ALAMEDA COUNTY

East Bay Regional Communications System Authority

CONTRA COSTA COUNTY

Participating agencies include Alameda and Contra Costa Counties and the following cities and special districts: Alameda, Albany, Antioch, Brentwood, Clayton, Concord, Danville, Dublin, El Cerrito, Emeryville, Fremont, Hayward, Hercules, Lafayette, Livermore, Martinez, Moraga, Newark, Oakley, Pinole, Pittsburg, Pleasant Hill, Pleasanton, Richmond, San Leandro, San Pablo, San Ramon, Union City, Walnut Creek, East Bay Regional Park District, Kensington Police Community Services District, Rodeo-Hercules Fire Protection District and San Ramon Valley Fire Protection District

AGENDA ITEM 9.4

AGENDA STATEMENT
BOARD OF DIRECTORS MEETING
REGULAR MEETING DATE: February 20, 2009

TO: Board of Directors
East Bay Regional Communications System Authority

FROM: William J. McCammon, Executive Director
East Bay Regional Communications System Authority

SUBJECT: CTA Communications Contract Revised Scope for Phases II, III, and IV

RECOMMENDATIONS:

1. Authorize the Chair to execute a contract with CTA to proceed with the Revised Scope for Phases II and III of their contract with the EBRCSA.

SUMMARY/DISCUSSION:

At its January 16, 2009 meeting, the Board received a presentation from Dr. Ken Ballard of CTA Communications over viewing their recommendations for Phase I of their contract. One of the recommendations dealt with the revision of the scope of Phases II, III and IV of the existing contract. When CTA responded to the original RFP, they were not as familiar with the progress made by the EBRCSA and responded with a scope that was more appropriate for a system in a much earlier stages of development. The Board took action directing the Executive Director to work with CTA and the RFP Evaluation Committee to develop an alternative scope for the next phases of the project, take the revised scope back to the Operation and Finance Committees for review and approval, and then forward the approved revised scope back to the Board for consideration. CTA provided a revised scope that was reviewed by the RFP Evaluation Committee. Discussions were also held with the Bay Area SUASI as to the progress of the Bay Area-wide RFP for infrastructure and were informed that it was moving forward. If the Bay Area-wide RFP proceeds successfully, there may not be the need for the EBRCSA to individually contract with Motorola. We were also notified that the SUASI was informed by Motorola that all BayRICS participants would be able to obtain Riverside pricing for

infrastructure and subscriber units in the interim period. The Riverside contract was competitively bid and provides extremely aggressive pricing which will be a benefit to the EBRCSA.

The Operations and Finance Committees reviewed the draft scope and agreed to go forward with Phases II and III at this time, and instructed the Executive Director to work with the Committee to finalize the scope and return it to the Board for consideration. The scope has been revised and it is recommended that the Board authorize Chair Shinn to execute a contract with CTA Communications for Phases II and III.

FINANCIAL IMPACT:

The original CTA contract included pricing for Phase II, III, and IV at $665,727. After scope revisions and the removal of Phase IV, the revised amount to complete Phases II and III is $381,326. The total amount is reimbursable through the use of Homeland Security grants received by Alameda and Contra Costa counties.

Proposed Services

The initiative of Alameda and Contra Costa Counties and the Joint Powers Authority (JPA) to develop and implement the East Bay Communications System (EBRCS) is critical to ensure that County, locality and State public safety responders can effectively communicate in emergencies and disasters. The EBRCS will be a standards based, 800/700 MHz/VHF Project 25 (P25) digital shared regional radio communications system providing wide area public safety interoperability communications. Interoperability is the current focus of public safety agencies at the local, State and national levels. The events of September 11, 2001 have reinforced the criticality of interoperable communications for public safety first responders. At CTA Communications, we are experts and experienced in providing system designs, architecture, and specifications for the hardware and software necessary to implement wide area public safety interoperability. We also recognize that interoperable communications, the ability of people to communicate in emergencies and disasters, goes beyond the hardware and software that might be used.

Our Proposed Services approach, with an emphasis on *equipment and operations* and on the *human element* will provide Alameda and Contra Costa Counties, and its participating localities, with the necessary needs assessment (Phase I), design (Phase II), specification (Phase III), system procurement (Phase IV) and system implementation (Phase V) services that will form the foundation for the successful implementation of a new digital regional P25 radio communications system. This system will be shared by multiple County, local, and State agencies and will provide seamless interoperable communications capability for these public safety first responders.

Your interoperability solution needs to be intuitive and practical, not just technically feasible. CTA will provide the assessment, design, procurement, implementation and project management services as requested by this Request for Proposal (RFP) to meet the following project scope objectives:

(1) Review and evaluate existing documentation and make recommendations for the future phasing (build out) of the East Bay Communications System.

(2) Develop design and bid specifications to be incorporated into a formal contract for the build out of the East Bay Communications System.

(3) Work with the EBRCS authority to select a vendor to complete the build out of the East Bay Communications System.

(4) Provide project management services for the oversight of the build out and acceptance of the East Bay Communications System.

(5) Review and evaluate documentation that could help with the ultimate build of the East Bay Communications System in Solano County.

While the obvious responsibility of your consultant is to provide you with the benefit of our technical, design, operational, project management and implementation/acceptance experience, a less obvious but equally important responsibility is to assist our clients in making critical project design, planning and implementation decisions. Part of this second responsibility is to break down technical and operational solutions into understandable language and processes for the EBRCS Project Manager and project team and then guide the project team toward consensus in design, requirements, solutions, specifications, planning, procurement, and implementation.

The language of understanding is where CTA excels!

CTA's project approach will be one of constructive collaboration with all participating EBRCS stakeholders. Our Phase I approach begins with a carefully drawn Project Work Plan and Project Schedule, joining our approach with the multi-phase services and deliverable requirements of the RFP. CTA includes applicable RFP Task statements in **bold** text that correspond to our project approach for each project phase. The headings of the CTA's service elements correspond to service elements or in some cases groups of service elements identified in the Project Schedule.

PHASE I NEEDS ANALYSIS - COMPLETE

The Needs Analysis Phase begins with the EBRCS providing CTA a Notice to Proceed (NTP), and concludes upon the delivery of the project deliverables as outlined in the RFP Specific Requirements, Deliverables, and Reports for Phase I. The Needs Analysis Task 1 below begins with a carefully drawn Project Work Plan.

Task 1 – Conduct Project Kickoff Meeting and Project Planning:

Update Project Work Plan/Schedule. CTA will take our proposed Project Work Plan including the Project Schedule as described herein and amend it to reflect any modifications as a result of negotiations between CTA and the EBRCS. The Project Schedule includes the actual start date and agreed-upon tasks, service elements, or milestone dates as required by the EBRCS.

