CLACKAMAS
800 RADIO
GROUP

11300 SE Fuller Rd
Milwaukie, Oregon 97222
(503) 780-4806
C800.ORG

C800 COMMUNICATION SYSTEM UPGRADE PROJECT

CITIZEN ACCOUNTABILITY COMMITTEE
MEETING MINUTES – NOVEMBER 30, 2016

Meeting to be held at: Clackamas Fire District #1 Mt. Scott (Station 5)
9339Causey Ave Happy Valley, OR 97086

1. The meeting was called to order at 6:45pm by Chief Fred Charlton – C800 Chair and the following were in attendance:

Dave Austin – Lake Oswego
Chris Hawes – Damascus
Renee King – Clackamas
Jacqueline Mansfield – Sandy
Bill Merchant - Beavercreek
Kirk Stempel – Gladstone
Laurie Freeman Swanson – Molalla

Chief Bob Morrisey – Estacada Fire
Chief Jim Band – Oregon City Police
Laurel Butman – Clackamas County

Chief Fred Charlton – CCFD#1 / Chair C800
Capt James Rhodes – CCSO / Vice Chair C800

John Hartsock – Manager C800

2. Chief Charlton welcomed all, thanked the members for their willingness to participate and assist in the project. Secondly, he provided a history of C800 and its mission to operate and manage the public safety radio system within Clackamas County.
3. John Hartsock asked all to introduce themselves providing a little personal history as well as a brief explanation of their interest in being on the committee.
4. An overview of the project including why the project was happening, the project goals, the project definition, and the key elements. Also provided were overall radio coverage maps depicting the current radio coverage and the projected new coverage. It was noted that the Committee would be provided with numerous documents at the meeting (outlined below) for information and reference.
5. The Committee Charter was reviewed covering the roles and responsibilities for the Committee.
6. A copy of the Intergovernmental Agreement (IGA) between the County and C800 was provided. It was pointed out that the agreement specifically calls on the Citizen's Accountability Committee to play an active role in reviewing and reporting on project status.
7. The Project Plan, which outlines Project Scope / Budget / Schedule, is a requirement of the IGA with the County. A copy was provided and briefly reviewed to inform the Committee.
8. There was discussion on the procurement plan for the project. It was stated that approximately 50% of the project would be competitively bid either through Invitations to Bid process (contract award based on cost alone) or a Request for Proposal process (contract award based on multiple factors including cost), . It was discussed that it is currently contemplated that the radio system portion will follow a Request for Qualifications process and if multiple vendors are

qualified then a Request for Proposal will be issued. If only one vendor is qualified, then a sole source procurement will be made.

The Committee was provided a report concerning the potential use of a sole source procurement with Motorola for the radio portion of the system. This report outlined the history and rational for this consideration. The initial reaction by the Committee was supportive for this strategy. The Committee was requested to review this information in more depth and that there would be further information and discussion and a request for their input prior to the C800 Board finalizing this decision. It was requested that there be a clear summary of system features between the potential vendors.

9. A draft project Status document was provided for review and comment. It was explained that this would be generated and distributed monthly to communicate project status.
10. It was discussed that the next meeting would be scheduled in March of 2017 and that we would be varying the location. Secondly it was stated that we would be providing them information or meeting on the radio procurement question prior to the next meeting.
11. John Hartsock thank the Committee for their interest, questions, and willingness to serve. The meeting was adjourned at approximately 8:45pm

Attachments:

A. Project Definition
B. Map Existing Radio Coverage
C. Map Projected Mobile Radio Coverage
D. Map Projected Portable Radio Coverage
E. Citizen Accountability Committee Charter
F. C800 / Clackamas County IGA
G. Project Plan
H. WCCCA/C800 Proposed System Replacement Plan
I. Draft Project Status Report

CLACKAMAS
800 RADIO
GROUP

11300 SE Fuller Rd
Milwaukie, Oregon 97222
(503) 780-4806

CLACKAMAS COUNTY EMERGENCY RADIO SYSTEM REPLACEMENT PROJECT

ATTACHMENT – A / PROJECT DEFINITION

September 28, 2015

Why does the Emergency Communication System need replacing?

1. *The existing emergency radio system is out dated and prone to failure*
2. *Need to transition to current open source digital technology*
3. *Need to ensure ongoing system compatibility and interoperability*
4. *Need to expand coverage to underserved and unserved populated areas*
5. *Need to respond to population growth*

Project Goals

- Timely replacement of Clackamas County's emergency radio/data infrastructure to ensure continuous service to meet first responder needs
- Maintain a system that is based on current open source digital technology and ensures compatibility and interoperability into the future
- Maintain or enhance existing service levels
- Develop a capital financing strategy that minimizes the financial burden on user agencies and reinforces public trust and confidence
- Provide fiscal and schedule oversight through a Citizen Oversight Committee in addition to the C800 Board of Directors
- This project is the reasonable way to save lives and fix the problem, creating an efficient, dependable communications system that works in all parts of Clackamas County

Project Definition

This project will construct a new P25 open source digital emergency radio system covering Clackamas County. The new system will provide equal coverage and performance to the current system while also expanding coverage and maintaining interoperability. The system will include but not be limited to:

- ✓ 800MHz two-way radio infrastructure at radio sites and master site equipment
- ✓ A microwave transport system
- ✓ Fourteen additional sites including buildings, towers, DC power systems, backup generators:
  - 5 sites to make up for the performance difference between analog and digital;
  - 6 sites for expanded coverage in the Mt Hood/Hwy 26 area and the Clackamas drainage in South County;
  - 1 site for the portable at the hip coverage;
  - 2 sites for enhanced in-building coverage;

- ✓ Application to allow SMART phone access to the system;
- ✓ Paging system replacement;
- ✓ Post-warranty support;
- ✓ Systems refresh for equipment and software upgrades
- ✓ Project management
- ✓ Dispatch Back Up
- ✓ Includes 50% of mobile and portable radios – the balance remains an agency responsibility.

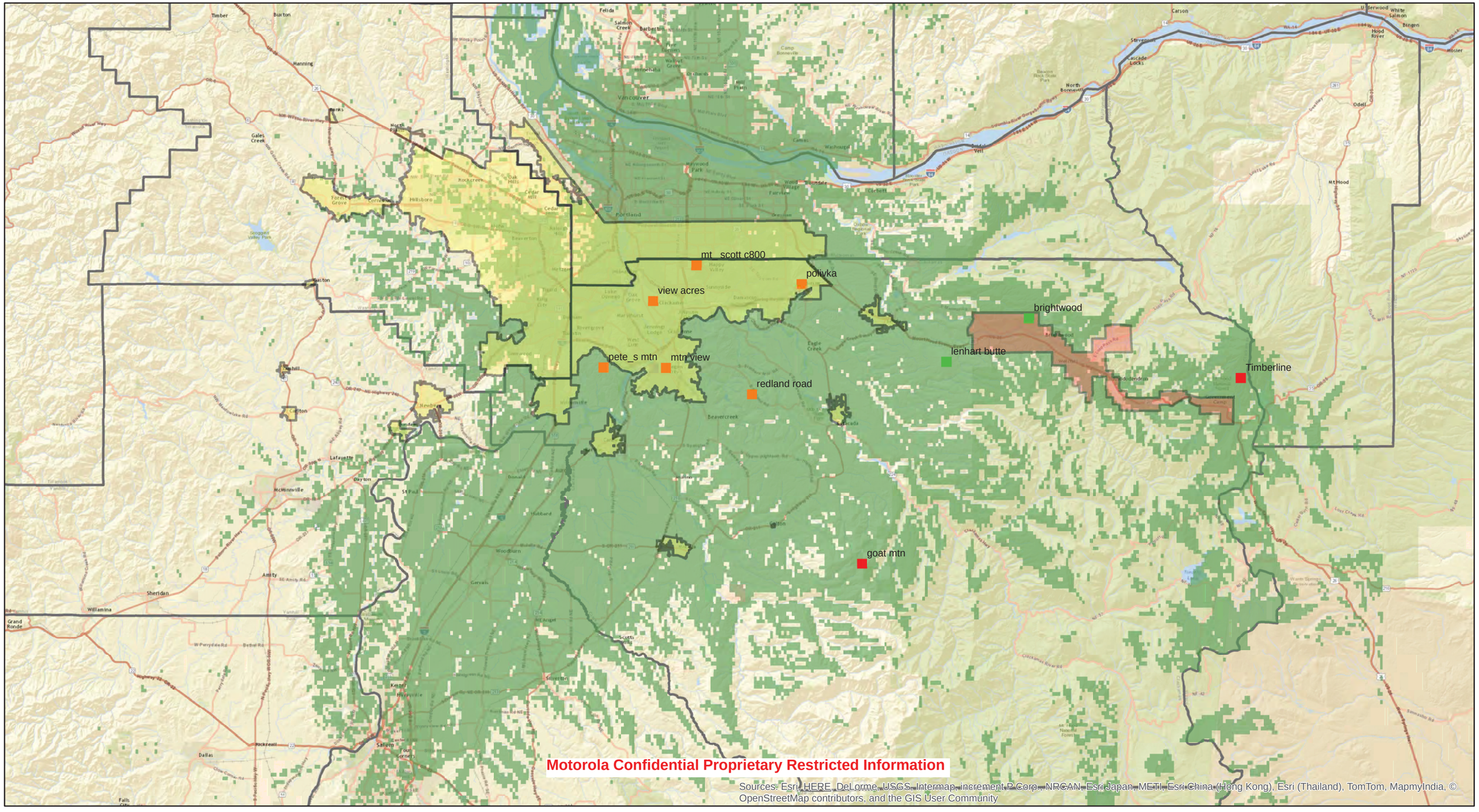
Project Elements

The project also includes costs for:

- ✓ Site acquisition consulting services
- ✓ Architectural, engineering, geotechnical investigation, and other required professional services
- ✓ Land use and construction permits expenses
- ✓ Other Governmental fees
- ✓ Land acquisition through purchase and/or lease
- ✓ Reimbursement of costs incurred for the project prior to bond issuance
- ✓ Bond issuance cost and expenses

WCCCA/C800 LMR System

C800 Existing Trunked Analog System



0 4 8 16 Miles

1 inch = 6.67 miles

Projection: World_Mercator

97% Reliability_DAQ 3.0_Portable @ Head

Run_2_C800 SA Analog

John Scherner

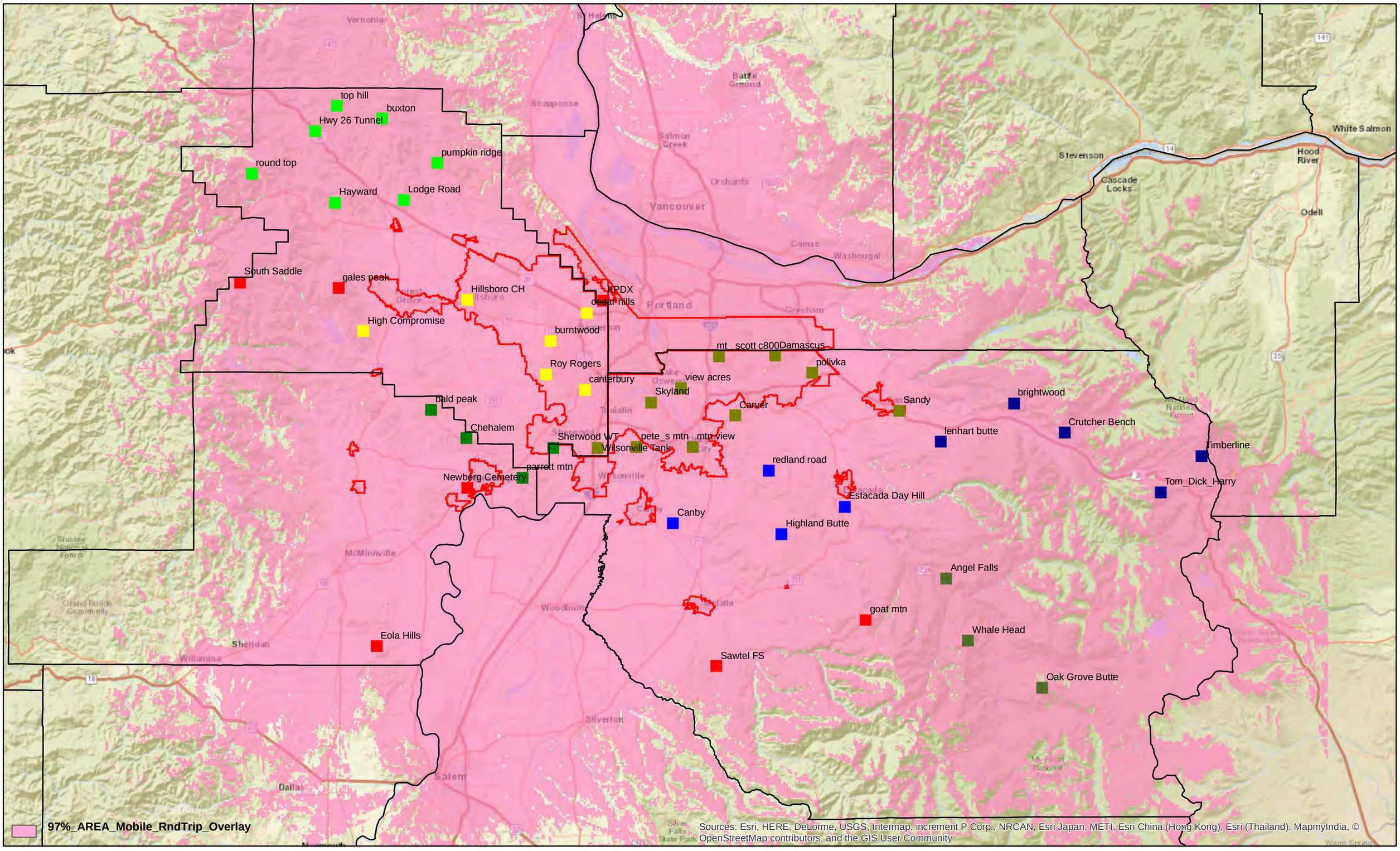
Feb 04, 2015 Hydra 4.5.3048.0

453416117.10.000.1.2

MOTOROLA

WCCCA/C800 LMR System

97% Round Trip Reliability_DAQ 3.4



0 4.5 9 18 Miles

1 inch = 7.34 miles

Projection: World_Mercator

System-Wide Mobile On Trunk Coverage
APX 7500 Mobile 10W
3db Elevated Feed Antenna

