, and modifies existing or applies for new FCC licenses. This also establishes the antenna system design that will be needed by the vendor. Our work will include the conventional backup frequencies and those for the new MUD site as well (identified in prior reports).

Even if the trunked system may not be built immediately, obtaining trunked licenses at this time can prevent encroachment by other agencies that could block or negatively impact the City’s plans (e.g., decrease radio coverage, or result in additional repeater sites). While FTE cannot guarantee license grants, we have particular expertise in this area an excellent track record of success.

FCC rules require that radio systems be constructed within 12 months of the license grant, but this is routinely extended several years by a formal written request. FTE will submit this request on behalf of the City. The City must file annual milestone updates with the FCC until project completion. FTE will file these documents for Years 2 and 3 at no cost to the City.

*Deliverable 3: Frequency Plan, FCC Applications, Construction Extension Request*

Our estimate for this task does not include mandatory frequency coordination costs. These are unknown but may be less than $9,000.

**Task 4: Assist w/Vendor RFP, Procurement & Proposal Review**

**Activity 4A: Develop Radio & Microwave Technical Specification**

Our goal is to attain several competitive proposals for a new radio and microwave infrastructure.

This document would address the replacement of the related City backhaul system, replacement of the existing conventional network with new hardware, and the eventual upgrade to trunking.

FTE will develop and assemble a system phasing plan, performance requirements, design details, and acceptance test plan requirements into a single concise Technical Specification document, and work with City procurement to issue an RFP. The City would be responsible for the procurement and standard contract “boilerplate” documents.

This document would address the replacement of the related City backhaul system, replacement of the existing conventional network with new hardware, and the eventual upgrade to trunking. While the Technical Specifications will provide a high-level design framework, the vendor would be responsible for selecting the specific parts and manufacturers, and perform the final detailed design (or verify our design).

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2 Our goal is to apply for FB8-class channels that provide channel-exclusivity to the City. This protects from future encroachment by other agencies and can minimize interference.
EXHIBIT A
STATEMENT OF WORK

As new dispatch workstations/consoles and radio system core already exist, it is likely that the radio system must be provided by the same manufacturer to be compatible. This will reduce the efforts required under this Task and this is reflected in our cost estimate.

We see our value as providing technical direction and oversight based on our past experience with many similar projects. Our scope would include the following major systems:

- Microwave and T1 Backhaul System
- Conventional Radio System
- Trunked Radio Systems (including MUD site)
- Conventional Backup System

FTE will provide specific direction for the following components:

- Repeaters and receiver systems
- Interface w/dispacth consoles / workstations
- Tower site selection
- Backup power
- Antenna systems
- Acceptance testing methodology

Deliverable 4A: Technical Specification; other documents as needed.

Note: As of this writing, it is unclear which specific tower sites will be selected to house the City’s new microwave and two-way radios equipment, including at the MUD treatment plant. It is possible that new (or modified) equipment shelters, generators or towers may be required, or that structural work could be needed on existing antenna towers. If the City needs assistance with this part of the project, we would quote that when we have more clarity. The proper time to consider this would be following Task 2 or Task 3.

Activity 4B: Respond to Vendor Questions

FTE would review and respond to vendor technical questions up until the proposal deadline. All questions and answers will be assembled in formal documents for the City to respond to the vendors via mail or email. We would assist with resolution of technical issues that typically arise.

Deliverable 4B: Support City during Procurement

Activity 4C: Review Vendor Proposals

FTE will assist the City with review of vendor proposals. This includes review of compliance with the performance requirements and technical design, project schedule, milestone payment schedule, acceptance tests, cutover/transition approach and portions of the contract terms.

Our review comments are normally described in a letter to the City. This letter will differentiate and organize any technical, contractual and cost issues to assist the City’s Project Team and Procurement Department.

Deliverable 4C: Letter report outlining any area of concern; other documents as needed.
Activity 4D: Review and Validate City’s TCO Estimate

The City may be working on an overall project estimate for budgeting purposes. FTE will review this estimate and either validate it, for make suggestions for improvement.

Deliverable 4D: Validate the City of Stockton Total Cost of Ownership analysis

Estimate & Schedule

Our current professional services billing rate is $210/hr. for the remainder of 2020.

Some of the tasks are highly variable, may will span many months and are out of our control. For this reason, we have proposed to invoice the Activities on a monthly basis, with a Not-to-Exceed (NTE) value, if a particular Activity or Task exceeds two months. We will notify the City if we are expending this amount faster than expected.

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<th>Task Description</th>
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<th>Meetings</th>
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Rates include costs for direct labor, overhead, general and corporate administrative expenses and profit, and are subject to revision upon 30 days' written notice or on January 1, 2021. Total includes travel, lodging, and meals, if any. Rates do not include allowance for State or Municipal Sales or Use Taxes, or taxes or fees levied by any government outside of the United States or any state other than California (none are anticipated). Please note that Task 3 requires that the City cover Frequency Coordination (licensing) costs of less than $9,000. There are no FCC fees for governmental agencies.

END