Review Existing Data. We will ask the EBRCS for copies of existing vendor contracts, reports, operational data, technical and functional data and equipment data. We will also ask for any applicable interoperability plans/studies that are available for our review, including any data/information relevant to Solano County. Our team will carefully review all the given data and material to determine its completeness and adequacy and determine if additional information is required. Once our review is complete, CTA will prepare for the next Task 1 activity – the Project Kickoff Meeting.

Project Kickoff Meeting. The Project Kickoff Meeting will introduce key EBRCS and CTA project team members, to mutually agree on specific project goals and objectives, and to build the strong foundation on which the remainder of the study will rest. During the Kickoff Meeting, the EBRCS and CTA Project Managers will finalize the list of agencies and departments to meet with and the list of radio sites and dispatch facilities to be surveyed. The Project Managers will also coordinate the Group Agency Meeting locations and the schedule arrangements with the overall Project Work Plan and Project Schedule. CTA anticipates that the Kickoff Meeting will last two days, which is typical for a project of this size and complexity. We have found that teleconference and e-mail communications with the EBRCS Project Manager and an associated EBRCS principal prior to this meeting facilitates an effective and productive Kickoff Meeting.

In addition to completing agenda items of the Project Kickoff Meeting, a "Meeting Questionnaire," which will be used for Group Agency Meetings, will also be finalized at the Kickoff Meeting. As a prerequisite to the Kickoff Meeting, CTA will prepare and sent to the EBRCS Project Manager, a preliminary "Meeting Questionnaire" for his review, finalization and approval. The "Meeting Questionnaire" is an important tool used in CTA's needs analysis process.

Meeting Questionnaire. Based on CTA's extensive assessment and study experience, we recommend using two forms of the "Meeting Questionnaire", a hard copy and a web-based version, both of which can be distributed in advance of the start of the meeting sessions with the participating County agencies. The web-based version of the "Meeting Questionnaire" will use our **CTASurveyor**℠ to collect the required meeting information and data.

With the possibility for a high number of group meetings, the challenge will be to obtain a high return rate in the shortest possible time. A meeting participant can use the online meeting information forms, tailored to the needs and analysis documentation requirements of the RFP, access a secure website, and then download and install the **CTASurveyor**℠ Windows application. We have included a brief description of **CTASurveyor**℠ in our proposal Section F. Based on past successful experience, **CTASurveyor**℠ is the right on-line, efficient high-tech, web-based survey tool for the success of the County's critical communication Phase I Needs Analysis.

Once we meet with the listed agencies, and with the "Meeting Questionnaire" finalized, the needs analysis can proceed to Task 2, Evaluation of Existing Systems.

Task 2 – Evaluation of Existing Systems:

Final Data Review. Our team will review any additional data and information obtained at the Project Kickoff meeting. When this review is complete, CTA will prepare for the first Task 2 activity, the Initialization Meeting.

Initialization Meeting. The purpose of an Initialization Meeting is to introduce the EBRCS and CTA Project Teams to the participating County agencies and departments, to provide a preliminary briefing for meeting participants on the project background, methods, goals and answer participant questions that come up about the study process and/or the "Meeting Questionnaire". CTA will provide for all meeting participants a "Technology Briefing" explaining the current state-of-the-art communication technologies and the features of a standards based Project 25 (P25) digital shared regional radio communications system. In addition, CTA can distribute additional hard copy "Meeting Questionnaires" for the participating agency and department representatives that would require one. At the conclusion of each Group Agency Meeting session, CTA will collect the completed hard copy meeting questionnaires so that the data can be for use by our engineers during their analyses.

Typically, an Initialization Meeting will last 2-4 hours. We anticipate Initialization Meeting will start on a Monday morning and be conducted in the City of Oakland. Again, we recommend that teleconference and e-mail communications with the EBRCS Project Manager and associated principals prior to the Initialization Meeting facilitate an effective and instructive Initialization Meeting.

Group Agency Meetings. A very important part of laying the groundwork for the project is to obtain first hand information about current problems, goals and requirements and existing infrastructure. To this end, the CTA Project Team will conduct Group Agency Meetings with the participating County agencies and departments, including representatives from Solano County. The Group Agency Meetings will start at the conclusion of the Initialization Meeting. They will be small group meetings with appropriate supervisory, management, maintenance and user personnel. Every Group Agency Meeting will be documented by CTA, and the meeting participants and the EBRCS Project Manager will be provided the opportunity to review the results before they become part of the Phase I Needs Analysis Report. CTA estimates that all Group Agency Meetings can be completed within a one-week time frame.

Existing Systems Analysis. At this point in the Phase I process, CTA will have accumulated sufficient information and data to begin our overview and evaluation of existing communications systems. CTA's analysis of existing communications systems will first include listing and documenting of the various public safety/public service communications systems that currently exist in the service area of the EBRCS. We will compare the East Bay Regional Communications System coverage requirements with any coverage information that CTA received from the EBRCS or gathered during the Group Agency meetings. We will also assess the degree to which the existing communications systems, including equipment, infrastructure and facilities can be used as part of the new East Bay Regional Communications System. Lastly, our engineers will evaluate data and information pertaining to radio equipment already purchased under Homeland Security (HLS) Grants to see if this radio equipment can be upgraded to P25 Phase II technology. The results of our Existing Systems Analysis will be included in the Phase I Needs Analysis Report.

Task 3 – Review Radio System Documentation and FCC Licenses:

Radio Systems Review. CTA engineers will review all gathered information describing the existing radio communications systems/networks and analyze how these systems or networks might be reused in the new East Bay Regional Communications System. In conjunction with our system/networks analysis, our FCC frequency-licensing specialists will review existing FCC licenses and document any regulatory issues and problems that might influence the planned implementation of the new East Bay Regional Communications System. CTA will work with the EBRCS to see if any additional Group Agency Meetings with the participating County agencies and

departments will be required to review and study the Region 6, 700 MHz Plan. The results of our Radio Systems Review will be included in the Phase I – Needs Analysis Report.

Task 4 – Survey Existing Communications Facilities for Suitability:

Radio Site Surveys. Another important part of laying the groundwork for the project is to become familiar with existing radio sites. To accomplish this task, CTA will perform radio site surveys that will provide existing site information and data that will allow our CTA engineers to complete the different system analyses and the final system design. CTA will deploy two survey teams to complete required site visits and surveys. The first team will survey Alameda County radio sites, while the second team will survey Contra Costa County radio sites. CTA expects to survey the 32 radio sites and complete these site surveys in a two-week period. All site surveys completed by CTA will be documented, and the County survey participants and the EBRCS Project Manager will be provided the opportunity to review the results before they become part of the Phase I Needs Analysis Report. The CTA's site survey teams will gather site data and information using CTA's web-based survey tool, **CTASurveyor**℠.