Run_6_Mobile Covg_trunk_mount
Based on 4_1 Site Data

April Filiczkowski

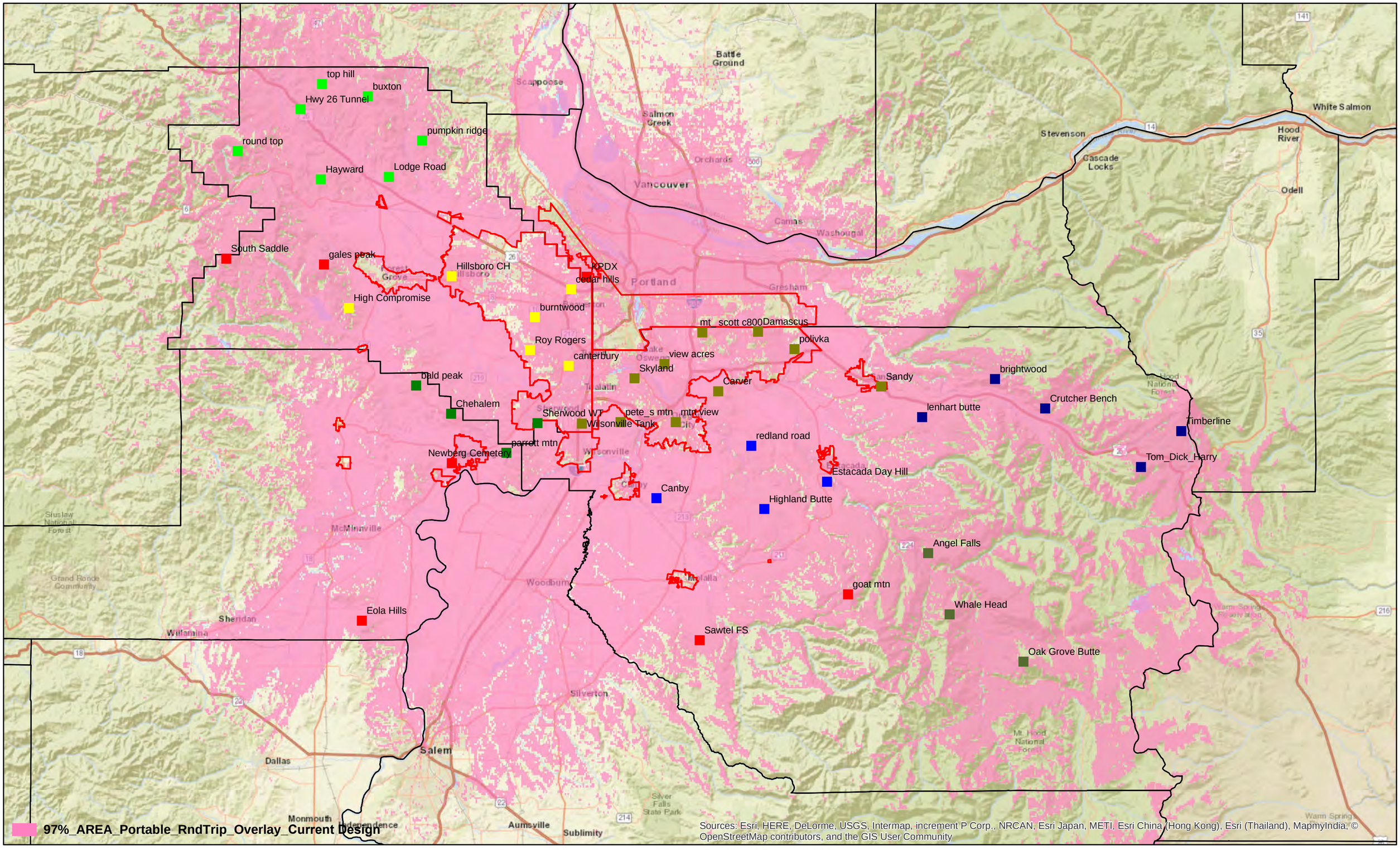
Apr 15, 2016 Hydra 4.5.3048.0

139213252.46.000.2.6

MOTOROLA

WCCCA/C800 LMR System

97% Round Trip Reliability_DAQ 3.4



0 4.5 9 18 Miles

1 inch = 7.39 miles

Projection: World_Mercator

Apr 13, 2016

Hydra 4.5.3048.0

System-Wide Coverage TX/RX On-Hip 15db in UGB
APX 6000 Portable 3W 1/2 Wave Whip
Clip Swivel with Corded Speaker Mic

Run_47_Port_On_Hip_15db_In_UGB_R161_Clip_Swivel_NEW

April Filiczkowski

984411297.46.000.2.47

CLACKAMAS
800 RADIO
GROUP

11300 SE Fuller Rd
Milwaukie, Oregon 97222
(503) 780-4806

COMMUNICATION SYSTEM UPGRADE PROJECT

Citizen Accountability Committee Charter

May 23, 2016

The Clackamas County Board of Commissioners on behalf of Clackamas 800 Radio Group (C800) referred a Capital Construction Bond Measure to a successful May 2016 election. (Attached) As required by the ballot explanatory statement, the C800 Board of Directors hereby establishes a Citizen Accountability Committee ("Committee") to assist in monitoring the progress of the Communication System Upgrade Project ("Project").

The C800 Board has overall responsibility to ensure the Project is executed within the parameters of the law and meets the commitments made to the community.

The C800 Manager has responsibility for the implementation of the Project.

1. Committee Charge:
The Committee's responsibility is to monitor and report to the C800 Board of Directors on the progress of the Project relative to the following objectives.

- **a.** The Committee will receive and review quarterly Project performance and financial reports, to assess that the bond proceeds are being expended in general compliance with the purposes set forth in Clackamas County Measure 3-476. Further the Committee has the option to inspect facilities related to Project when coordinated with C800 staff;
- **b.** That the Project is in alignment with the Project Goals approved by the C800 Board of Directors (attached hereto) and relevant C800 policies;
- **c.** Communicating key findings related to the Project to the C800 Board of Directors and the Clackamas County Board of Commissioners;
- **d.** The Committee will perform other reasonable duties as requested by the C800 Board of Directors.

2. Committee Membership:
The Committee shall consist of nine members as selected by the C800 Board of Directors. The Committee members will elect a committee chair. The C800 Board of Directors seeks individuals with a good reputation in the community for fairness and transparency. Committee membership will strive to reflect a combination of experience in: finance; public contracting, budgeting, and/or auditing; public safety communications.

- **a.** The Committee members shall receive no direct or indirect compensation from C800 for their services as members of the Committee.
- **b.** Neither the Committee members, their business associates nor immediate family members may have an active or pending contract with C800, nor enter into a contract during their term on the Committee. Should a conflict arise, it is the responsibility of the member to publicly announce such a conflict. The C800 Board of Directors will determine if the member should step down from the Committee.
- **c.** The Committee may not include any employee or official of C800, or any vendor, contractor or consultant of C800.
- **d.** A Committee member serves to advise the C800 Manager and C800 Board of Directors. If a Committee member resigns, violates the Ethics Policy contained herein, fails to attend two consecutive Committee meetings without being excused, or otherwise becomes unable to serve on the Committee, the C800 Board of Directed may declare the position on the Committee to be vacant and appoint another qualified person to the Committee.

e. The Committee members serve at the pleasure of the C800 Board of Directors

3. Committee Meetings:

a. The Committee will meet quarterly or as requested by the C800 Board of Directors.

b. Committee meetings are advisory and do not constitute decision-making by the C800 Board of Directors.

c. The Committee, being advisory to the C800 Board of Directors, shall comply with the Oregon Public Meeting laws. The meetings shall be publicly noticed and include opportunity for public comments.

d. The Committee Chair will draft and submit a quarterly report to the C800 Board of Directors within two weeks of each committee meeting. The report will represent a consensus of committee members. The C800 Board may request reporting at a regular C800 Board Meeting.

e. C800 staff will provide necessary technical and administrative assistance as follows:

i. A meeting room, including any necessary audio/visual equipment;

ii. Preparation and copies of any documentary meeting materials, such as agendas and reports; and distribution (softcopy preferred) of those materials to the committee in a timely manner.

iii. Quarterly reports covering the project program.

iv. Preparation of committee meeting minutes and posting for public viewing on the C800 web site.

v. District staff will attend committee meetings in order to report on the status of capital improvement projects, respond to questions, and receive advice and counsel on the overall bond program or any of its component parts. District consultants may participate in committee meetings at the discretion of staff.

4. Committee Responsibilities Exclude:

a. Approval of the sale of bonds;

b. Appropriation of construction funds;

c. Selection of architects, engineers, construction managers, project managers, and such other professional service firms;

d. Approval of the design for any project including construction plans and schedules;

e. Approval of construction contracts and/or change orders;

f. Handling of legal matters;

g. The selection of independent audit firm(s), performance audit consultants and such other consultants as are necessary to support the performance of the bond program;

h. Activities, roles or responsibilities that have been designated by the C800 Board of Directors or the C800 Manager, nor any policy-making responsibilities.

5. Ethics Considerations:

This ethics policy provides general guidelines for Committee members to follow in carrying out their duties. Not all ethical issues that Committee members face are covered in this policy. However, this policy captures some of the critical areas that help define ethical and professional conduct for Committee members. Committee members are expected to strictly adhere to the provisions of this ethics policy.

CONFLICT OF INTEREST. A Committee member shall not attempt to influence a C800 decision related to: any contract funded by bond proceeds; or any construction project which will benefit the committee member's outside employment, business, or provide a financial benefit to a family member, such as a spouse, child, parent or sibling.

OUTSIDE EMPLOYMENT. A Committee member shall not use his or her position on the Committee to negotiate future employment with any person or organization that relates to: any contract funded by bond proceeds; or any construction project. A Committee member shall not attempt to influence a C800 decision

related to any construction project involving the interest of a person with whom the member has an agreement concerning current or future employment, or remuneration of any kind.

CONTINUING RESTRICTIONS. For a period of one (1) year after leaving the Committee, a former Committee member may not represent any person or organization for compensation in connection with any matter pending before C800 that, as a Committee member, he or she participated in personally and substantially. Specifically, for a period of one (1) year after leaving the Committee, a former Committee member and the companies and businesses for which the member works shall be prohibited from contracting with C800 with respect to: bidding or proposing to provide services on projects funded by the bond proceeds; or any construction project funded by C800.

COMMITMENT TO UPHOLD LAW. A Committee member shall uphold the United States and Oregon Constitutions, the laws and regulations of the United States and the State of Oregon, and the policies, procedures, rules and regulations of the Clackamas 800 Radio Group.

COMMITMENT TO THE PUBLIC. A Committee member shall represent the interests of the public and not the personal or business interests of the member.

Clackamas County Measure 3-476

BALLOT TITLE GENERAL OBLIGATION BONDS TO REPLACE OBSOLETE EMERGENCY RADIO COMMUNICATIONS SYSTEM

QUESTION: Shall County replace obsolete first responder's emergency radio communications system; expand coverage; reinforce for disasters; issue $59 million in bonds? If the bonds are approved, they will be payable from taxes on property or property ownership that are not subject to the limits of sections 11 and 11b, Article XI of the Oregon Constitution.

SUMMARY: When the public calls 9-1-1 for help, Clackamas County's emergency communications system dispatches all fire and rescue, law enforcement, and ambulance providers countywide. Although the system has worked for decades, manufacturers no longer make key parts and towers are not designed to withstand the earthquakes predicted for Oregon.

If approved, bonds will pay for replacement of the emergency communications system including:

*Convert the emergency radio system to current technology;

*Expand coverage to county areas that currently have none;

*Add in-building coverage, so radios can function within hospitals, schools;

*Improve reliability during major disasters;

*Replace approximately 1000 analog radios countywide; and

*Purchase land, repay debt

For accountability, a citizen committee will provide oversight.

Bonds would be paid over 15 years or less.

Projected tax rate for bonds is estimated not to exceed 10¢ per $1,000 of assessed value. Actual rate may vary depending on market conditions.

Typical homeowners with a 2016 average assessed (not market) value of $262,514 would pay about $26.25 annually or a little over $2 a month.

EXPLANATORY STATEMENT

The existing emergency radio communications system for Clackamas County was built in the 1990s as a multi-agency effort to ensure emergency responders, including fire, law enforcement, and ambulance providers, could quickly and safely respond to emergencies.

Who uses the emergency communications system?

When a call for help is made to 9-1-1, the emergency radio system enables dispatchers to get all necessary emergency responders to the caller's location as quickly as possible. The system also provides the vital link among responders in the field to coordinate, request backup and get aid to people in crisis. The system is used by fire and rescue, city police, the County Sheriff, and EMS/ ambulance responders countywide. The system is run by the Clackamas 800 Radio Group (C800), a partnership of public safety agencies.

Why does the system need to be updated?

Four key issues prompt the need for the system upgrades contemplated by the bond:

• *Changes in Emergency Communications Technology* - Equipment for the current system is obsolete and reaching the end of its serviceable life. Manufacturers no longer make key replacement parts because they have transitioned to newer technology, and finding used parts for the system has become increasingly difficult.

• *Growing Demand for Emergency Services* - Population and emergency call volume have grown and are anticipated to increase further over the coming decades. Up-to-date equipment is necessary to ensure that the system remains effective.

• *System Coverage* - The existing system has limited or no coverage in rural areas including Mt. Hood, the Clackamas River drainage, and portions of South County. The existing system also has limited functioning and coverage within large buildings such as schools, hospitals, and commercial structures. Purchasing additional sites, adding towers, and expanding coverage inside buildings will increase system availability.

• *Need to Improve Reliability During Major Disasters* - The system must be designed, built and maintained to a much higher standard than consumer telecommunications so it can work reliably during a storm, earthquake, or other major emergency, even if land line or cell phone networks overload or fail. Updated equipment and strengthened facilities will improve reliability of the system during severe weather, major earthquakes, and other disasters.

How much would the system improvements cost?
The proposal would raise an estimated $59 million for capital improvements, equipment upgrades, and replacement of over 1,000 analog radios currently used by first responders countywide. These funds would be generated through the County's issuance of general obligation bonds that are expected to be paid over 15 years or less.

How much would this measure cost property taxpayers? The projected levy rate is estimated to be approximately 10¢ per $1,000 of assessed value. Actual rate may vary depending on changes in bond interest rates and assessed values. This rate would be levied over 15 years or less. A typical homeowner would pay about $26.25 in 2016 or a little over $2 a month assuming an average assessed (not market) value of $262,514.

Attachment 3

DRAFT

INTERGOVERNMENTAL AGREEMENT
Clackamas County Public Safety Radio System Replacement Project Bond Funding

THIS AGREEMENT (Agreement) is made and entered into pursuant to Oregon Revised Statutes (ORS) 190.010, by and between Clackamas 800 Radio Group (C800), an intergovernmental entity formed and authorized by ORS chapter 190, and Clackamas County (County), a political subdivision of the State of Oregon. This Agreement shall be effective upon signing by both parties and shall continue through the life of the Public Safety Radio System Replacement General Obligation bond or the life of any refunding of same, whichever is later.

The Agreement defines the respective roles and responsibilities of the County and C800 with respect to the Public Safety Radio System Replacement Project and any subsequent activities related to the bond funding as defined below. As the entity responsible for the bond funding, the County will retain management control and oversight of all bond related expenditures and compliance with laws, policies, debt covenants, and procedures, and C800 covenants to comply with the same.

RECITALS

WHEREAS, C800 owns and operates the public safety 800 MHz trunked radio system (Radio System) serving emergency responders of the County; and

WHEREAS, C800 has determined that the Radio System needs to be replaced and expanded; and

WHEREAS, C800 has developed a plan and budget for the Public Safety Radio System Replacement Project (Project), and needed to obtain a source of funding for the Project; and

WHEREAS, an ORS 190 entity is not authorized to issue general obligation bonds; and

WHEREAS, the County placed a successful measure on the May 2016 ballot for the purpose of supporting the Project, obtaining voter approval to issue up to $59 million in general obligation bonds; and

WHEREAS, the Project includes covering all costs and expenses relating thereto, including but not limited to financing costs; and

WHEREAS, the parties desire to establish responsibilities for and appropriate uses of the bond proceeds;

NOW, THEREFORE, C800 and the County hereby agree as follows:

AGREEMENT

1. Scope of Work

Project Description: Once completed, the Project will replace and enhance the current county-wide two-way 800MHz radio system. The Project will generally include refurbishing existing and adding new radio sites, communication towers, communications buildings, conventional and emergency power systems, infrastructure radio equipment or base station radios and controllers, dispatch

console systems, antenna systems, microwave communication links between sites, and associated or required accessories and related equipment. The Project also includes an allowance for helping agencies purchase subscriber radio equipment, such as portable, mobile, and/or control station radios as needed by the personnel of the individual agencies comprising C800 to utilize the system. This allowance shall be allocated by the C800 Board on an equitable basis between partner and member agencies. Any additional cost for subscriber radio equipment will be the sole responsibility of the partner and/or member agency.

Project Timeline and Cost. Construction is anticipated to be completed with the radio system in service by the end of June 2019. The cost of the Project is projected not to exceed $59,000,000, including financing-related costs. The County certifies that it has $53,155,000 in non-taxable bond and $5,845,000 in taxable bond proceeds available for the project. If these bond proceeds are exhausted, any remaining projects costs are the sole responsibility of C800.

Additionally, premiums yielded by the bond sale exceed the $59 million estimated Project cost as published in the ballot measure and will be held as contingency in reserve by the County until such a time as the Board of County Commissioners (BCC) determines their future use If not needed as contingency for the Project. This contingency funding will only be made available for uses of the proceeds consistent with the scope of the May 2016 ballot measure, including unforeseen project cost increases beyond the control of C800 and will only be released at the sole discretion of the BCC. The County will solicit advisory input on these matters from C800 and the Citizen Accountability Committee.

2. Roles and Responsibilities

The County's role is to provide overall oversight and fiscal administration of the bonds. C800's role is to provide responsible project management of the public safety radio system upgrade and radio replacement elements through its Board and assigned staff representatives.

County Responsibilities:

a) Assign a County Lead Project Manager to the project, initially the Deputy County Administrator (County Lead).
b) Implement bond issuance(s) and disclosures; debt may be issued in multiple series.
c) Invest the bonds in accordance with the County's investment policy.
d) Provide oversight, compliance, and accountability related to the expenditure of bond proceeds.
e) Provide overall fiscal management, tracking and reporting financial and procurement compliance requirements.
f) Collaborate with assigned C800 staff regarding the management of the replacement/upgrade of the public safety radio system.
g) Review and comment on or approve procurement project scopes and all change orders and scope modifications pursuant to Section 7 of this Agreement.
h) Review and approve eligible reimbursement requests and maintain project files for at least the term of any bond funding (including refunding bonds) plus three (3) years.
i) Make approved disbursement of bond proceeds to C800 for eligible expenses.

<u>C800 Responsibilities:</u>

a) Comply with all bond requirements and County processes and procedures.
b) Develop a comprehensive project plan, scope, calendar and cost estimates.
c) Ensure County-approved C800 procurement rules (as attached hereto as Exhibit B) are followed for all elements of the project plan and obtain County approval for changes or variances from standard procurement processes, as more fully described in Section 4 below.

d) Present change orders and/or scope modifications to the County for consideration and prior approval related to the public safety radio system project pursuant to Section 7 of this Agreement.
e) Review and submit copies of all invoices with reimbursement requests.
f) Provide Project management and interface directly with County Lead.
g) Maintain project files, including copies of all invoices and contracts related to the project, for at least the term of any bond funding (including refunding bonds) plus three years.
h) Maintain and insure project assets in compliance with Section 13 of this Agreement.
i) Appoint a County representative to sit on the Project Citizen Accountability Committee.

The County and C800 recognize the importance of this Project and will commit the necessary staff resources to ensure its success. C800 acknowledges that the bond proceeds will be the sole capital contribution from the County for the Project.

3. Project Plan

C800 will develop a comprehensive Project Plan that includes detailed scope, deliverables, cost, and timelines for all elements of the Project. Once approved by the County, the plan and any subsequent amendments thereto shall automatically and without need of further action replace Exhibit A to this Agreement. The County shall not be obligated to disburse funds under Section 5 until an initial Project Plan consistent with this Section is completed.

4. Procurement Process

All vendors and suppliers will be selected through the County-approved C800 purchasing rules and regulations as attached in Exhibit B (C800 LCRB Rules) and the applicable provisions of state law, including but not limited to ORS Chapters 279A, 279B, and 279C. Any changes to the C800 LCRB Rules must be preapproved by the County.

5. Bond Disbursement

Requests by C800 for bond disbursement to reimburse Project expenses that are within the agreed upon scope, cost, and timeline of the Project require joint approval by the County Lead and Finance Director. The County will disburse bond funds when the following requirements are met:

(a) Bond Compliance: Requests are for items confirmed to be within the project scope preapproved by the County. The costs must be eligible expenditures under the bond covenants. Non-capital (operating) costs will only be covered to the extent that there are taxable bond proceeds available to reimburse these expenditures.
(b) Performance: C800 has demonstrated timely delivery, receipt, or provision of approved goods or services to the County's satisfaction.
(c) Reimbursement Requirements: C800 has followed the reimbursement requirements outlined in Section 6 of this Agreement.
(d) Change Orders: C800 has followed the change order requirements outlined in Section 7 of this Agreement.

6. Reimbursement Requests; Approval Process

C800 shall make Reimbursement Requests for expenditures for the Project using a completed Reimbursement Request Form accompanied by a brief narrative about the expenditures, invoice(s), receiving document(s), and proof of payment. C800 will submit reimbursement requests to the County Lead via mail or email no more than once monthly, but not less than quarterly. Requests are due no later than fifteen (15) days after the month or quarter ending.

Reimbursement Requests will be reviewed to ensure compliance with bond requirements. Expenditures will be deemed either eligible or ineligible for reimbursement. Additional documentation maybe requested. The County Lead and County Finance Director must jointly approve any

reimbursement request before bond funding will be disbursed. Once approved, the County Finance Department will process the disbursement of applicable bond funds to C800 through their normal accounts payable process.

7. Change Orders

C800 will promptly notify the County of any proposed change orders and disputes with contractors or subcontractors. C800 will present any change orders that deviate from the agreed upon project scope, cost, or timeline to the County Lead for consideration and approval. The County Lead will forward any major changes will be forwarded to the County Board of for consideration and approval. A “major change” is defined as: a) any cost change in excess of $150,000; or b) change in scope, cost, or timeline referred to the Board of County Commissioners by the Citizen Accountability Committee.

6. Audit; Financial Controls

In its annual audit, C800 shall include a review of the Project accounting and financial controls, and shall provide the County with a copy of the annual audit report, no later than thirty (30) days after the completion of the audit. C800 shall provide interim unaudited financial reports (Balance Sheet and Statement of Revenues & Expenses) to the County Lead on a monthly basis, during the life of this Agreement

7. Ownership of Assets

C800 will own all assets purchased or constructed with bond proceeds and will account for such assets in its accounting records. If any of the following events occur prior to the full repayment of the bonds, all assets purchased with the bond funds automatically and without further action revert to the ownership of the County:

(a) C800 becomes insolvent;
(b) C800 suffers or consents to or applies for the appointment of a receiver, trustee, custodian, or liquidator of C800 or any material part of the C800’s property;
(c) C800becomes generally unable to pay or fails to pay its debts as they become due;
(d) C800 makes a general assignment for the benefit of creditors;
(e) C800 files a voluntary petition in bankruptcy or seeks to effect a plan or other arrangement with creditors or any other relief under the Bankruptcy Code or under any state or other federal law granting relief to debtors, whether now or hereafter in effect;
(f) Any involuntary petition or proceeding pursuant to the Bankruptcy Code or any other applicable law relating to bankruptcy, reorganization, or other relief for debtors is filed or commenced against C800 and is not dismissed, stayed, or vacated within 60 days after the filing or C800 files an answer admitting the jurisdiction of the court and the material allegations of any such involuntary petition;
(g) C800 is adjudicated a debtor in bankruptcy, or an order for relief is entered by any court of competent jurisdiction under the Bankruptcy Code or any other applicable state or federal law relating to bankruptcy, reorganization, or other relief for debtors; or
(h) C800 takes any corporate action authorizing, or in furtherance of, any of the foregoing.

C800 agrees that it shall take all action necessary to effectuate the transfer of such Project assets to the County when required pursuant to this Section 9.

8. Progress Reports

As soon as feasible after this Agreement takes effect, the C800 project team will establish significant milestones for project completion and transmit them for review and approval to the County Board of Commissioners and the Citizen Accountability Committee. Written Progress Reports on the established milestones will be provided on a quarterly basis to the County Board of Commissioners and the Citizen Accountability Committee.

9. Right to Inspect Records

C800 shall maintain a reasonable accounting system that enables the County to readily identify C800's assets, expenses, costs of goods, and use of funds associated with the Project. The County and its authorized representatives shall have the right to audit, to examine, and to make copies of or extracts from all financial and related records (in whatever form they may be kept, whether written, electronic, or other) relating to or pertaining to this Agreement. Such records shall include, but not be limited to, accounting records, written policies and procedures; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); all paid vouchers including those for out-of-pocket expenses; other reimbursements supported by invoices; ledgers; cancelled checks; deposit slips; bank statements; journals; original estimates; estimating work sheets; contract amendments and change order files; chargeback logs and supporting documentation; insurance documents; payroll documents; timesheets; memoranda; and correspondence. C800 shall at any time requested by the County, whether during or after completion of this Agreement, make such records available for inspection and audit (including copies and extracts of records as required) by the County. C800 shall ensure the County has these rights with C800's employees, agents, assigns, successors, contractors and subcontractors, and the obligations of these rights shall be explicitly included in any contracts, subcontracts or agreements regarding the purpose of this Agreement and/or completion of the Project.

10. Assignment

The rights and obligations of C800 under this Agreement may not be assigned in whole or in part without the prior written consent of the County.

11. Property Maintenance and Insurance

C800 shall be responsible for maintaining all assets purchased or constructed pursuant to this Agreement. All real property, radio towers, operating systems, equipment and components shall be maintained in accordance with manufacturer's specifications and maintenance cycles, industry standards and guidelines for similar or like items, and in a manner satisfactory to County requirements. Troubleshooting problems, repair, and replacement shall be performed on an as-needed basis, but all systems, equipment and components exhibiting the possibility of potential failure shall be repaired or replaced at the soonest possible opportunity to prevent system failures

C800 shall maintain an inventory of Radio System assets subject to this Agreement; notify the County of any loss or damage; and secure prior approval from the County for disposal of such assets. Within one (1) year of this agreement, C800 shall submit an asset management plan to the County covering any and all assets procured or to be procured with bond funds. This asset management plan will become the basis for maintenance reimbursements throughout the life of the bond.

C800 shall provide insurance for all assets purchased and utilized under the terms of this Agreement. The type and amount of insurance shall be maintained at the same levels as C800 maintains for other similar assets. Clackamas County, its agents, officers, and employees shall be a named as additional insured on the insurance policy as regards the Project assets. Proof of insurance shall be submitted to the County Lead no later than the submission of the first reimbursement request.

12. Term of Agreement

Unless earlier terminated by mutual agreement, this Agreement shall terminate upon retirement of the bonds or the life of any refunding of same, whichever is later.

13. Disposition of Unused Funds

Upon termination of this Agreement, at the County's discretion, any unspent bond funds and any interest accrued shall be retained by the County.

14. No Third-Party Beneficiaries

This Agreement shall be solely between C800 and Clackamas County. No benefits are intended for, nor shall any benefits accrue to, any third party as a result of this Agreement.

15. Duty to Cooperate; Remedies for Breach

If a conflict arises between the parties in the implementation of this Agreement, the parties agree to work in good faith toward a cooperative resolution. If, despite good-faith efforts to work cooperatively, either party fails or refuses to complete its obligations under this Agreement, the party not in breach shall have all remedies available at law to compel compliance by the other party and to recover monetary damages necessary to make the non-breaching party whole. In addition to any other remedy available at law or equity, failure of C800 to meet the obligations set forth herein shall allow the County to require the disgorgement, return, or repayment of funds received under this Agreement promptly, but in any case no later than sixty (60) days.

16. Amendment.

This Agreement may be amended by mutual agreement of the parties. To be effective, all amendments shall be in writing and signed by authorized representatives of each party.

17. Hold Harmless

Subject to the limitations of liability for public bodies set forth in the Oregon Tort Claims Act (ORS 30.260 to 30.330), C800 shall hold harmless and indemnify the County, its officers, elected officials, employees, and agents against any and all claims, damages, losses and expenses, arising out of, or resulting from C800's own acts or omissions.

18. Severability.

If any term or provision of this Agreement is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the agreement did not contain the particular term or provision held to be invalid.

DATED THIS _____ day of _____, 2016.

Clackamas County Board of Commissioners	Clackamas 800 Radio Group
_____	_____
John Ludlow, Chair	Fred Charlton, Chair
Approved as to form:	Approved as to form:
_____	_____
Chris Storey, Assistant County Counsel	Eileen Eakins, C800 Attorney

CLACKAMAS
800 RADIO
GROUP

11300 SE Fuller Rd
Milwaukie, Oregon 97222
(503) 780-4806
C800.ORG

November 22, 2016 / Revised November 30, 2016

In accordance with Article 3 of the Intergovernmental Agreement, between Clackamas County (County) and Clackamas 800 Radio Group (C800) for the Clackamas County Public Safety Radio System Replacement Project Bond Funding (Project), C800 shall provide a Project Plan (Plan).

C800 will develop a comprehensive project plan that includes detailed scope, deliverables, cost, and timelines for all elements of the Project. Once approved by the County, The plan shall automatically and without need of further action replace Exhibit A to this Agreement. The County shall not be obligated to disburse funds under Section 5 until such Project Plan is completed.

.

The following is the Project Plan:

Section 1 - Project History

Section 2 - Project Scope

Section 3 - Deliverables

Section 4 - Cost

Section 5 - Timelines

C800 User Agencies

Clackamas Fire District #1
Chief Fred Charlton
Chair C800

Boring Fire District
Chief Fred Charlton

Canby Fire District
Chief Jim Davis

Canby Police
Chief Bret Smith

Clackamas County Sheriff
Sheriff Craig Roberts

Estacada Fire District
Chief Bob Morrisey

Gladstone Police
Chief Jeff Jolley

Gladstone Fire
Chief Tom O'Connor

Lake Oswego Fire
Chief Larry Goff

Lake Oswego Police
Chief Don Johnson

Milwaukie Police
Chief Steve Bartol

Molalla Fire District
Chief Vince Stafford

Molalla Police
Chief Rod Lucich

Oregon City Police
Chief Jim Band

Sandy Fire District
Chief Phil Schneider

Sandy Police
Chief Kim Yamashita

TVFR
Chief Mike Duyck

West Linn Police
Chief Terry Timeus

American Medical Response
Ben Sorenson

Lake Oswego Communications / LOCOM
Leslie Taylor,

Clackamas 9-1-1 Dispatch CCOM
Bob Cozzie, Director

John Hartsock, Manager C800

Section 1 - PROJECT HISTORY:

REGIONAL RADIO PARTNERSHIP: In 2010 C800, WCCCA (Washington County Consolidated Communications), City of Portland, and CRESA (Clark Regional Emergency Services) all realized that their respective public safety communications systems would need to be replaced in near future do to age, looming lack of support and technology advances to digital that have occurred since these systems were implemented. The four organizations formed a partnership named the Regional Radio Partnership. The goal of the partnership was to determine the future public safety communications system needs for the greater Portland region.

REGIONAL PUBLIC SAFETY RADIO SYSTEM HISTORY:

- In 1993 the City of Portland implemented a Multnomah County wide 800 MHz public safety communications system. This project was funded by City debt issuance.
- In 1994 WCCCA (Washington County, Oregon) implemented a county wide 800MHz public safety communications system. The project was funded by a voter approved serial levy.
- In 1996 CRESA (Clark County, Washington) implemented a county wide 800MHz public safety communications system. This project was funded by an increase in the local sales tax
- In 2002 C800 (Clackamas County, Oregon) implemented a county wide 800MHz public safety communications system. The project was funded by a Clackamas County issuing debt which was repaid by the C800 Partners via user fees.
- In 2002 C800 and WCCCA formed a partnership via Intergovernmental Agreement to couple the two systems together which reduced capital cost and operating cost. WCCCA Technical Services manages and maintains the combined systems.

These four new systems replaced a multitude of aging, independently operated 450MHz / UHF and 150MHz/VHF systems owned by the various public safety jurisdictions within the four counties.

REGIONAL RADIO SYSTEM STUDY: The partnership obtained a $1.1M FEMA (Federal Emergency Management C800) / PSIC (Public Safety Interoperability Communication) grant to retain a consulting firm with the appropriate technical expertise to conduct a comprehensive assessment and provide recommendations for a public safety communications system for the region.

The partnership prepared and published a request for qualifications to which eleven firms from across the country replied. From the eleven firms three were short listed to provide a comprehensive proposal. All three firms are nationally recognized public safety communication system planning, procurement, project management, and commissioning experts.

Note that radio equipment vendors were not allowed to participate in the consulting work.

IXp from Cranbury, New Jersey was chosen by the evaluation committee to perform the work.

The partnership also prepared and published a request for proposals for project management firms to coordinate and oversee the work of the technical consultant. Deltawrx, Los Angeles, CA was chosen by the evaluation committee to perform the work. It should be noted that Deltawrx also has extensive experience in public safety communication systems planning, procurement, project management, and commissioning.

WHY DO THE RADIO SYSTEMS NEED TO BE REPLACED?

1. **Maintain Interoperability:** The Federal and State governments are requiring interoperability between all public safety systems. The Region enjoys effective interoperability with its current systems. However, as some of the partners and adjacent jurisdictions upgrade their technology this current interoperability will be lost.
2. **End of Life of the Equipment:** As happens with all electronic technology, the equipment in these four systems has either been phased out, or is being phased out by 2017 to a digital solution. This means technical support, repairs, upgrades, and parts by the manufactures are will be no longer available.
3. **Technology Advancement:** The current systems are mid 1980's based analog technology which is now approaching thirty years old. Without vendor support for repairs and replacement parts these systems will become unsupportable and eventually begin to fail. The result will be loss of some or all the critical elements of the current communications systems. The rate or magnitudes of failures or resulting impacts are not easily predictable.
4. **Population Growth:** The region's population has significantly increased since 1990 and continues to increase. This increases the service area of law enforcement and Fire/EMS personnel and the need for additional radio and data communications coverage.