Dispatch Facility Surveys. Becoming familiar with the existing dispatch facilities is also an important part of the needs analysis process. To accomplish this task, CTA will deploy two dispatch survey teams to complete required dispatch facility visits and surveys. The first team will survey Alameda County dispatch locations while the second team will survey Contra Costa County dispatch locations. CTA expects to survey approximately 31 dispatch locations, and complete these dispatch facilities surveys in a two-week period. All dispatch facilities surveys will be documented, and the County survey participants and the EBRCS Project Manager will be provided the opportunity to review the results before they become part of the Phase I Needs Analysis Report.

Phase I Deliverables

Needs Analysis Report. The Phase I Needs Analysis Report, will be the first major project deliverable. CTA will write a Phase I Needs and Analysis Report addressing the following Phase I task elements:

a. Executive Summary
b. Description of current conditions and communications needs
c. The processes and activities used to gather the necessary data and information required for the Phase I analyses
d. Results of the Group Agency Meetings including meeting records
e. Results of radio site and dispatch facility surveys including survey records
f. Results and recommendations resulting from the Task 2 Evaluation of Existing Systems
g. Results and recommendations resulting from the Task 3 Review of Radio System Documentation and FCC Licenses

We will provide the report to the EBRCS Project Manager for review. The Phase I Needs Analysis Report will include a focused executive summary, directed to the EBRCS members and management.

Phase I Presentation. We will develop and provide a formal presentation to the EBRCS management and members. Earlier in the day, CTA will preview the presentation in a workshop for the EBRCS Project Manager and staff.

Monthly Status Reports. Throughout the Phase I process, CTA will provide monthly status reports describing activities accomplished in the past month, activities scheduled for the next month, problems encountered, solutions completed, and any "red flag" items as it relates to the implementation of the project.

Project Status Meetings. CTA will facilitate status review meetings. The meeting will be held at the EBRCS location. CTA has included 2 status review meetings for Phase I.

PHASE II Analysis of Design, Schedule and Cost of Proposed System

The Analysis of Design, Schedule and Cost of Proposed System Phase begins again with the EBRCS providing CTA a Notice to Proceed (NTP) and concludes upon the delivery of final recommendations documented in the Phase II Recommendations Report. The primary goal of this phase is to create a budget estimate for the proposed system including cost to implement the complete system and recurring costs associated the system such as management, maintenance, etc. The Design Criteria & Analysis Task 1 below begins with a detailed definition of system requirements and design criteria.

Task 1 – Review of Design Criteria:

Design Criteria Analysis. Wide Area, Project 25 (P25) digital radio communications systems are complex and require a detailed design based on design criteria that reflect the needs of the owner's organization. The first task of Phase II will be to review the design criteria used in the proposed P25 radio system and microwave designs. Information gathered in the Needs Analysis will be used to help identify any changes to the design criteria required to align them with EBRCSA's current needs. The accuracy of the design criteria is critical since it forms the foundation of efforts to specify, procure, and implement a Project 25 (P25) digital radio communications system and infrastructure that meets the needs of East Bay Regional Public Safety stakeholders and first responders.

Based on CTA's 24 years of experience designing public safety radio systems, CTA's engineers will review design criteria analyses performed by Motorola and Harris Stratex pertaining to portable and mobile area coverage reliability, microwave path, end-to-end system performance, radio system expandability and growth, system availability, system redundancy and back-up power, and preventive maintenance and maintainability. The results of these reviews will be included in the Phase II Recommendations Report.

Task 2 – Proposed System Design Analysis:

Activity 2.1 – Initial P25 Field Radio Coverage Testing

Radio Coverage Testing. To develop confidence in Motorola's coverage maps, CTA will perform independent field coverage testing of one or two currently installed P25 sites in the new EBRCS. CTA will work with EBRCSA and Motorola to select up to two test sites and identify the efforts required to configure the sites for the testing. All coverage testing completed by CTA will be documented, with the results included in a "Field Coverage Test" Report.

The field coverage testing will use CTA's **Radio Coverage Evaluator** (**RaCE**SM [Patent Pending]) tool**.** **RaCE**SM [Patent Pending is an automated coverage testing facility that uses the human voice to measure the understandability of a radio signal. A series of recorded voice messages are transmitted through a radio network. Using a voice comparison algorithm, the "sent" message is compared to the "received" message, which derives a "Delivered Audio Quality" (DAQ) figure associated with the degradation introduced by the network and the propagation loss. Inclusion of signal strength recording allows determination of the effects of outside interference, such as from a cellular base station. The measurements are repeatable, tracked automatically by GPS, and calibrated by telecommunicators.

Activity 2.2 – Review of Motorola Design Details

We will conduct a comprehensive review of the radio coverage and radio traffic analyses provided by Motorola. These analyses are used to determine the site channel and antenna system requirements in the proposed system design.

Review Radio Traffic Analysis. "System Availability" includes two aspects: *Capacity* (availability of a radio channel when the user needs to talk or process mobile data), and *Coverage* (sufficient radio signal at the location

where the user needs to talk or process mobile data). Using (as required) CTA's **Capacity Analysis Model (CAM)**[SM] software with inputs derived from the Group Agency Meetings, site surveys and other existing information provided by the EBRCSA, participating agencies and Motorola, our engineers will carefully look at the user requirements to estimate the number of radio channels required. CTA's recommendations on the size of the wide-area radio communications system will be based on an acceptable *Grade of Service* projected for the busiest hour of any week.

Review Radio Coverage Analysis. Armed with the required system capacity requirements, the Motorola coverage predictions, information developed during the initial field coverage tests, site data solicited from the Group Agency meetings, and site surveys, our engineers will review the current Motorola coverage design. It is important that the coverage design is compliant with the System Design Criteria for portable and mobile radio coverage. The results of the Motorola Design Review will be included in the Phase II Recommendations Report.

Activity 2.3 – Review Site Connectivity Plan

Analysis of Harris Microwave System. Based on the Motorola radio system configuration and the current Harris Microwave system configuration, CTA's engineers will review the microwave site interconnection design and make recommendations regarding plans for the new EBRCS connectivity network. Comments and recommendations resulting from our review will be included in the Phase II Recommendations Report.