REGIONAL RADIO RECOMMENDATIONS: IXp's approved work product and deliverables included:

1) Needs Assessment Report – (Interviews and surveys of user agencies and field personnel),

2) Legacy System Characterization Report – (Site visits and evaluation of existing systems),

3**) System Alternatives and Recommendation Report** –

- Move to a digital 800/700MHz trunked platform which is P25 compliant to allow a multi-vendor solution.
- Comply with State and Federal interoperability requirements.
- Accommodate population growth by adding additional radio coverage.
- Improve the limited "in building" radio coverage to key buildings such as schools, hospitals, retail centers, and large office buildings.
- Add an LTE broad band mobile data layer.

4) Functional Requirements Report, –

- Provide on the hip portable radio coverage across all four counties.
- Provide an additional 12dB of signal for in building coverage within all urban growth boundaries.
- Provide LTE broadband mobile data.

5) Conceptual Design,

6) Cost Analysis Report,

7) Cost of Operations Document, and

8) Business Plan.

IXp's recommendation was to consolidate and create one system for the four-county area.

The Regional Radio System Partnership, after careful deliberation, determined that a "system of systems" approach would be more effective than one, single, multi-county / multi-state system. The "System of Systems" approach allows each entity to own and operates their own system but to share resources where possible while ensuring compatibly and interoperability between systems.

The Regional Radio System Partnership continues with a mission to coordinate these systems.

CURRENT RADIO REPLACEMENT APPROACH FOR - PORTLAND / CRESA / WCCCA / C800:

	Portland	CRESA	WCCCA	C800
Service Area	466 sq. miles	656 sq. miles	726 sq. miles	1879 sq. miles
Population	766,135	443,817	550,990	383,857
Law Enforcement / Fire Agencies	13	20	19	16
Number of Cities	6	8	12	7
Vendor	Motorola	Motorola	TBD	TBD
Status	Complete	90% Complete	Planning	Planning

CITY OF SALEM:
The City of Salem in this same time frame determined that it too needed to update its public safety radio system. Salem has chosen to procure an 800MHz Project 25 trunked radio system as well which effectively enlarges the Portland regions "System of Systems" approach. They have chosen Motorola as their vendor and are in the planning stages.

Section 2 - Project Scope:

General Overview:

- The conceptual design of the Project is to maintain and expand the existing public safety radio coverage and to address the potential for system performance loss for going from analog to digital.
- Based on radio propagation studies the design adds 14 new sites for enhanced coverage and in building coverage improvements.
- Due to the technology and the age of the microwave system as well as the added radio sites the design includes the replacement of the microwave system.
- The design is based on an APCO Project 25 (P25) Phase 2 simulcast solution. Utilizing Phase 2 vs. Phase 1 now is to avoid the upgraded at a future time and to gain additional talk channels.
- The design will be deploying a geo-redundant master site and geo-redundant prime sites for sustainability.
- The design includes the replacement of the dispatch console systems at LOCOM and CCOM.
- The design includes the development of a backup dispatch system to be utilized in disaster situations
- The design includes a dedicated antenna system for the Clackamas County Jail to insure coverage
- The basis for design is a Motorola Astro Project 25 system including its feature sets and interoperability options. As the balance of the systems in the Portland Metropolitan area (City of Portland / CRESA / Salem) have chosen to utilize Motorola it is imperative that the C800/WCCCA system be 100% compatible and interoperable to maintain officer safety.
- The Project will provide a portion of the replacement portable and mobile radios for all police and fire personnel, the user agencies are responsible for the balance.
- The Project includes purchasing long term warranty services and system upgrades and technology refresh on every 2-year basis for 10 years.
- The Project includes the replacement of the paging notification system.
- The Project is a joint venture between C800 and WCCCA in accordance with the Intergovernmental Agreement between the agencies.

System Design: Based on the work of IXP, from the Regional Radio Partnership study, C800/WCCCA personnel utilized the Functional Design and Conceptual Design reports to build the basis of the proposed system. The team set the system performance requirements or coverage considerations to be a portable radio worn on the hip with reliability 97% of the time over 90% of the area with a Digital Audio Quality (DAQ) of 3.4.

Coverage considerations dictate the number and locations of our radio sites. The frequency availability and traffic patterns determined that the system should be simulcast. Simulcast means that the radio transmission is transmitted from multiple sites at the exactly same time so that anyone within the coverage area can hear or talk back. Coverage engineering may be the most complex area of the radio system specification and design process.

There are many ways to describe coverage performance. It is typically done in several different ways, which together describe what our user can reasonably expect when the new system is implemented. Delivered Audio Quality (DAQ) is the most common signal quality measure in P25 for Public Safety.

DAQ	Definition
1	Unusable. Speech present but not understandable.
2	Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion.
3	Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.
3.4	Speech understandable without repetition. Some noise or distortion present.
4	Speech easily understandable. Little noise or distortion.
4.5	Speed easily understandable. Rare noise or distortion.
5	Perfect. No distortion or noise discernible.

For Public Safety, the accepted objective is to provide DAQ 3.4 over the service area. DAQ 3.4 is defined as "speech understandable with repetition only rarely required, and with some noise and/or distortion." A lower DAQ (for example 3.0) may require excessive speech repetition while a higher value (for example 4.0) may require a prohibitively high level of infrastructure investment.

Further the user community requested improved communications within buildings particularly Schools / Hospitals / Government Buildings / Large Retail Buildings / Large Commercial Buildings. To provide this additional coverage over the entire service area (Clackamas County) was prohibitively expensive. It was determined that providing this additional coverage within established UGB's (Urban Growth Boundaries) would be acceptable to the users. It was determined that an additional signal level or power of 12dB would achieve one wall penetration. If additional coverage is required building owners will need to add in-building amplification systems as required by the Oregon Building and Fire codes.

C800 has 11 existing sites. The team utilized computer design software to predict where additional sites would be required to meet the desired coverage and performance model. Based on these predictions 14 additional sites were located. (See attached maps showing Portable at the Hip and Mobil coverage. Note the maps also show the WCCCA sites as the sites in both systems combine to meet our coverage predictions.)

The system is segregated into Cell's to place radios in geographical areas to meet predicted radio traffic and more economically design the system. The following is a list of the proposed sites and the number of radios at each site.

C800 Simulcast Cell A	# of Radios	C800 Simulcast Cell B	# of Radios	C800 Simulcast Cell East	# of Radios	C800 Simulcast Cell C	# of Radios
Carver	10	Canby	8	Brightwood	8	Angel Falls	8
Damascus	10	Estacada Day Hill	8	Crutcher Bench	8	Oak Grove Butte	8
Wilsonville Tank	10	Highland Butte	8	Tom Dick & Harry	8	Whale Head	8
Mount Scott	10	Redland Road	8	Lenhart Butte	8		
Mountain View	10			Timberline	8		
Pete's Mountain	10						
Sandy	10						
View Acres	10						
Skyline or Cooks Butte	10						

Goat Mtn ASR	8	**Sawtell ASR**	8				

The final radio system design will also include VHF / UHF / and 700/800MHz federal interoperable radios for back up and disaster management.

The radio system design includes appropriate spares, test equipment, staff training, and an asset management system to insure equipment control.

NOTE: The Radio System design outlined here will be augmented with final System Design documents from the selected radio system vendor.

The team has designed an 11GHz microwave communications loop between the radio sites to facilitate communications between the sites and to the prime sites at Clackamas County Communications (CCOM) and WCCCA.

NOTE: The Microwave System design outlined here will be augmented with final System Design documents from the selected microwave system vendor.

The design includes a 48V DC power system at each site to operate the radio system. This is comprised of a 2000 Amp Hour battery stack and rectifier charging system to maintain the batteries.

There is a CCTV system at each site for security along with other security and alarm functions to manage and control the site.

NOTE: The CCTV / Security / Alarm System designs outlined here will be augmented with final System Design documents from the selected vendors.

Site Designs: The typical project radio site is a 2,500sq ft. compound enclosed by a chain link fence. The site contains a 12'x24' pre-cast concrete communications shelter to house the radio equipment. The shelters contain redundant HVAC units to heat and cool the structures. There is also a 150' or 180' lattice type communications tower (based on site specifics) with transmit and receive antennas and microwave dishes. The towers are designed to with stand a min of 90mph wind and ice accumulation (based on location), and level 4 seismic movement. These sites are considered "Essential Facilities" by the Oregon Building Code which imposes significantly greater design requirements for survivability in seismic and wind events. There is an emergency backup generator with a 1,000gal propane fuel supply as backup power in the event of losing utility power.

Existing Sites: Existing sites will be evaluated on a site by site basis to determine upgrades required to meet current requirements. All existing towers will be evaluated to determine if upgrades are required to meet loading and seismic stability and survivability. At a minimum existing generators, more than five years old, will be replaced and all fuel tanks increased to 1,000 gal. Existing 48V battery systems will be upgraded to current technology and battery strings more than 5 years old will be replaced.

Section 3 – Deliverables

The following outlines the Project deliverables by project component:

1. **Project Management**
   The Project Manager shall be responsible for providing the overall program coordination, scheduling, and cost oversight and the successful implementation of all key project elements. The Project Manager shall establish project priorities and goals for project performance including budget and schedule limitations and oversee projections for and timely achievement of milestone completion dates for project.

   The Work shall include be not be limited to:

   a. Develop and maintain a master schedule of all project elements depicting key milestones, project progress, resource utilization, and project cost. All to be tracked and reported periodically, in a time progressive manner.

   b. Develop and maintain a master financial schedule of all assigned projects to track individual project budget totals and cash flow.

   c. Develop and support the implementation of policies and procedures for project operations

   d. Manage the various project elements via their respective project managers that are assigned by the vendors as contracts are established and set in motion.

   e. Generate and distribute (minimum of monthly)/present periodic summary/management reports that clearly communicate the projects status, costs, progress, issues, or concerns and any corrective actions or counter measures as may be needed to maintain the master schedule.

   f. Call and oversee periodic project meetings (minimum of one per month) with all others responsible for one or more key project element, collect status, create and assign actions items as needed, generate action reports and track and close all actions. Elevate any action or issue that impacts the overall schedule in a negative manner.

   g. Attend meetings with land owners/potential land owners, public officials, and contractors as needed to assist the Site Acquisition and Design consultants to secure lands, and permits for the construction of communications sites.

   h. Attend status meetings with C800, management and/or staff to provide timely and accurate project status and progress.

   i. Aid and/or advice in the development and execution of the procurement process as appropriate, for each key project element.

   j. Coordinate with WCCCA and/or C800 Technical Staff to ensure deliverables/assignments are scheduled and coordinated to maintain project flow.

   k. Coordinate FCC frequency licensing and allocation, and coordinate fleet mapping.

2. **Site Acquisition / Permitting / Entitlement:**

   Completed site acquisition and required land use and construction permits for designated sites. The work shall include but not be limited to:

   a. Provide management and administration for the land acquisition and entitlement process for the use of communication sites required by C800. Define and manage the site identification, due

diligence, procurement or leasing, and permitting of new public safety communication facilities, and provide financial tracking, forecasting and billing as per C800 contract terms.

b. Assist in acquiring clear land title/site lease/shared use agreement for the selected candidate sites and assist in negotiations for land purchase or option/ lease/ license agreement.

c. Prepare an analysis of lease vs. purchase option for C800's consideration prior to negotiations being initiated for a site.

d. Ensure proper flow of information concerning site acquisition, permitting and notice to proceed to construction with C800 to facilitate a smooth and efficient transition to construction and project closeout.

e. Negotiate site acquisition to meet C800 guidelines. Work with third party site design personnel and C800 to resolve business related issues. Gain legal approval from C800 Counsel and/or aid in negotiation and resolution of business and legal issues.

f. Serve as a point of contact for the community and/or government permitting agencies.

g. Manage the preparation and filing of all entitlement applications and obtain landlord/owner signatures as required.

h. Oversee the completion of zoning and permit applications for submittal to jurisdictions and coordinate the zoning process with C800 and related contractors.

i. Manage the coordination, scheduling and tracking of site visits for C800 technical staff, authorized contractors, consultants or engineers until the permitting process is complete.

j. Coordinate, order and track due diligence activities including but not limited to title, environmental reports, regulatory reports, lease exhibits and engineering plans required for zoning and building permit approvals.

k. Manage preparation and update of site status reports/databases, site close-out packages, and attend C800 project meetings as required.

l. Build a working relationship with land owners, as well as federal, state, and local governmental agencies as appropriate; preparing and presenting proposals and gauging their motivation for the project.

m. Prepare, route and file all recording documents and administrative paperwork necessary to complete the site acquisition process.

3. Site Design and Engineering:

Provision of engineering services (civil/electrical/structural / landscape and others as necessary) required to develop plans and specifications for: a) land use submissions and approvals; b) building permit submittal and approval; c) competitive bid packages; d) construction administration for the construction of public safety communication sites which are considered essential facilities. Services shall be aligned with the stringent requirements associated with public safety communication's systems and shall ensure full compliance with Motorola R56 Site Standards, local, state and federal codes and regulations as applicable. The work shall include providing:

a. Plans, associated details and specifications for all elements including but not limited to:
    i. Vicinity map / zoning map
    ii. Site plan depicting the building, tower, generator and fuel source, fencing, utilities and ingress and egress routes
    iii. Grading and Erosion control plan

iv. Tower/site grounding plan including external and internal one line depictions and ground buss details (internal and external) that is compliant to Motorola R56 Site Standards Elevations (building & tower) as designed by a registered professional engineer

v. Shelter floor plan/layout and foundation design

vi. Tower, generator, fuel tank and associated foundation structural design

vii. Tower antenna, mounts, lines and hardware plan/schedule

viii. Detailed antenna system schematics (insets) including Azimuth and Elevation for each antenna

ix. Electrical plan including utility service requirements

x. Site fencing plan and associated details

xi. General Notes, contact information and requirements including a legend for abbreviations and symbols.

xii. Photo Simulations

b. Jurisdictional application/process: The Consultant will support C800's site acquisition consultant in the entitlement and permitting process including but not limited to:

i. Development of preliminary plans for and attending Pre-Application Review/Meetings and making corrections as required by the jurisdiction to obtain approval;

ii. Completion of required plans, specifications, and other documentation required for building permit application/plan review and corrections as required by the jurisdiction to obtain the building permit;

iii. Design review presentations as required

4. Survey:

Provision of survey services by an Oregon licensed Surveyor including but not limited to:

a. FAA 1A Certification for the proposed tower structure at the site per FAA standards. The certification will list the geographic coordinates of the structure, the ground elevation and the height of the proposed tower.

b. Initial topographic survey of the tower site locating existing trees, fences, buildings and other improvements as depicted on the preliminary plans. The extents of the survey will be further defined during the initial site visit. Proposed power and telephone connections will also be located as directed by the C800 representative. Utilities marked out by the locate services will be located and shown on the survey. Easements and other plottable exceptions listed in a client provided title report will be shown on the survey.

c. Final Survey based on a site plan provided by C800, (an update to the Initial Survey) of the site showing the compound area and access/utility easements. A legal description of the lease area and access/utility easement will be provided.

d. Construction Survey shall include staking services of placing hubs and lathe at: compound corners, shelter corners, tower center and north offset, and access and utility route.

5. Geotechnical Investigation and Recommendations / Environmental Studies:

Provision of Geotechnical investigations including field exploration, laboratory testing, foundation recommendations. To perform soils restively testing to be utilized for grounding design. To complete environmental studies including an ESA Phase 1 study, NEPA, archeology, and tribal reviews in accordance with permitting jurisdictions.

a. Field Exploration Obtain utility locates and procure any required permits from authorities having jurisdiction. Provide one boring or test pit as required for a complete site evaluation. Classify and log subsurface soil conditions in the test holes and obtain bulk samples for laboratory testing.

b. Perform laboratory testing as required to determine soil classifications, allowable bearing pressures for short and long term loadings, active and passive soil pressures, friction coefficient, and related information for use by the structural engineer.

c. Evaluate site seismic hazards including, but not limited to, site geology, subsurface conditions, faults, ground movement, liquefaction potential and related information as necessary for the structural engineer to design foundations and tower steel.

d. Geotechnical report, provide design recommendations including, but not limited to, bearing capacities (short and long term), active and passive lateral pressures, friction coefficient, seismic recommendations, boring logs, laboratory test results, maps and supporting documentation.

e. Perform a soils resistivity survey in accordance with ASTM method G57-06 / IEEE Standard 81. Provide a report which outlines the findings for use by the Electrical engineer to design the appropriate R56 grounding system.

f. Perform NEPA, archeology reviews and tribal reviews in accordance with FAA requirements providing the required notifications and reports.

g. On the US Forest and Bureau of Land Management sites perform NEPA studies per the directives in the Forest Service Handbook 1909.15, or the Bureau of Land Management NEPA Handbook H-1790-1, as appropriate. All projects shall involve continuous consultation and review with the appropriate overseeing federal agency. At the completion of each study the following studies shall be provided: A complete report, in electronic and/or physical form, ready for submission on a date to be determined. Project Management of the project to deliverable is the responsibility of consultant including creation of milestones. Consultant will provide progress reports via phone conference, email or office visit as needed. Other deliverables as C800 requests or as project requires.