Task 4 – Project Schedule and Probable Cost Estimate:

Activity 4.1 – Develop a Phased Migration Plan

Migration and Training Planning. CTA operations specialists will develop a comprehensive migration plan for completion of the system. The plan will also include training requirements for county administrators, users, dispatch operators, and maintenance personnel.

Activity 4.2 – Develop Phased Implementation Schedule

Implementation Schedule Development. Our team is committed to schedule development and adherence. As part of our preparation to offer our consulting services to the EBRCS, we have developed a Preliminary Project Work Plan and Project Schedule. We have included in the Schedule all tasks that are necessary for the orderly implementation of any wide-area radio system project, including tasks that are our responsibility and those that are not. Tasks that are specific responsibilities of CTA, as described in our proposed services approach, are designated as such on the Project Schedule. Tasks that must be the EBRCSA's responsibility are likewise designated.

By its very nature, a project schedule is dynamic. Tasks are added and deleted, almost on an ad-hoc basis, dates are changed and tasks are registered as complete. Delays for whatever reason create schedule conflicts between participants, new dates, and possibly change orders.

CTA will work with the EBRCSA on schedule revisions, and implementation scope adjustments that can affect project costs. It is important to note that not all change orders involve additional project costs. The first place where discrepancies are generally identified is in the Project Schedule. Once the Project Work Plan and Project Scheduled are approved, CTA will maintain revision and update control of all project tasks and deliverables. CTA will examine schedule changes with the EBRCSA before a new revised schedule is issued.

It will be necessary for the EBRCSA and CTA to closely schedule this project, both internally and externally. CTA will work together with the EBRCSA to monitor project activities and potential risks, and update the Project Schedule accordingly. The Project Schedule will use our Microsoft Project scheduling software and is shown below in a PERT chart format.

Activity 4.3 –Develop Detailed Costs

Opinion of Probable Cost. CTA's proprietary Cost Budgeting Analyst[SM] software is based on a composite of actual costs experienced from recent procurements of similar systems. Our Cost Budgeting Analyst[SM] specialists have produced potential system costs that have proven quite accurate in the past, frequently with a deviation of only a few percent when compared with the actual final cost of the system under contract. CTA's Cost Budgeting Analyst[SM] specialists will provide itemized system costing results in accordance with the RFP requirements. CTA will provide the printed results in a format compatible with that required by the EBRCSA budgeting process and the RFP. CTA's Cost Budgeting Analyst[SM] specialists will also provide to the EBRCSA life cycle and replacement cost estimates, recommendations on radio user subscriber fees and potential funding alternatives, specifically addressing the ongoing cost of system operations, maintenance and the planned replacement of equipment. During the development of the Opinion of Probable System Cost, we will meet with the EBRCSA to discuss cost/benefit, design, and potential trade-offs. This will provide the EBRCSA an advanced understanding of the costs involved, and will allow us to finalize the Preliminary System Design.

Task 5 – Final Recommendations:

Phase II Recommendation Report. The Phase II Recommendation Report will be the second major project deliverable and will address the following Phase II task elements:

a. The results of the Design Criteria Reviews and analyses (Task1).
b. The results/recommendations of the Technology and Regulatory analyses (Task 2)
c. The Initial Field Coverage Test Results (Task 3)
d. The results of the Review of Motorola Design (Task3)
e. The Site Interconnection Plan Review (Task 3).
f. Site Facility analysis and recommendations (Task 3)
g. Migration Plan and Implementation Schedule (Task 4).
h. Detailed Cost Analysis (Task 4).

We will provide the report to the EBRCSA Project Manager for review. The Phase II Recommendation Report will also include a focused executive summary directed to the EBRCSA members and management.

Phase II Presentation. We will develop and provide a formal presentation to the EBRCSA management and members. Earlier in the day CTA will preview the presentation in a workshop for the EBRCSA Project Manager and staff.

Monthly Status Reports. Throughout the Phase II process, CTA will provide monthly status reports describing activities accomplished in the past month, activities scheduled for the next month, problems encountered, solutions completed, and any "red flag" items as it relates to the implementation of the project.

Project Status Meetings. CTA will facilitate status review meetings. The meeting will be held at the EBRCSA location. CTA has included 1 status review meeting for Phase II.

PHASE III Specification Writing & Procurement Support

The Specification Writing and Procurement Support Phase will be performed in parallel with Phase 2 and will conclude upon the delivery of the final Technical Specifications and RFP commercial sections. The Specification Writing and Procurement Support Phase begin with the Task 1 Project Management/Direction meeting.

Task 1 – Conduct Project Management and Direction Meeting:

Project Management/Direction Meeting. The Project Management and Direction Meeting will allow the EBRCSA and CTA project team members to review current communications technologies; frequency bands in which these technologies operate; and any interoperability issues that could result from the implementation of these current communication technologies. Sole Source Procurement planning concerns will be discussed, as well as future

project implementation, scheduling, and finalization of the Preliminary System Design into a Final System Design suitable for forming the basis of the procurement specifications. CTA anticipates that the Project Management and Direction Meeting will last two days. CTA recommends that teleconference and/or e-mail communications with the EBRCSA Project Manager and associated EBRCSA principals prior to a meeting of this type and importance helps to facilitate an effective and productive meeting.

Task 2 – Develop Technical Specifications:

Activity 2.1 – Prepare Technical Specification and Procurement Documents

Technical Specifications. CTA will develop the technical specifications portion of the procurement documentation for the remainder of the Radio System. State-of-the-art integrated wide-area radio systems are complex, and by necessity unique to each situation. Our *functional/operational* approach to specifications allows Motorola the latitude to design around its proprietary configurations, while retaining the essential attributes and operational characteristics developed specifically for the East Bay Regional Communications System and consistent with the EBRCS's Design Plan developed in Phase II.

Site Facilities Requirements. The current emphasis on Homeland Security considerations brings physical security of the radio system to the forefront of system implementation. CTA handles *system security* by carefully designing a logical and intuitive failure hierarchy into the system. In short, by including *survivability*. Equally important is incorporating *physical security* into the overall Physical Facilities specifications (buildings, towers, primary/backup power, HVAC, site security, fire protection, etc.). The Site Facilities specifications will be part of the procurement documentation.

Draft Specifications. CTA will issue the technical portion of the specifications in draft form for the EBRCSA's review and comment. The EBRCSA will be asked to provide a single consolidated list of changes or comments.

Activity 2.2 – Support for Commercial Sections of the Contract

RFP Commercial Documentation. CTA will assist the EBRCSA in reviewing and providing recommendations for the inclusion of applicable EBRCS commercial sections into the contract document.

Activity 2.3 – Develop Financing Options

Financing Options. CTA will assist the EBRCSA in developing possible financing options that can be incorporated into the contract for the purchase of infrastructure equipment.

Activity 2.4 – Develop Milestone Payment Schedule

Milestone Payment Schedule. CTA will assist the EBRCSA in developing a vendor payment schedule for inclusion in the contract pricing section. The contract pricing section will also be provided in Excel format with the expectation that the vendor will use this format to submit their system pricing and facilitate an accurate and efficient Proposal Evaluation Process.

Activity 2.5 – Develop Proposal Submittal Requirements

Proposal Submittal Requirements. CTA will assist the EBRCSA in developing the vendor proposal submittal requirements, which is probably the most essential proposal requirement that makes possible an accurate and efficient Proposal Evaluation Process.

Draft Specifications Review Meeting. The Draft Specifications Review Meeting will allow the EBRCSA and CTA project team members to review the draft specifications package, clarify any questions or concerns and approve changes/updates to the draft specification. CTA anticipates that the Draft Specifications Review Meeting will last two days.

Task 3 – Produce Technical Specifications Document - Final:

Final Specifications. CTA will revise the Draft Specifications, incorporating any EBRCSA requirements, comments, and revisions. We will provide to the EBRCSA the Procurement Package including, if requested, EBRCSA terms and conditions, commercial sections and other required procurement documentation provided to us in electronic format.

Monthly Status Reports. Throughout the Phase III process, CTA will provide monthly status reports describing activities accomplished in the past month, activities scheduled for the next month, problems encountered, solutions completed, and any "red flag" items as it relates to the implementation of the project.

Project Status Meetings. CTA will facilitate status review meetings. The meeting will be held at the EBRCSA location. CTA has included 2 status review meetings for Phase III.

PHASE IV System Procurement Assistance

The System Procurement Assistance Phase begins with the issuance of the Specification and concludes with the signing of a contract between the EBRCS and the system supplier. The first Phase IV task will be the Pre-Proposal Meeting.

Task 1 – Attend Pre-Proposal Meeting:

Pre-Proposal Meeting. CTA recommends a single Pre-Proposal meeting for a project of this size and importance, which typically lasts about two hours. CTA can chair the Meeting for the EBRCSA, prepare the meeting addenda, answer initial technical questions from the vendor, and prepare the meeting minutes.

Task 2 – Responses to Vendor's Questions:

Vendor's Proposal Questions. CTA will respond to vendor technical questions during proposal generation up to the submission of the vendor's proposal. CTA will also assist the EBRCSA with the preparation of any technical proposal addendums.

Task 3 – Additions and/or Revisions as necessary:

RFP Additions/Revisions. CTA will also assist the EBRCSA with clarifications and/or revisions to the RFP resulting from applicable written or verbal questions submitted by the vendor.

Task 4 – Attend proposal Opening:

Proposal Opening. CTA will attend the proposal opening session, which will be held at the EBRCSA designated facility.

Task 5 – Review Vendor proposals:

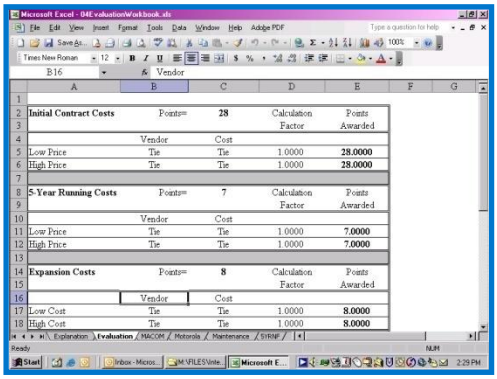
Evaluation Process. We will provide careful attention to detail and documentation throughout the evaluation process in order to mitigate the risk of protest. This process begins with the creation of a Proposal Evaluation Matrix for the vendor submission. This matrix will be used throughout the Evaluation Process to ensure all information is appropriately documented.

Technical Evaluation. We will prepare a detailed Technical Evaluation of the proposal. We will implement a multi-step evaluation process wherein our team first reviews the proposal for technical content. Then, in consensus with the EBRCSA selection committee, we will request clarifications from the vendor where required, review responses, attend an interim EBRCS evaluation meeting, attend a vendor presentation, attend a follow-up EBRCS evaluation meeting and, based upon this information, finalize our technical evaluation. We will establish

the vendor's proposal compliance according to the technical evaluation factors and present this information to the EBRCSA selection committee.

The vendor's technical information will be entered into the CTA **Proposal Variance Analyst**[SM] software to be combined with the Price Evaluation information to determine proposal variance of the vendor submission.

Price Evaluation. After completion of the Technical Evaluation, CTA will review the price proposal for technical accuracy and reasonableness – which may entail requesting additional clarifications from the vendor. The vendor's price information will be entered into the CTA proprietary **Proposal Variance Analyst**[SM] software to be combined with the Technical Evaluation information to determine proposal variance for the vendor submissions.



Initial Contract Costs	Points=	28	Calculation Factor	Points Awarded
	Vendor	Cost		
Low Price	Tie	Tie	1.0000	28.0000
High Price	Tie	Tie	1.0000	28.0000
5-Year Running Costs	Points=	7	Calculation Factor	Points Awarded
	Vendor	Cost		
Low Price	Tie	Tie	1.0000	7.0000
High Price	Tie	Tie	1.0000	7.0000
Expansion Costs	Points=	8	Calculation Factor	Points Awarded
	Vendor	Cost		
Low Cost	Tie	Tie	1.0000	8.0000
High Cost	Tie	Tie	1.0000	8.0000

Evaluation Report. CTA will document our Evaluation Process and prepare an Evaluation Report that will include technical and price evaluation results, and our recommendations regarding the responsiveness and cost effectiveness of the proposal for EBRCS.

Task 6 – Assistance during Negotiations:

Negotiate Contract Award. We will assist the EBRCS in negotiations via teleconference and in review of the contract documents. We will provide written comments to the EBRCS based upon information provided to CTA. Our negotiation effort will consist of one man-week (40 hours), in our office. If you believe additional assistance is required, we are pleased to increase this level of effort during negotiations or as additional services at the time the services are required.

Monthly Status Reports. Throughout the Phase IV process, CTA will provide monthly status reports describing activities accomplished in the past month, activities scheduled for the next month, problems encountered, solutions completed, and any "red flag" items as it relates to the implementation of the project.

Project Status Meetings. CTA will facilitate status review meetings. The meeting will be held at the EBRCSA location. CTA has included 1 status review meeting for Phase IV.