6. Site Construction:

Based on plans and specifications developed under the Site Design and Engineering deliverable above the Project Manager shall develop and Invitation to Bid for the construction of the project scope depicted on the approved plans and specifications. This will be for new site development and for the retrofitting or remodeling of existing sites. The Invitation to Bid shall be advertised, bid, and awarded in accordance with C800's purchasing rules. The Project Manager will oversee the Site Construction and monitor progress and budget control, assure appropriate permits from local jurisdictions have been obtained. The Project Manager will arrange for independent testing and inspection services as required by the permitting jurisdiction.

7. Modular Buildings / Towers / Generators / 48V DC Power Systems / Site Alarms / Security Systems / Telemetry Systems / Network Management Systems:

Based on plans and specification developed under the Site Design and Engineering deliverable and design standards developed as part of the final Radio System Design the Project Manager shall develop individual Invitations to Bid for the procurement of the Modular Buildings / Towers / Generators / 48V DC Power Systems / Site Alarms / Security Systems / Telemetry Systems / Network Management Systems. The Invitations to Bid shall be advertised, bid, and awarded in accordance with C800's purchasing rules. The Project Manager will oversee the production of these items and coordinate the delivery of the items to the site and integration into the project.

8. Microwave Communications System:

The microwave communication system will be designed as part of a Design Build procurement and the requirements of the final Radio System Design. C800 procured and upgraded the existing microwave system in late 2015 due to technical issues. It is currently the intent to have that vendor design the additional portions of the system to serve the new radio sites. The final design and procurement will include 28 additional paths. This will include microwave radios, antennas, installation, commissioning, and training.

NOTE: The Microwave System deliverable outlined here will be augmented with final System Design documents outlining deliverables from the selected microwave system vendor.

9. Simulcast Radio Equipment / Interoperable Radio Equipment / Master Site Radio Equipment / Console Equipment:

Simulcast Radio Equipment: The P25 simulcast radio equipment will consist of 202 base station radios located at the 25 sites as outlined above. Included with those radios will be racks to contain those radios, antenna systems and combiners, and associated equipment. Further the work will include installation, commissioning, and training for this equipment.

P25 Trunked System Architecture - The P25 simulcast cells and ASTRO 25 repeater sites connect back to the Project 25 master site IP core. Together, these sites provide wide-area coverage that exceeds coverage over what the existing 800 MHz analog system delivers. In Figure 1, note that each simulcast cell prime site and repeater site each have two links, one connected to the WCCCA 911 master site and the second connected to the CCOM master site location, as part of the Dynamic Systems Resiliency (DSR) functionality. Only two simulcast cells and one ASTRO 25 repeater site are shown to simply illustrate the concept of DSR geographic redundancy of the master sites and how they connect to the radio sites.

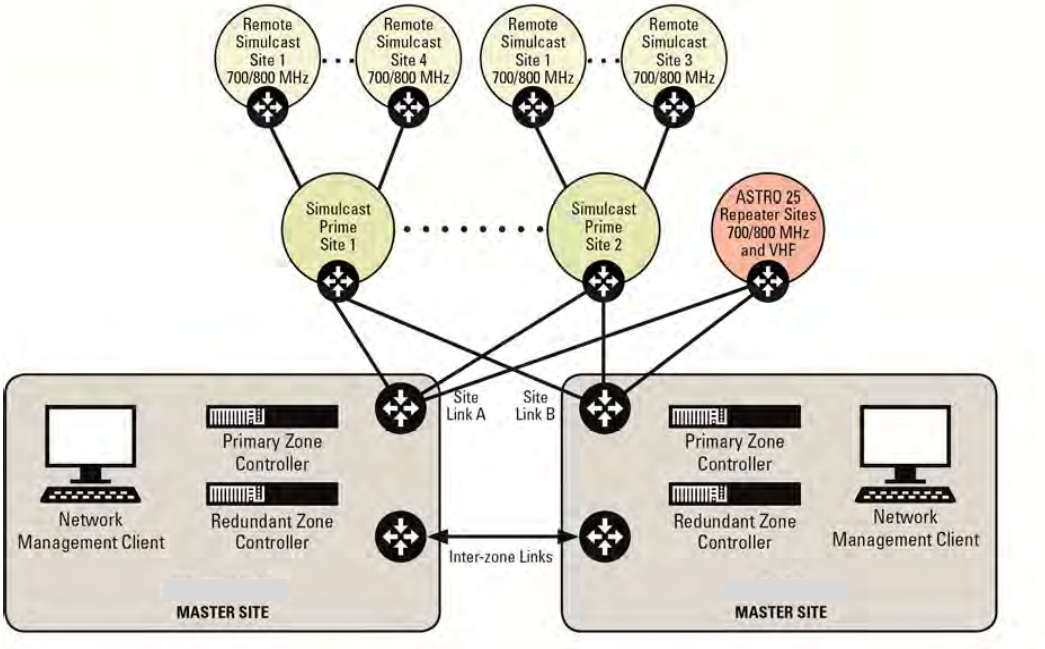


Figure 1 - High-Level Diagram of the P25 trunked Simulcast & ASR Subsystems

Trunked Simulcast Cells & ASR Sites - The proposed simulcast design maximizes the use of existing sites and RF infrastructure while offering industry-leading radio coverage performance through proven simulcast technology and design. The design allows for the greatest site separation distances between sites, which mean fewer simulcast sites are needed to cover a given area. Another benefit of simulcast systems is that the voting comparators automatically select the best site which enhances inbound (talk-in) coverage from radio users.

In Figure 2, the simulcast cells and ASR sites are shown once again connecting to the master sites, however, note the geographic redundant prime site controllers that are part of the proposed P25 trunked LMR system design. Geographic redundant prime sites controllers and voting comparators is known as "High Availability" simulcast

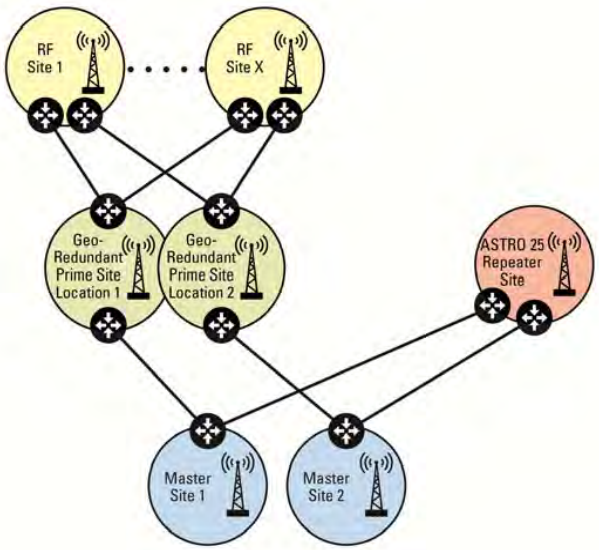


Figure 2 - High-Level Diagram of the P25 trunked Simulcast Cell & ASR subsystems

Simulcast Subsites - The GTR 8000 repeater system is at the core of the simulcast cells and ASR sites. The GTR 8000 platform requires low power, minimized rack space, and utilizes an IP based transport layer, which allows increased backhaul flexibility and capacity. Subscriber audio is received and packetized by the stations. The internal GPB 8000 provides both LAN routing and GPS services for each station at the site. The packetized audio is routed via the GPB 8000 and the local redundant site routers to the MPLS/microwave backhaul network. The microwave routes the audio to the active prime site to be voted.

ASTRO 25 Repeater (ASR) Sites - To supplement the wide-area simulcast coverage, standalone trunking repeater sites will provide localized facility and targeted fill-in coverage across the county. Each of the proposed repeater sites houses the same GTR-based hardware platform as the simulcast cell subsites. However, unlike the simulcast remotes sites, which connect to a prime site, the standalone trunking sites will connect directly to the master sites. These sites extend the P25 digital trunking coverage, and users will roam between the simulcast cells and repeater sites, without user or dispatch intervention.

Interoperable Radio Equipment This equipment will consist of 28 base station radios located at the 3 sites as outlined below. Included with those radios will be racks to contain those radios, antenna systems and combiners, and associated equipment. Further the work will include installation, commissioning, and training for this equipment.

There are three sites identified as interoperability sites which will contain new VHF, UHF, 700 & 800 MHz conventional base station equipment. These will all be wire-line controlled analog base station except for the 700 MHz stations, which operate in P25 digital mode. The four sites are as follows.

Timberline: 4 - VHF, 4 - UHF, 4 - 800 MHz, and 4 - 700 MHz stations

Goat Mtn: 2 - VHF, 2 - UHF, 2 - 800 MHz, and 2 - 700 MHz stations

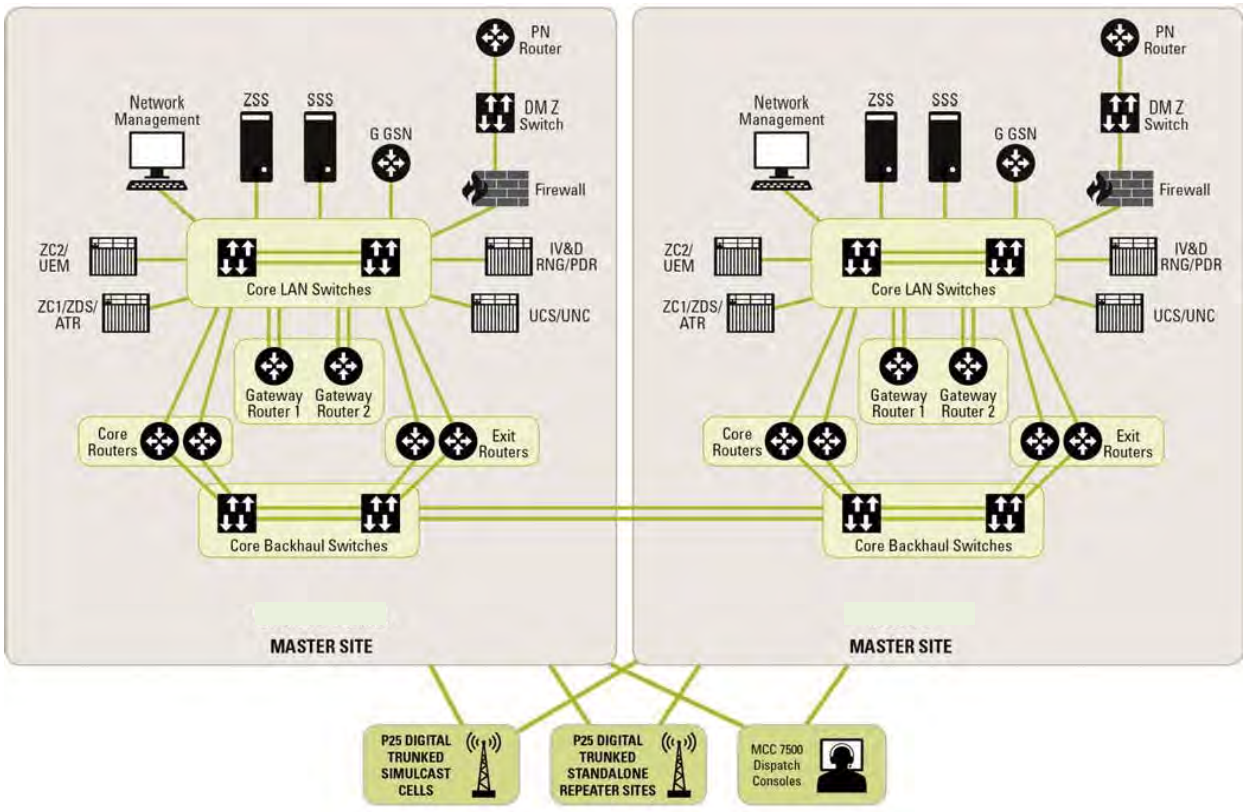
Mount Scott: 4 - 700 MHz stations

Each site has a combining and multicoupler w/TTA (Tower Top Amplifier) system employed, except VHF will have no TTA unit. The VHF & UHF banded stations will have their own antenna systems, while the 800 MHz & 700 MHz combining systems will share usage of the P25 trunked LMR (Land Mobile Radio) antennas. The P25 trunked LMR antennas have been selected to span the entire 700/800 MHz band which makes this possible.

Master Site Radio Equipment: This equipment processes calls and manages the system for the voice, data, and console subsystems. Two master sites will be utilized, with each master site providing backup for the other, one at CCOM and the other at WCCCA to provide geographic redundancy. The master sites will be designed to support the following features and functionality.

a. Geographic Redundant Master Sites via Dynamic Systems Resiliency (DSR)
b. High Availability Simulcast with Geographic Redundant Prime Sites and Comparators
c. Integrated Enhanced Voice & Data
d. Advanced Messaging System (AMS) and Client
e. Ethernet iPv6 Redundant Site Links (one link to each master site)
f. Inter System Subsystems Interface (ISSI) 8000 with Automatic Roaming in Redundant Configuration (one ISSI 8000 connects to each master site)
g. Encryption Key Management Facility (KMF) in Redundant "box" Configuration on the Customer Enterprise Network (CEN)
h. Customer Network Interface (CNI) in Redundant Configuration (each CNI connects to one master site)
i. Network Management Clients (two at each master site location)
j. MOSCAD network management w/two Graphical Workstations)

The following is a diagrammatic view of the redundant master sites:



Console Equipment: Replacement dispatch console systems at CCOM, and LOCOM, have been designed using the MCC 7500 console platform. The number of console operator positions (OPs) per each agency is.

a. CCOM – 12 console OPs

b. LOCOM – 9 console OPs

One additional MCC 7500 console for CCOM will be provided to serve as a proxy console position to allow MCC 7100 console positions outside the radio network interface to perform console functions via a VP connection to the radio system.

The console system supports P25 TDMA & FDMA trunking and conventional analog and digital operation. Additional features include:

a. AES Encryption, including Over-the-Ethernet Keying on the console subsystem LAN network.

b. Logging Recorder Interface & Recorder

c. Instant Recall Recorder

d. Dual Gateway Routers w/Ethernet links to support DSR master site redundancy

e. Conventional Gateway ports to support legacy conventional operation and the Site Trunking Interoperability (IOP) control stations via 4W E&M interface.

f. Conventional Gateway ports to interface to the new Interoperability base stations located at three of the P25 trunked LMR sites

g. One locally controlled dual-band (800MHz/VHF) control station, with remote head at every OP position.

In addition to the MCC 7500 console system networks, a backup, portable MCC 7100 dispatch solution is desired by CCOM. The dispatch agency requires the capability of 8 console positions and given the portability requirement, the console PC's will be laptop computers.

NOTE: The Simulcast Radio Equipment / Interoperable Radio Equipment / Master Site Radio Equipment / Console Equipment deliverables outlined here will be augmented with final System Design documents outlining deliverables from the selected radio system vendor.

10 Paging

Paging system replacement includes an 800MHz paging system to upgrade the current technologies to improve performance. This system is currently not designed.

NOTE: The Paging system deliverable will be augmented with final System Design documents outlining deliverables from the selected paging system vendor.

11 Subscriber Radios:

Approximately 50% of the partner and member portable and mobile radios (300) will be paid for from the bond. The balance of the cost will be paid by the partner and member agencies from their funds.

12 Unified PTI:

This deliverable is for an application that can be added to a smart phone to allow the smart phone to access and utilize the public safety radio system. This item has not been designed.

NOTE: The unified PTI app deliverable will be developed with final System Design documents outlining deliverables from the selected radio system vendor.

13 Test Equipment / Spares

NOTE: The Test Equipment and Spares deliverable will be developed with final System Design documents outlining deliverables from the selected radio system vendor.

14 Asset Management

The deliverable for asset management is a computerized asset management system to track the 1,000's of components in the system, notifying of maintenance schedules and inventory management. This system is not yet fully defined.