PHASE V SYSTEM IMPLEMENTATION

The System Implementation Phase entails the period beginning immediately after the signing of the contract between EBRCSA and the contracted Vendor (Contractor), and concludes with the acceptance of the project after cutover. (Note that some activities of this phase have already begun.)

Task 1 – System Implementation and Project Management Support:

Project Management Support. CTA is committed and proficient to the core processes of successful project management: project integration management, project scope management, project time management, project quality management, project communications management, project risk management, and project cost management.

Organization. The development and implementation of the East Bay Regional Communications System is a large, complex and significant project. Successful implementation by the EBRCSA will require an innovative staff comprising a combination of high technical expertise, demonstrated management capability, and a strong commitment to quality, schedule, and cost-control. We demonstrate the qualifications of our proposed Key Personnel in this proposal via our organization chart and resumes.

Plan For Ensuring High Quality Services. The secret to our success in projects of this complexity is **Communications**. Internal communications is accomplished with scheduled weekly project meetings where all participants are present either in person or by teleconference. Project communications, where key personnel work with you in regularly scheduled project meetings and/or teleconferences, all of which are carefully documented with meeting and conference records.

Project documentation, where we establish an information trail supporting decisions and agreements, including the processes and assumptions used to reach these points. Project tracking, where we track all transmittals (hard copy and electronic), all action items (yours, ours, and those of the equipment or service providers), anticipated risks (so that we can minimize or mitigate them early), all schedule items (by responsibility, so everyone is operating as a team), and all budget items (so that you have cost information at its current level). By these means, we ensure that all participants receive the high quality services needed throughout the term of the contract.

Coordination with EBRCSA representatives will be pro-active: regularly scheduled meetings and teleconferences, carefully developed project management reports scheduled to provide current information at times when you need it for your management and reporting requirements, and rapid response when you need it. We use electronic communications routinely, and we treat each communication as if it were a hard copy transmittal with a careful tracking and nomenclature procedure, filing, and, most important, the attention necessary to provide complete communications in each transmission.

Problem Resolution. Technical problems are attacked in a two-step process. In the first step, we identify and describe the problem, typically in a brainstorming session with two or more experts involved. During that session, we structure the solution process, identify several courses of action, establish the initial conditions and the desired outcome, identify and commit resources needed to handle the problem, and identify and document a schedule that will leave time for a quality review. The second step occurs after the participants have worked through the solution (or several candidate solutions), and entails a second session where the experts critique the solution or focus on one of the several candidate solutions. The lead person then documents the results.

Management and administrative problems also involve multiple step processes. Typically, the lead individual (the one who has identified the problem) meets with management personnel to identify and describe the problem. Should the situation merit it, a meeting with a broader group will follow, where we carefully and pro-actively solicit all views in an environment of open and frank discussion, and then identify and evaluate one or several solutions. Decisions are ideally made by consensus, and it is the responsibility of the lead individual to document those decisions for all involved.

We have developed a decision-making process that we call our “Impact Analysis Process”. While not strictly a problem resolution procedure, it is a formal interactive process for evaluating and ranking multiple alternatives. We first produce a “needs” list establishing what the solution is intended to address. We submit this list to the people for whom the solution is being developed, with a structured format so that they can establish the **impact** of these needs on their function. We then review the alternative solutions to establish the **ability** of each solution to respond to these needs. By use of numeric rating and weighting systems, we derive a combined assessment that produces a numerical ranking for alternatives.

Task 2 – Requirements Tracking Matrix:

Tracking Matrix. CTA will, in concurrence with the EBRCSA will develop and manage a Requirements Matrix to ensure all functional and operational system requirements are included the implementation of the contracted system.

Task 3– Preliminary Design Review:

Preliminary Design Review. A design review is an essential process wherein all members of the project team (EBRCSA, CTA, and the Contractor) are brought to the same level of understanding about the project. CTA will chair the Preliminary Design Review (PDR) meeting, developing an agenda, critically reviewing the proposed design, and keeping track of action items developed during the meeting. CTA will work with the contractor in advance to establish our expectations for the PDR. CTA expects the PDR to last two days.

Task 4– Final Design Review:

Pre-Construction Conference. This can be a separate conference or combined with the Final Design meeting. In the Pre-Construction Conference, CTA will establish the implementation ground rules and reporting structure wherein the various members of the project team will interact with each other. Schedules for review meetings and teleconferences will be consensually set, we will review Contractor submittal requirements, and we will establish a document transmittal system and processes for inspections, punch-list resolution, and approvals.

Site Construction Review. The Physical Facilities must be compatible with the radio system, and the construction schedules must be coordinated with the implementation schedules of the radio system. CTA will pro-actively review site plans, construction schedules, and site documentation, and we will inspect sites during construction on a schedule concurrent with other meetings or inspections. We will provide our comments and recommendations to the EBRCSA and the Contractor, and will establish and maintain a punch list of items (see Task 13) that must be corrected before system acceptance will be recommended.

Final Design Review. CTA will again chair the Final Design Review (FDR) meeting. CTA will develop the FDR agenda, critically reviewing the finalized design, and maintain track of action items developed during the FDR. CTA will work with the contractor in advance to establish expectations for the FDR. CTA expects the FDR to also last two days.

Task 5– Letters, Reports, White Papers:

Document Preparation. As part of CTA's Project Management support, we will assist the EBRCSA with applicable project implementation letters, reports and white papers.

FCC and FAA License Preparation. Usually at the onset of the project, the Contractor has frequently changed sites or system parameters from those established in earlier phases. CTA will provide services to prepare FCC license modifications and FAA "Notice of Construction" (also see Phase VI for a description of this work). We will coordinate this activity with the contractor.

Site Acquisition Assistance. One of the major challenges of a multiple site project implementation is Site Acquisition. Site Acquisition is probably the single leading cause of schedule delay. We recommend that this activity be expedited, and that the EBRCSA begin the process, if possible, during negotiations with the selected vendor. CTA will provide assistance and guidance via teleconference and documentation analysis.

Review Training Plans. CTA will review the Contractor's Training Plans for completeness and conformance to the specifications.

Task 6– Review and Verify Vendor Factory Orders:

Order Review. As part of CTA's Project Management support, we will assist the EBRCSA with the review of the final project equipments lists (infrastructure, subscriber radios, microwave, fiber, towers, shelters, generators, etc) for the vendor factory orders.

Task 7 – Review Vendor Invoices

Invoice Review. CTA will assist the EBRCSA with the review of vendor invoices and make payment approval recommendations.