15 Post Warranty / System Refresh Upgrade

Post Warranty is a one-time upfront cost for extension of manufacture warranty support for the radio system. This includes: technical support / infrastructure repair – depot maintenance / advanced replacement upgrades – i.e. maintains a level of spares.

System Refresh Upgrade - As with all electronics there is a constant need to periodically upgrade equipment and keep software current. This product is to cover those expenses for a ten-year period with upgrades every 2 years.

Section 4 – Cost (Rev Nov 30, 2016)

Project: **C800 Radio System Upgrade**

Date Original: 10/1/2015 **Date Updated: Dec 5,2016**

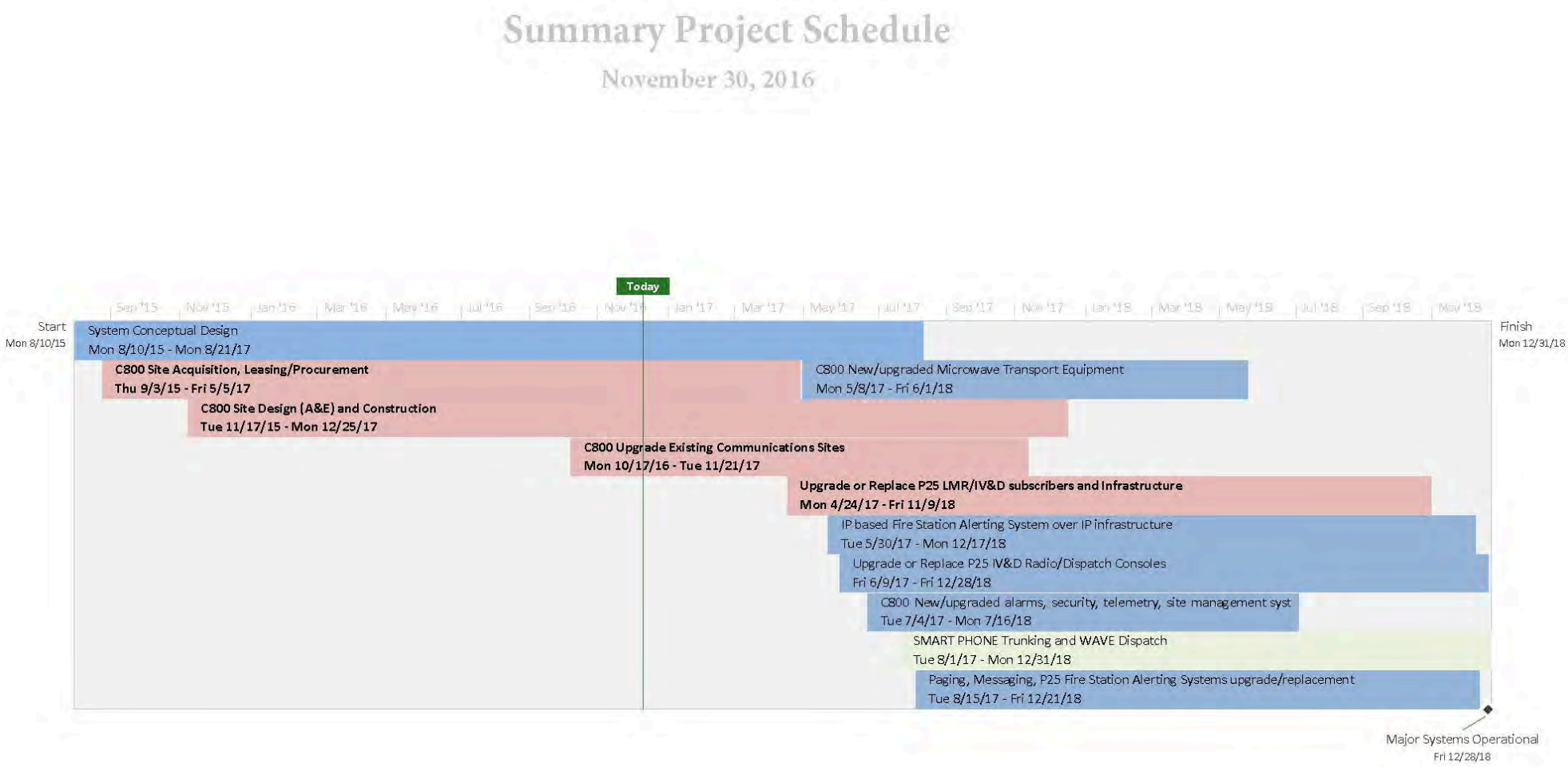
Project Manager: Ken Seymour

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
Soft Cost								
Site Acquisition Consulting - Quest	60,000	30,000	40,000	0	95.47%	70,000	(10,000)	66,832.31
Site Acquisition Consulting / Permits - Securasite	270,000	268,500		1,500	38.24%	270,000	0	103,260.33
Site Planning - Cushing	400,000	317,178		80,000	56.64%	397,178	2,822	224,943.26
Geotechnical / Environmental Consulting - Black Mtn	200,000	89,100		100,000	34.03%	189,100	10,900	64,350.00
Survey - McKay	75,000	50,160		20,000	43.64%	70,160	4,840	30,620.00
USFS Land Use Fees	10,000			10,000	0.00%	10,000	0	0.00
Land Use Fees	25,000	268		20,000	1.32%	20,268	4,732	268.00
Plan Check / Permit Cost	60,000			60,000	4.62%	60,000	0	2,769.56
Printing	2,500			2,500	0.00%	2,500	0	0.00
Bid Advertising	3,500			3,500	0.00%	3,500	0	0.00
Materials Testing & Inspection	40,000			40,000	2.81%	40,000	0	1,123.75
Project Management	300,000	279,000		20,000	0.00%	299,000	1,000	0.00
Legal Fees	30,000	12,000		18,000	21.92%	30,000	0	6,575.00
Licensing	20,000			20,000	0.00%	20,000	0	0.00
Miscellaneous	10,000	700		9,000	24.74%	9,700	300	2,400.00
Sub-Total Soft Cost	**1,506,000**	**1,046,906**	**40,000**	**404,500**	**33.74%**	**1,491,406**	**14,594**	**503,142**
Construction Cost								
Site Construction	9,200,000	320,339		8,879,661	2.55%	9,200,000	0	234,975.82
Generator	5,800,000			5,800,000	0.00%	5,800,000	0	0.00
48VDC	1,065,000			1,065,000	0.00%	1,065,000	0	0.00
Lake Oswego Antenna	18,000	17,500	0	0	100.07%	17,500	500	17,511.75
Existing Sites	100,000	6,400		93,600	6.40%	100,000	0	6,400.00

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
Equipment Costs								
Simulcast Equipment	14,928,000			14,928,000	0.00%	14,928,000	0	0.00
Master Site Equipment	3,534,000			3,534,000	0.00%	3,534,000	0	0.00
Console	1,650,000			1,650,000	0.00%	1,650,000	0	0.00
Back up Dispatch	426,000			426,000	0.00%	426,000	0	0.00
Spares	1,200,000			1,200,000	0.00%	1,200,000	0	0.00
Paging	373,000			373,000	0.00%	373,000	0	0.00
Subscriber Radios	5,000,000	1,515,649		3,484,351	39.39%	5,000,000	0	1,969,352.00
Unified Push to Talk	188,000			188,000	0.00%	188,000	0	0.00
Asset Management	119,000			119,000	0.00%	119,000	0	0.00
Post Warranty	3,100,000			3,100,000	0.00%	3,100,000	0	0.00
System Refresh / Upgrade	2,700,000			2,700,000	0.00%	2,700,000	0	0.00
Test Equipment	100,000			100,000	0.00%	100,000	0	0.00
Microwave	3,368,000	406,169		2,961,831	11.59%	3,368,000	0	390,406.05
Security System	1,364,000			1,364,000	0.08%	1,364,000	0	1,079.96
Subtotal Equipment Costs	**38,050,000**	**1,921,818**	**0**	**36,128,182**	**6.20%**	**38,050,000**	**0**	**2,360,838**
Bond Cost	300,000	290,372		0	100.00%	290,372	9,628	290,372
Subtotal Project Cost	**56,039,000**	**3,603,335**	**40,000**	**52,370,943**	**6.09%**	**56,014,278**	**24,722**	**3,413,240**
Contingency	**2,961,661**			**2,961,661**	**0.00%**	**2,961,661**	**0**	
Total Project Cost	**59,000,661**	**3,603,335**	**40,000**	**55,332,604**	**5.79%**	**58,975,939**	**24,722**	**3,413,239.59**

Bond Premium **7,165,794**

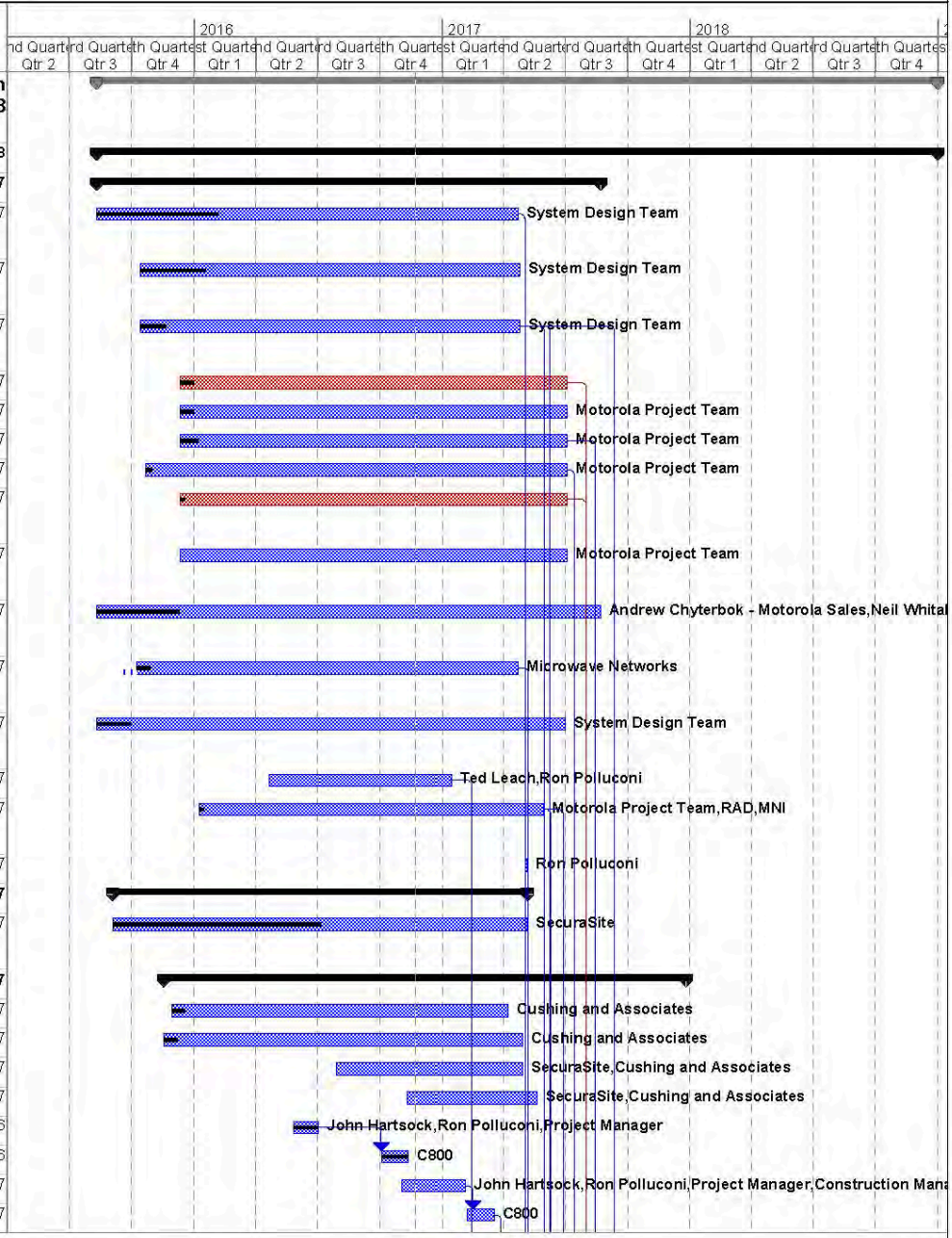
Section 5 – Schedule (Summary) (Rev November 30, 2016)



Section 5 - Schedule

Communications System Replacement Project
November 22, 2016

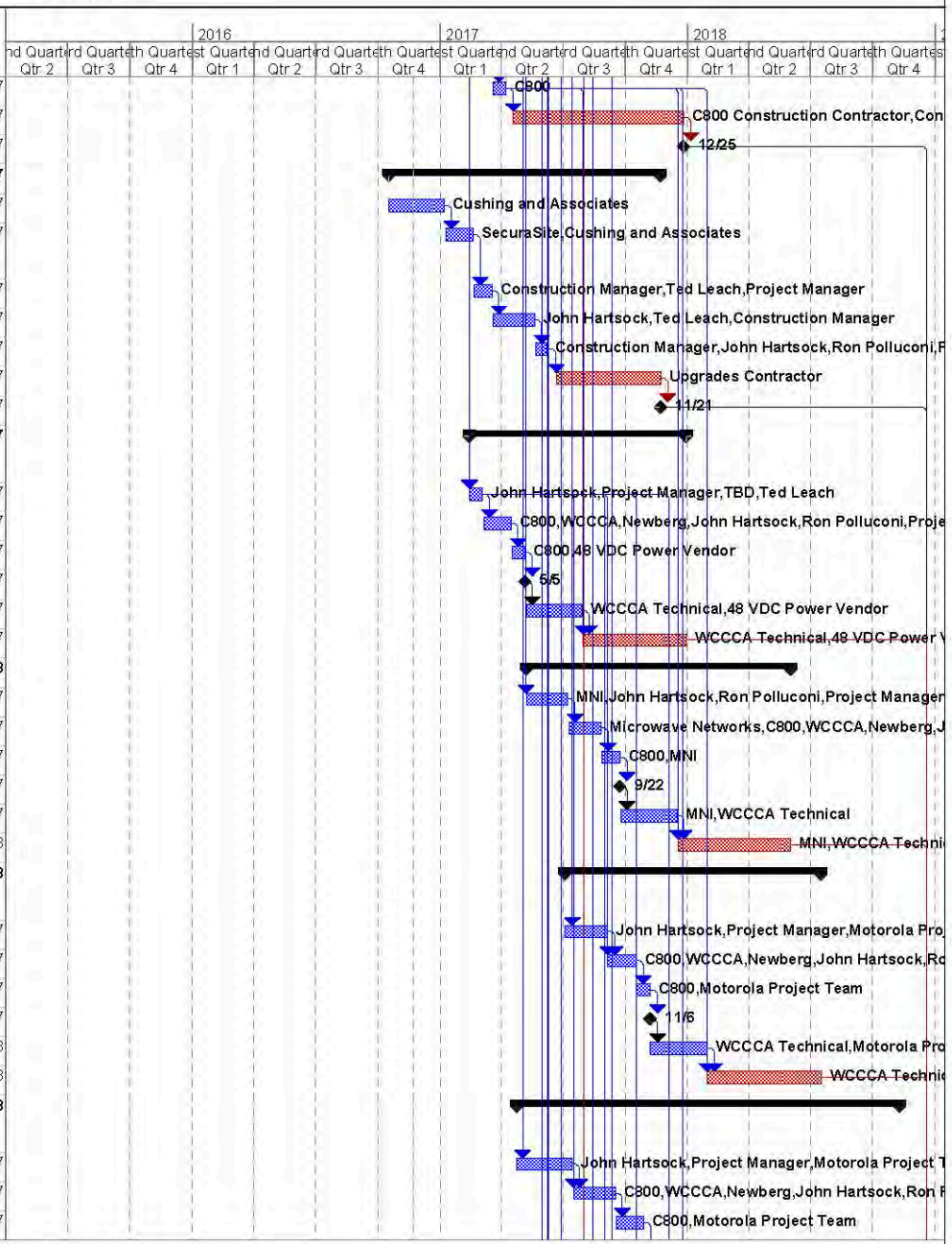
ID	Task Name	Duration	Start	Finish
0	**WCCCA_C800_Newberg Systems Upgrade 7_23_2015**	**886 days?**	**Mon 8/10/15**	**Mon 12/31/18**
1	**WCCCA/C800 Phase III P25 System (Voice/Data/Paging)**	**886 days**	**Mon 8/10/15**	**Mon 12/31/18**
2	**System Conceptual Design**	**531 days**	**Mon 8/10/15**	**Mon 8/21/17**
3	Develop and document P25 LMR Motorola System Design and Requirements.	445 days	Mon 8/10/15	Fri 4/21/17
4	Develop and document Interoperable system design and requirements	400 days	Tue 10/13/15	Mon 4/24/17
5	Develop and document P25 LMR dispatch system and requirements	400 days	Tue 10/13/15	Mon 4/24/17
6	Site on Wheels design and preliminary costs	407 days	Fri 12/11/15	Mon 7/3/17
7	Dispatch on Wheels design and preliminary costs	407 days	Fri 12/11/15	Mon 7/3/17
8	Fire Station Alerting P25 Solution	407 days	Fri 12/11/15	Mon 7/3/17
9	Site monitoring, management, telemetry	443 days	Thu 10/22/15	Mon 7/3/17
10	SMART Phone Application system design/integration and preliminary costs	407 days	Fri 12/11/15	Mon 7/3/17
11	Assest Management Application integration design and prelimiary costs	407 days	Fri 12/11/15	Mon 7/3/17
12	Determine number and type of user Radios and estimated costs	531 days	Mon 8/10/15	Mon 8/21/17
13	Develop and document Microwave Backhaul system design and requirements/Costs	401 days	Thu 9/17/15	Fri 4/21/17
14	Develop and document P25 LMR Motorola System Warranty and SUA assumptions and related costs	495 days	Mon 8/10/15	Fri 6/30/17
15	Develop 48 VDC system requirements and cost estimates	192 days	Thu 4/21/16	Fri 1/13/17
16	Develop and document an FSA Wireless ethernet system and related costs	362 days	Fri 1/8/16	Mon 5/29/17
17	Update Budgetary Plan (Capital and Expense)	3 days	Wed 5/3/17	Fri 5/5/17
18	**C800 Site Acquisition, Leasing/Procurement**	**437 days**	**Thu 9/3/15**	**Fri 5/5/17**
19	C800 Secure Leases, right of way, and power agreements	437 days	Thu 9/3/15	Fri 5/5/17
20	**C800 Site Design (A&E) and Construction**	**550 days**	**Tue 11/17/15**	**Mon 12/25/17**
21	Survey and Soils/Geotech	355 days	Mon 11/30/15	Fri 4/7/17
22	Site Designs, Engineering and Architecture	379 days	Tue 11/17/15	Fri 4/28/17
23	Obtain all necessary land use and permits	197 days	Thu 7/28/16	Fri 4/28/17
24	Obtain Construction Permits	137 days	Thu 11/10/16	Fri 5/19/17
25	Develop SOW and RFQ for Construction Project Manager	26 days	Fri 5/27/16	Fri 7/1/16
26	Contract with Construction Manager(s)	30 days	Mon 10/3/16	Fri 11/11/16
27	Develop RFP for Site Contruction	68 days	Wed 11/2/16	Fri 2/3/17
28	Publish RFP for Site Contruction	30 days	Mon 2/6/17	Fri 3/17/17



C:\Users\UNH\Documents\C800\System Replace\Timeline - Schedule\Master Schedule 11_22_2016 JH.mpp

Communications System Replacement Project
November 22, 2016

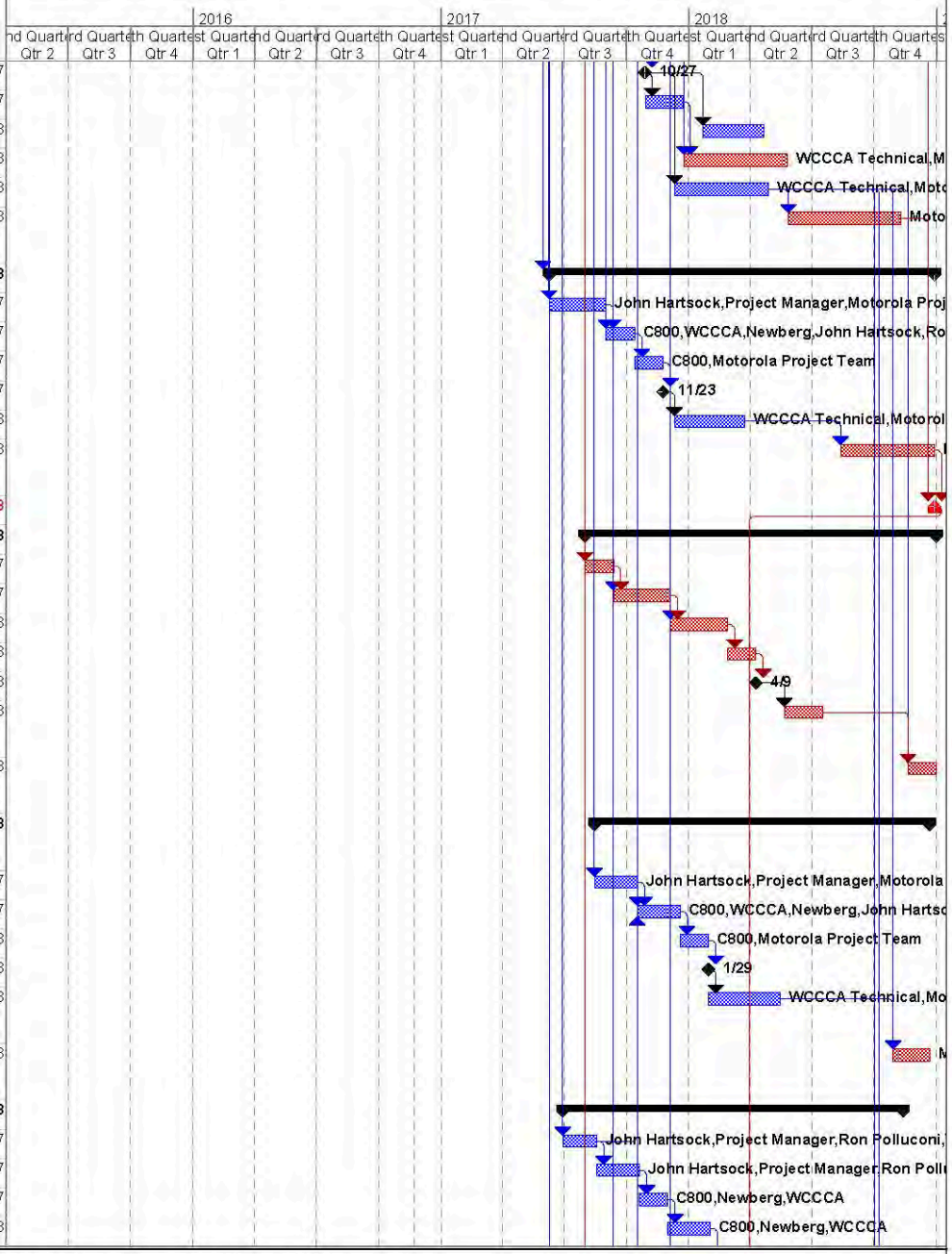
ID	Task Name	Duration	Start	Finish
29	Select Site Constuction Contractor(s)	15 days	Mon 3/20/17	Fri 4/7/17
30	Construct 11 communications Sites	36 wks	Tue 4/18/17	Mon 12/25/17
31	Communications Site Construction Complete	0 days	Mon 12/25/17	Mon 12/25/17
32	**C800 Upgrade Existing Communications Sites**	**287 days**	**Mon 10/17/16**	**Tue 11/21/17**
33	A&E and Structural as needed	60 days	Mon 10/17/16	Fri 1/6/17
34	Document upgrades and revisions and obtain CP's as needed	30 days	Mon 1/9/17	Fri 2/17/17
35	Develop RFP for Site 10 Site upgrades	20 days	Mon 2/20/17	Fri 3/17/17
36	Publish RFP for Site upgrades	45 days	Mon 3/20/17	Fri 5/19/17
37	Select Site Upgrade Contractor(s)	12 days	Mon 5/22/17	Tue 6/6/17
38	Upgrade 10 communications Sites	22 wks	Wed 6/21/17	Tue 11/21/17
39	Existing Site upgrades complete	0 days	Tue 11/21/17	Tue 11/21/17
40	**C800 New/Replacement 48 VDC and Battery Backup Systems**	**230 days**	**Mon 2/13/17**	**Fri 12/29/17**
41	Write detailed Scope of Work for all elements	15 days	Mon 2/13/17	Fri 3/3/17
42	Negotiate/validate design and pricing	30 days	Mon 3/6/17	Fri 4/14/17
43	Contract Negotiations	15 days	Mon 4/17/17	Fri 5/5/17
44	Signed Contract	0 days	Fri 5/5/17	Fri 5/5/17
45	Final Design, Manufacturing and Staging	12 wks	Mon 5/8/17	Fri 7/28/17
46	Field Install and Acceptance	22 wks	Mon 7/31/17	Fri 12/29/17
47	**C800 New/upgraded Microwave Transport Equipment**	**280 days**	**Mon 5/8/17**	**Fri 6/1/18**
48	Write detailed Scope of Work for all elements	45 days	Mon 5/8/17	Fri 7/7/17
49	Negotiate/validate design and pricing	35 days	Mon 7/10/17	Fri 8/25/17
50	Contract Negotiations	20 days	Mon 8/28/17	Fri 9/22/17
51	Signed Contract	0 days	Fri 9/22/17	Fri 9/22/17
52	Final Design, Manufacturing and Staging	12 wks	Mon 9/25/17	Fri 12/15/17
53	Field Install and Acceptance	24 wks	Mon 12/18/17	Fri 6/1/18
54	**C800 New/upgraded alarms, security, telemetry, site management systems**	**270 days**	**Tue 7/4/17**	**Mon 7/16/18**
55	Write a detailed Scope of work for each system element	45 days	Tue 7/4/17	Mon 9/4/17
56	Negotiate/validate design and pricing	30 days	Tue 9/5/17	Mon 10/16/17
57	Contract Negotiations	15 days	Tue 10/17/17	Mon 11/6/17
58	Signed Contract	0 days	Mon 11/6/17	Mon 11/6/17
59	Final Design, Manufacturing and Staging	12 wks	Tue 11/7/17	Mon 1/29/18
60	Field Install and Acceptance	24 wks	Tue 1/30/18	Mon 7/16/18
61	**Upgrade or Replace P25 LMR/IV&D subscribers and Infrastructure**	**405 days**	**Mon 4/24/17**	**Fri 11/9/18**
62	Write a detailed Scope of work for each system element	60 days	Mon 4/24/17	Fri 7/14/17
63	Negotiate/validate design and pricing	45 days	Mon 7/17/17	Fri 9/15/17
64	Contract Negotiations	30 days	Mon 9/18/17	Fri 10/27/17



C:\Users\JNH\Documents\C800\System Replace\Timeline - Schedule\Master Schedule 11_22_2016 JH.mpp

Communications System Replacement Project
November 22, 2016

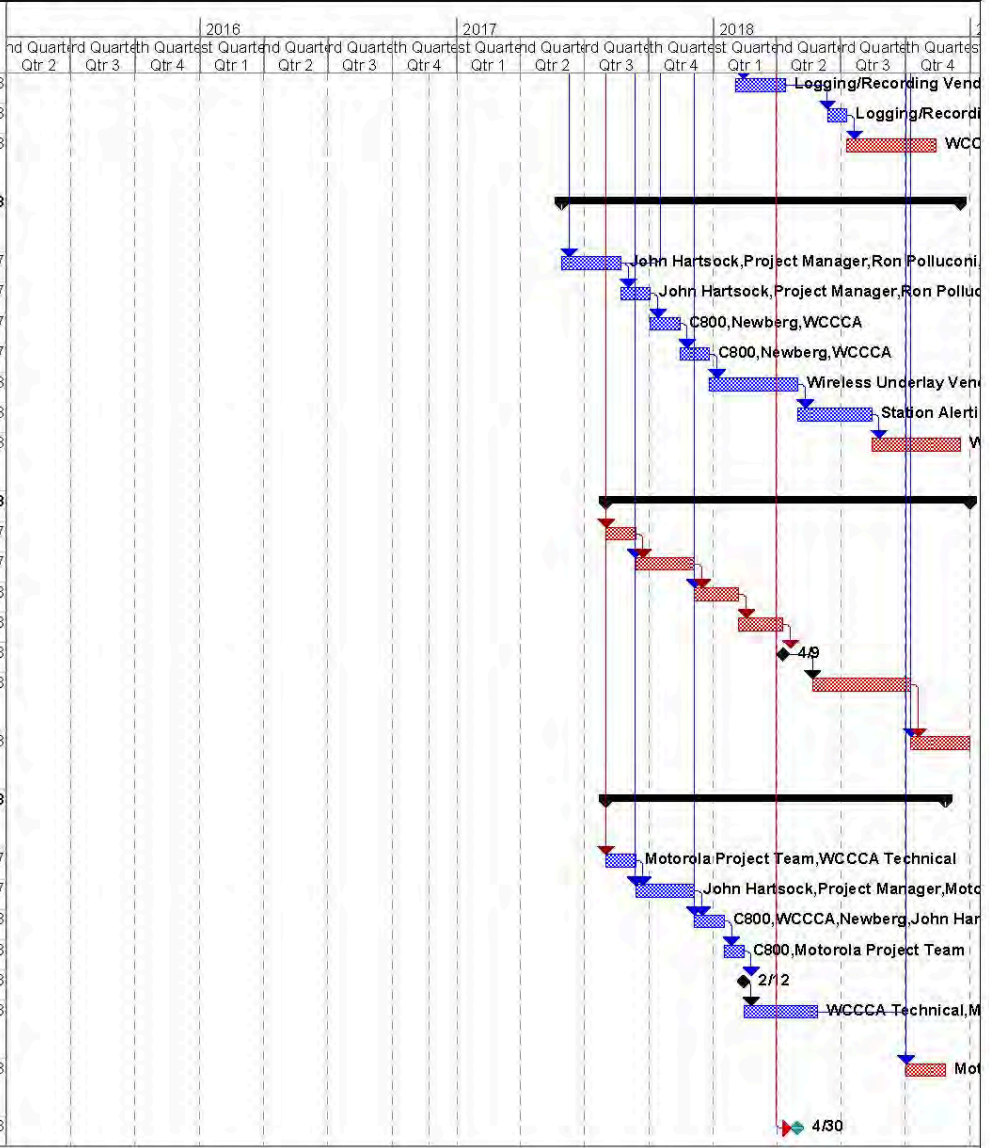
ID	Task Name	Duration	Start	Finish
65	Signed Contract	0 days	Fri 10/27/17	Fri 10/27/17
66	Subscriber radios manufacturing/shipping	8 wks	Mon 10/30/17	Fri 12/22/17
67	Existing Subscriber Radios upgraded	65 days	Mon 1/22/18	Fri 4/20/18
68	New Subscribers radios Field Install and Acceptance	22 wks	Mon 12/25/17	Fri 5/25/18
69	Infrastructure Final Design, Manufacturing and Staging	20 wks	Mon 12/11/17	Fri 4/27/18
70	Infrastructure Ship, Install, Burn-in, configure, acceptance test, cut over	24 wks	Mon 5/28/18	Fri 11/9/18
71	**Upgrade or Replace P25 IV&D Radio/Dispatch Consoles**	**406 days**	**Fri 6/9/17**	**Fri 12/28/18**
72	Write a detailed Scope of work for each system element	60 days	Fri 6/9/17	Thu 8/31/17
73	Negotiate/validate design and pricing	30 days	Fri 9/1/17	Thu 10/12/17
74	Contract Negotiations	30 days	Fri 10/13/17	Thu 11/23/17
75	Signed Contract	0 days	Thu 11/23/17	Thu 11/23/17
76	Radio Consoles Final Design, Manufacturing and Staging	15 wks	Mon 12/11/17	Fri 3/23/18
77	Infrastructure Ship, Install, Burn-in, configure, acceptance test, cut over	20 wks	Mon 8/13/18	Fri 12/28/18
78	**Major Systems Operational**	**0 days**	**Fri 12/28/18**	**Fri 12/28/18**
79	**SMART PHONE Trunking and WAVE Dispatch**	**370 days**	**Tue 8/1/17**	**Mon 12/31/18**
80	Determine final capacities, subscribers, and fee structure	30 days	Tue 8/1/17	Mon 9/11/17
81	Write a detailed Scope of work for each system element	60 days	Tue 9/12/17	Mon 12/4/17
82	Negotiate/validate design and pricing	60 days	Tue 12/5/17	Mon 2/26/18
83	Contract Negotiations	30 days	Tue 2/27/18	Mon 4/9/18
84	Signed Contract	0 days	Mon 4/9/18	Mon 4/9/18
85	SMART Phone System Final Design, Manufacturing and Staging	8 wks	Tue 5/22/18	Mon 7/16/18
86	SMART Phone Ship, Install, Burn-in, configure, acceptance test, user training	6 wks	Tue 11/20/18	Mon 12/31/18
87	**Paging, Messaging, P25 Fire Station Alerting Systems upgrade/replacement**	**354 days**	**Tue 8/15/17**	**Fri 12/21/18**
88	Write a detailed Scope of work for each system element	45 days	Tue 8/15/17	Mon 10/16/17
89	Negotiate/validate design and pricing	45 days	Tue 10/17/17	Mon 12/18/17
90	Contract Negotiations	30 days	Tue 12/19/17	Mon 1/29/18
91	Signed Contract	0 days	Mon 1/29/18	Mon 1/29/18
92	P25 Messaging and Alerting System Final Design, Manufacturing and Staging	15 wks	Tue 1/30/18	Mon 5/14/18
93	P25 Messaging and Alerting Ship, Install, Burn-in, configure, acceptance test, user training	8 wks	Mon 10/29/18	Fri 12/21/18
94	**Recording/Logging equipment upgrade/replacement**	**358 days**	**Thu 6/29/17**	**Mon 11/12/18**
95	Write a detailed Scope of work for each system element	36 days	Thu 6/29/17	Thu 8/17/17
96	Develop RFP package	45 days	Fri 8/18/17	Thu 10/19/17
97	Publish/Advertise RFP	30 days	Fri 10/20/17	Thu 11/30/17
98	Vendor Selection and Contracts	45 days	Fri 12/1/17	Thu 2/1/18