Task 8– Review Vendor-Provided System Acceptance Test Plans:

Review Test Plans. Actual test procedures and plans are developed mutually between CTA and the vendor during implementation under test plan requirements established in the Final Specifications. CTA will review and approve these test procedures. We will begin this process during the Design Review Meetings, as testing will be part of Factory Acceptance (Staging) and will continue in the field with complementary site and system tests that exercise and demonstrate all critical functions and properties of the Implemented System.

Task 9 – Infrastructure and Mobile Installation Verification

Radio, Telecommunications and Mobile Installation Oversight. CTA will provide Advisory Oversight during the installation of the fixed Radio System and mobile radio equipment. This effort will include review meetings, inspection visits (both scheduled and unscheduled), and teleconferences as required.

Task 10 – Oversee Factory Acceptance Testing – Radio System

Radio Factory Acceptance Testing. In general, Factory Acceptance Testing or Staging is usually split between the Radio Vendor's facility and the Telecommunications (Microwave) Supplier's facility. For the EBRCS project, only Factory Acceptance Testing for the radio system is required. Radio Staging entails the set-up and interconnection of the system equipment, for testing at the radio vendor's location, prior to shipment to the project sites. Testing for each subsystem will be part of Staging. CTA will attend and critically observe these tests which should be completed in a one week time frame. We will provide a written analysis of our observations including any punch list items identified. We suggest that the EBRCSA also provide representation at staging.

Task 11 – Oversee Field Acceptance Testing

Field Acceptance Testing. We will monitor and provide general oversight for acceptance testing, which will address three systems test areas: Fixed Infrastructure, Interference, and Telecommunications Subsystem. The Contractor will perform the tests according to the acceptance test procedures established earlier. We will critically observe infrastructure system tests, and will require that the contractor spot check specific equipment tests to establish consistency with tests done previously in the factory or the shop. Field Acceptance Testing should take three weeks to complete for each simulcast sub-systems.

Test Report. The Contractor will be required to provide a formal test report that will be critically reviewed in detail by our team. We will analyze raw data supplied to us in electronic format. We will provide a written report, recommending acceptance or rejection of all or a portion of the tests.

Task 12 – Independent Coverage Acceptance Testing

Independent Coverage Acceptance Testing. CTA will provide Independent Coverage Acceptance Testing to measure the vendor's compliance with the established coverage requirements using CTA's **Radio Coverage Evaluator** (**RaCE**SM [Patent Pending]) tool**.** **RaCE**SM [Patent Pending] is an automated coverage testing facility that uses the human voice to measure the understandability of a radio signal.

Using the grades of service and coverage areas defined in the existing Motorola design, CTA will perform a DAQ test for each of the five simulcast sub-systems and any associated single site trunking systems upon completion. The purpose of each test is to serve as a final coverage acceptance test for the combined sub-system. CTA will create a test plan for the coverage testing efforts through a cooperative effort with EBRCSA and Motorola. CTA will also work with EBRCSA and Motorola through the details of each testing effort and procedures to address any disagreements between the parties in regards to the test results. All coverage testing completed by CTA will be documented, and the results reported in a "Field Coverage Test Results" report for the sub system.

Task 13 – Maintain Punch List Items

Punch List Management. CTA will maintain and manage a list of functional and installation related deficiencies. CTA will work with the EBRCSA and the Contractor to resolve these deficiencies before system acceptance is recommended.

Monthly Status Reports. Throughout Phase V, CTA will provide monthly status reports describing activities accomplished in the past month, activities scheduled for the next month, problems encountered, solutions completed, and any "red flag" items as it relates to the implementation of the project.

Project Status Meetings. CTA will facilitate status review meetings. The meetings will be held at the EBRCSA location. CTA has included 12 status review meetings for Phase V.

Task 14 – Review Record (As-Built) Drawings

Review Record (As-Built) Drawings. The project is not complete until the "paperwork is done." CTA will track Record Drawings and documentation. We will advise the Contractor of acceptable format and required content, and will provide a general review of that documentation to prove to our satisfaction that it is sufficient to enable the EBRCSA's qualified technicians or a qualified service center to maintain the system in a straightforward and competent manner.

Option – Resident Project Representative

System implementation is a demanding project phase that is best overseen by a dedicated individual for the duration of the phase. Frequently this oversight task is too large to add to the responsibilities of an organization's existing staff. CTA can offer EBRCSA the services of a Resident Project Representative to oversee system implementation and other project tasks as needed. We envision that this Project Representative would be located in an office in the Dublin EOC to work with EBRCSA on a daily basis.

PHASE VI FREQUENCY LICENSING ASSISTANCE

The licensing of new frequencies for a 700-MHz trunked radio system entails more than simply completing FCC application forms. Our proposed scope includes frequency analysis and preparation of a draft Region 6 (Northern California) 700-MHz Regional Planning Committee (RPC) application package. Since the effort proposed here can differ considerably from case to case, we are proposing a general scope of work describing elements that may be involved in the work, and a not-to-exceed (NTE) cost estimate of the total level of effort necessary in the event that all of these elements turn out to be needed as described.

Our licensing assistance will consist of the following:

1. Review Region 6 (Northern California) 700-MHz plan (the Region 6 Plan) to assess channels identified for use in the East Bay Regional Communications System Authority (EBRCSA) identified counties to support a 32- to 34-site, 97-channel system. Prepare a frequency plan, based on input from EBRCSA and its system vendor, to select the best frequencies for each site.

2. Identify RPC frequency application package requirements. Generate a list of RPC requirements that EBRCSA and its system vendor will need to provide in order to obtain approval from the RPC.

3. Interface with EBRCSA and its system vendor, as needed, to compile required documentation. Prepare draft RPC application package.

4. Prepare FCC Forms 601 and associated Schedules D and H for the 32- to 34-site system.

5. File up to six Special Temporary Authorizations (STA) and up to six STA renewals, including drafting Letter of Justification, with customer input, to support the STA filings if needed.

6. Draft, file and monitor up to six annual FCC construction notifications for the first annual notification requirement following license grants.

7. Routinely monitor FCC filings throughout the frequency coordination and licensing process.

Our scope of work is based on the following:

1. The Region 6 Plan has not yet been approved by the FCC. There is the possibility that changes may be made to the plan during the approval process. Additional work required due to these changes will be considered additional scope.

2. There is also the possibility that the United States Congress may delay the digital TV transition currently scheduled for February 17, 2009. Additional work required due to delays to the DTV transition or other congressional action will be considered additional scope.

3. EBRCSA and its system vendor will be responsible for preparing documentation for the RPC application package. This includes funding statements, engineering exhibits, slow growth plans, coverage exhibits and other items as may be required in the application package. CTA will review documentation for adequacy and suggest changes as necessary. CTA will compile documentation into the proper format for the RPC application package. CTA will prepare FCC Forms 601 and associated Schedules D and H based on information provided by EBRCSA and its system vendor.

4. EBRCSA will submit the RPC application package to the Region 6 RPC and will attend Region 6 RPC meetings to support the applications. CTA will assist EBRCSA in responding to questions from the RPC, the frequency coordinator and the FCC to clarify any technical issues arising from their review of the applications.

5. STAs beyond the six quoted will be considered additional scope.

6. Waiver requests will be considered additional scope.

7. Legal services will be considered additional scope.

8. Frequency searches, engineering analyses, applications and any other work associated with licensing 800-MHz interleaved frequencies will be considered additional scope.

BASIS OF CTA PROPOSAL

In order to control and reduce costs, CTA proposes a well-defined scope of work and responsibility for our Team and the EBRCSA Project Team. Our scope of work and professional fees are based on the following:

OWNER CONSIDERATIONS:

1. The EBRCS project support as listed in RFP Section II, subsection F.

2. The EBRCSA will provide review and approval of submittals and draft reports according to the proposed schedule, and respond with consolidated comments.

CTA CONSIDERATIONS:

1. Specifications developed by CTA will be provided to the EBRCSA in hard copy and .PDF form for internal and external distribution. While portions of the specifications may be provided to the EBRCSA in modifiable electronic format, for the convenience of the project and at the option of CTA, such files are for EBRCSA internal use only, and may be distributed outside the EBRCSA only with CTA permission and with the inclusion of CTA restrictions on the use of such files. We note that this is a liability issue for CTA.

2. Our scope and professional fees are based on sufficient review and information gathering meetings in Alameda and Contra Costa Counties to obtain the necessary information and make the necessary decisions pertaining to the project. CTA estimates the following visits and hours will be sufficient for the project, and has based project approach accordingly:

		Visits	CTA Team (people)
Phase I	**Needs Analysis - Complete**		
	Kickoff/Planning Meeting	1	2
	Initialization Meeting	1	2
	Group Agency Meetings	1	2
	Site Surveys	1	2
	Dispatch Facility Surveys	1	2
	Project Status Meetings	2	2
	Phase I Presentation	1	2
Phase II	**Design Criteria & Analysis Review of P25 System Design**		
	Field Radio Coverage Testing	2	2
	Cost Benefit Meeting	1	2
	Project Status Meetings	1	1
	Phase II Presentation	1	1
Phase III	**Specification Writing & Procurement Support**		
	PM & Direction Meeting	1	2
	Draft Specification Meeting	1	2
	Project Status Meetings	2	2

		Visits	CTA Team (people)
Phase IV	**System Procurement Assistance**		
	Pre-Proposal Meeting	1	2
	Proposal Opening Meeting	1	1
	Interim Proposal Evaluation Meeting	1	1
	Follow-up Proposal Evaluation Meeting (Optional)		
	Project Status Meetings	1	2
Phase V	**System Implementation**		
	Preliminary Design Review Meeting	1	2
	Final Design Review Meeting	1	2
	Factory Acceptance Tests	1	1
	Field Acceptance Tests (Sites)	2	1
	Field Acceptance Tests (Dispatch)	2	1
	Pre-Construction Conference	1	2
	Installation Inspections (Sites)	2	1
	Installation Inspections (Dispatch)	2	1
	Project Status Meetings	12	2
Phase VI	**FREQUENCY LICENSING ASSISTANCE**		
	Region 6 Planning Committee Meeting Presentation	2	1

3. Digital communication and the use of computer software.

CTA uses the following office software:
Microsoft Word 2003
Microsoft Excel 2003
Microsoft Access 2003
Microsoft PowerPoint 2003
Microsoft Project 2003
AutoCAD 2006
Process Continuum
Adobe Acrobat 7.0 Standard

It is possible to provide documentation produced by our computer systems in other electronic formats. Such files will typically be provided as export files. In such cases, the controlling documentation will be a hard copy. CTA cannot be held responsible for the effects of exporting files to the formats of the other computer systems, which might result in format, reference, or calculation errors.

While e-mail is essential in intercommunicating between individuals working on a project on a day-to-day basis, we consider that such use is essentially conversational and, therefore, decisions made and business transacted must be ratified and confirmed by the lead personnel and project managers for the EBRCSA and for CTA. Since e-mail files can be modified at any stage of the process, they do not provide an effective paper trail, and we do not consider that they should be used in lieu of a careful documentation process.

E-mail is also useful in conveying documents and deliverables in electronic format, and, for this purpose, we suggest that a formal transmittal system be in place in order to track and document such conveyances.

Revised Fee
2/10/2009

DESCRIPTION OF SERVICES	(a) Fixed Cost Unit of Measure	COST*
Section 1: Needs Analysis- Inclusive of all items stated under Phase I	One Lot **COMPLETE**	$289,184.00
Section 2: Analysis of Design, Schedule and Cost of Proposed System; Specification Writing/Procurement Support - Inclusive of all items stated under Phases II & III.	One Lot	$381,326.00
Section 2: System Procurement- Inclusive of all items stated under Phase IV.	One Lot	$180,920.00
Section 3: System Implementation/Project Management – Inclusive of all items stated under Phase V.	One Lot	$672,934.00
Grand Total (Sections 1 through 3)		$1,524,364.00 *(Includes travel time, mileage, per diem)
Frequency Licensing Assistance – Phase 6	Time and Material Project: Not to Exceed	$43,209.00
Independent Coverage Acceptance Testing	One Lot	$359,059.00

Additional Consulting Services requested beyond the scope of work "as needed". Quote hourly rate(s) according to published fee schedule.	**(b) Cost for Services Unit of Measure**	
Project Executive	Hourly	$250.00/hour
Project Manager – Subject Matter Expert	Hourly	$225.00/hour
Project Manager	Hourly	$199.00/hour
Senior Communications Engineer	Hourly	$195.00/hour
Senior Operations Specialist	Hourly	$170.00/hour
Lead Communications Engineer	Hourly	$164.00/hour
Communications Specialist– Subject Matter Expert	Hourly	$155.00/hour
Senior Communications Specialist	Hourly	$135.00/hour
Staff Communications Engineer	Hourly	$132.00/hour
Project Coordinator	Hourly	$117.00/hour
Communications Specialist	Hourly	$100.00/hour
Project Administrator	Hourly	$85.00/hour
Clerical	Hourly	$50.00/hour
** All hourly rates are quoted according to our published fee schedule and do not include travel time and mileage.		