C:\Users\JNH\Documents\C800\System Replace\Timeline - Schedule\Master Schedule 11_22_2016 JH.mpp

Communications System Replacement Project
November 22, 2016

ID	Task Name	Duration	Start	Finish
99	Manufacturing and Staging	10 wks	Fri 2/2/18	Thu 4/12/18
100	Equipment Installation	4 wks	Tue 6/12/18	Mon 7/9/18
101	Cut Over to new Station Recording/Logging Equipment	90 days	Tue 7/10/18	Mon 11/12/18
102	**IP based Fire Station Alerting System over IP infrastructure**	**405 days**	**Tue 5/30/17**	**Mon 12/17/18**
103	Write a detailed Scope of work for each system element	60 days	Tue 5/30/17	Mon 8/21/17
104	Develop RFP package	30 days	Tue 8/22/17	Mon 10/2/17
105	Publish/Advertise RFP	30 days	Tue 10/3/17	Mon 11/13/17
106	Vendor Selection and Contracts	30 days	Tue 11/14/17	Mon 12/25/17
107	Manufacturing and Staging	18 wks	Tue 12/26/17	Mon 4/30/18
108	Equipment Installation	15 wks	Tue 5/1/18	Mon 8/13/18
109	Cut Over to IP underlay infrastructure and station equipment	90 days	Tue 8/14/18	Mon 12/17/18
110	**Site on Wheels (wide and ST modes)**	**370 days**	**Tue 8/1/17**	**Mon 12/31/18**
111	Determine final requirements and design	30 days	Tue 8/1/17	Mon 9/11/17
112	Write a detailed Scope of work for each system element	60 days	Tue 9/12/17	Mon 12/4/17
113	Negotiate/validate design and pricing	45 days	Tue 12/5/17	Mon 2/5/18
114	Contract Negotiations	45 days	Tue 2/6/18	Mon 4/9/18
115	Signed Contract	0 days	Mon 4/9/18	Mon 4/9/18
116	System Final Design, Manufacturing and Staging	20 wks	Tue 5/22/18	Mon 10/8/18
117	Ship, Install, Burn-in, configure, acceptance test, user training	12 wks	Tue 10/9/18	Mon 12/31/18
118	**Dispatch on Wheels (wide and Control Station modes)**	**345 days**	**Tue 8/1/17**	**Mon 11/26/18**
119	Determine final requirements and design	30 days	Tue 8/1/17	Mon 9/11/17
120	Write a detailed Scope of work for each system element	60 days	Tue 9/12/17	Mon 12/4/17
121	Negotiate/validate design and pricing	30 days	Tue 12/5/17	Mon 1/15/18
122	Contract Negotiations	20 days	Tue 1/16/18	Mon 2/12/18
123	Signed Contract	0 days	Mon 2/12/18	Mon 2/12/18
124	System Final Design, Manufacturing and Staging	15 wks	Tue 2/13/18	Mon 5/28/18
125	Ship, Install, Burn-in, configure, acceptance test, user training	8 wks	Tue 10/2/18	Mon 11/26/18
126	New Building or Reconstruction and Fit up Completed	0 days	Mon 4/30/18	Mon 4/30/18



C:\Users\JNH\Documents\C800\System Replace\Timeline - Schedule\Master Schedule 11_22_2016 JH.mpp

WCCCA/C800 Communications Systems Replacement Plan

P25 Land Mobile Equipment Sourcing Proposal

WCCCA/C800
Proposed Sole Source Proposal

WCCCA/C800 Staff are recommending that the agencies enter into a Sole Source Procurement with Motorola Solutions as opposed to entering into an RFP process for the P25 LMR infrastructure, dispatch systems, and subscriber radios.

Key point: It is our intention to enter into a sole source procurement Agreement with Motorola Solutions Incorporated to purchase an upgrade to the existing WCCCA/C800 Land Mobile Radio equipment, Dispatch Center equipment, Subscriber (system user) equipment, Recording Systems, Asset Management Systems, Backup Dispatch and Repeater systems, and National and State interoperable communications equipment.
If at any time we have evidence, at our sole determination, that Motorola is not negotiating in good faith we may terminate from the design and negotiation processes and develop and publish a competitive bid or enter into an RFP process.

WCCCA/C800
Proposed Sole Source Proposal

Cost/Price Validation

- WCCCA/C800 has copies of the Portland, Salem, and CRESA contracts with Motorola for reference. In addition a member of the WCCCA Technical Staff was on each of the RFP processes as an evaluator. As such we have all of the technical evaluation materials and resulting outcomes…these materials provide a basis for defining clear and measurable deliverables and related project costs.
- This level of visibility provides WCCCA/C800 with a clear vision into requirements driving Systems, Processes, Equipment, Engineering/Design, Testing, and Quality and most importantly the resulting costs.

WCCCA/C800
Proposed Sole Source Proposal

Leveraging the WCCCA/C800 Investment in Motorola Technologies

WCCCA/C800 made a necessary investment in current Motorola P25 LMR technology in 2011/2012 when it upgraded from a failing, obsolete, and unsupported Circa 1998 Zone Controller with a then current Motorola P25 LMR Zone Controller with P25 (current and supported technology).

The upgrades to date include:

- P25 redundant Zone Controller
- P25 Digital system adapters that all the use of the existing Analog communications infrastructure.
- P25 Digital system adapters that allowed the use of existing Analog Dispatch equipment.
- An Inter-Subsystem Interface (ISSI) that is interconnected to the City of Portland P25 Zone Controller allowing for "seamless" roaming of Public Safety personnel anywhere where the WCCCA/C800 and City of Portland's system provides coverage.
    - In addition to the connection to the City of Portland additional ISSI connections were purchased with additional interfaces that will connect to the CRESA (Clark Regional Emergency Services Agency) Motorola P25 system in Vancouver, WA, and to the City of Salem's Motorola P25 system creating a regional wide area interoperable Public Safety communications system. Sometimes referred to as a System of Systems.
- One (1) P25 digital repeater site.

The WCCCA/C800 initial investment in this upgrade was **$2.2 million.**
Over the past year the WCCCA/C800 and the Public Safety user community upgraded over 500 (approximately 10%) of their Motorola radios to current technologies. This was to replace circa early 1990's radio equipment that was no longer supported or reliably repairable.

In addition to Public Safety Radios this purchase included

- An additional P25 digital repeater site.
- One (1) Key Management Facility (KMF). This KMF allows WCCCA/C800 technical staff to enable and support our system user's ability to interoperate with our encrypted regional partners.

These upgrades/purchases amounted to an investment of **$2.3 million.**

WCCCA/C800
Proposed Sole Source Proposal

Intangible Investment:

WCCCA/C800 has a significant intellectual investment in staff training and experience with equipment and processes related to Motorola equipment and technologies. Leveraging this investment reduces project implementation risk and costs and will increase efficiencies when compared to starting over with different technologies, equipment and processes.

Summary of the RFP Processes in NW Oregon over the past four (4) years

The City of Portland hired a consultant to create and administrate an RFP process

- The RFP was published November 2012
- Three Qualified Proposers responded
- Motorola Won the Procurement and entered into a contract with Portland

Clark County hired a consultant to create and administrate an RFP Process

- The RFP was published March 2014
- Four respondents and proceeded with two of them Qualified Proposers responded
- Motorola Won the Procurement and entered into a contract with Clark County (CRESA)

The City of Salem hired a consultant to create an RFP. The City's Public Works Department administrated the RFP process.

- The RFP was published May 2014
- Two Qualified Proposers responded
- Motorola Won the Procurement and entered into a contract with the City of Salem

WCCCA/C800
Proposed Sole Source Proposal

Summary of the RFP Processes in NW Oregon over the past four (4) years continued

All referenced contracts remain in force at this time and each are under different phases of design and or construction.
Puget Sound Emergency Radio Network (PSERN) in King County entered into a Contract with Motorola December 2014. This project is similar in scope and scale to the WCCCA/C800 project and will be used for cost comparison.

If we were to go to RFP the following are points that may impact our current timeline.

- Estimated time to develop an RFP – 120 days
- Estimated Cost for consultant to create the RFP and consult on its review and award processes - $100 – $350K. Costs vary greatly depending upon project scope.
- Estimate time to evaluate and award a contract – 160 days
  - Using 252 usable work days in a year the RFP process would likely exceed 1 year.
  - This delay would result beginning the final design, manufacturing, installation, qualification, and cutover resulting in an increase in risk of systemic failure of the circa 1990's technology that much of our system still relies upon.

WCCCA/C800
Proposed Sole Source Proposal

Transition / Cut over benefits

Motorola Subscriber Radios are fully compatible with the current Motorola Analog System and will be fully compatible with a new Motorola P25 System.

- This provides a significant benefit by allowing staff to prepare and distribute radios into the field well in advance of the cut over to the new P25 infrastructure. As such Cut Over for the field users will only require a simple change of modes on their radios and they will be operating on the New P25 system. Should there be a severe problem with the cut over the field users can go back to the existing analog infrastructure and operate there until issues are resolved.

Cut over using other typical methods result in;

- Training issues resulting in confusion on how to operate a new radio.
- The potential to carry or have installed two radios for some period of time.

Technical Support

Due to the existing Motorola P25 Systems base in the Portland UASI region the level of technical personnel/support has substantially increased which substantially enhances our support capabilities which result in an increase in overall service performance and reduced down times.

WCCCA/C800
Proposed Sole Source Proposal

Summary

We truly believe it is in the best interest of WCCCA/C800 and the First Responders to pursue a Sole Sourcing strategy with Motorola . This recommendation is base upon the following key points.

- WCCCA/C800 made a necessary investment in current Motorola P25 LMR technology in 2011/2012 when it upgraded from a failing, obsolete, and unsupported Circa 1998 Zone Controller with a then current Motorola P25 LMR Zone Controller with P25 (current and supported technology). Current investment approximately $3 million.
- WCCCA/C800 has a significant intellectual investment in staff training and experience with equipment and processes related to Motorola equipment and technologies. Leveraging this investment reduces project implementation risk and costs and will increase efficiencies when compared to starting over with different technologies, equipment and processes.
- A key finding of the 9/11 commission study on interoperable communications was the need for adjacent agencies, that may respond in support of a man made or natural disaster, to achieve seamless communications. This solution provides for the best interoperable solution for the UASI Region with regards to full systems integration into a Regional System of Systems.
- There is no loss of negotiating power as we retain the ability to enter into an RFP process.
- Proposal provides for a streamlined, cost effective, and time efficient procurement and implementation that will result in a substantially lower risk of catastrophic system failure(s).
- Public Safety personnel will experience a near seamless transition and greater functionality moving from the current analog system to the new P25 system
- Full access to Motorola technical design and project management personnel during the negotiating process results in reduced upfront and long term project costs.

DRAFT

PROJECT STATUS

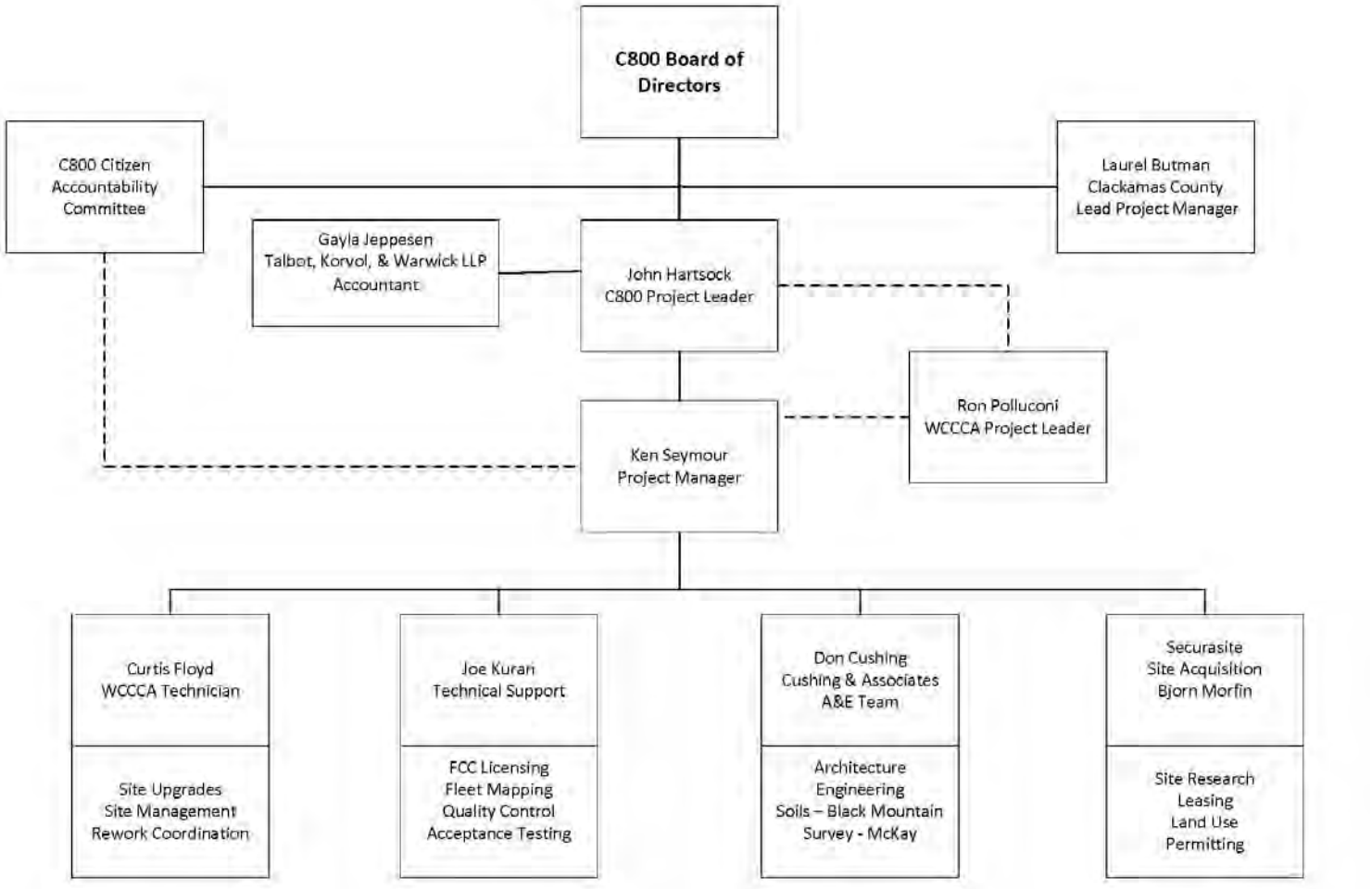
C800 Communication System Upgrade Project

Project Leader: John Hartsock – Manager C800

Project Manager: Ken Seymour – WCCCA/C800 Contractor

Date: November 28, 2016

Project Team



Project Status Summary

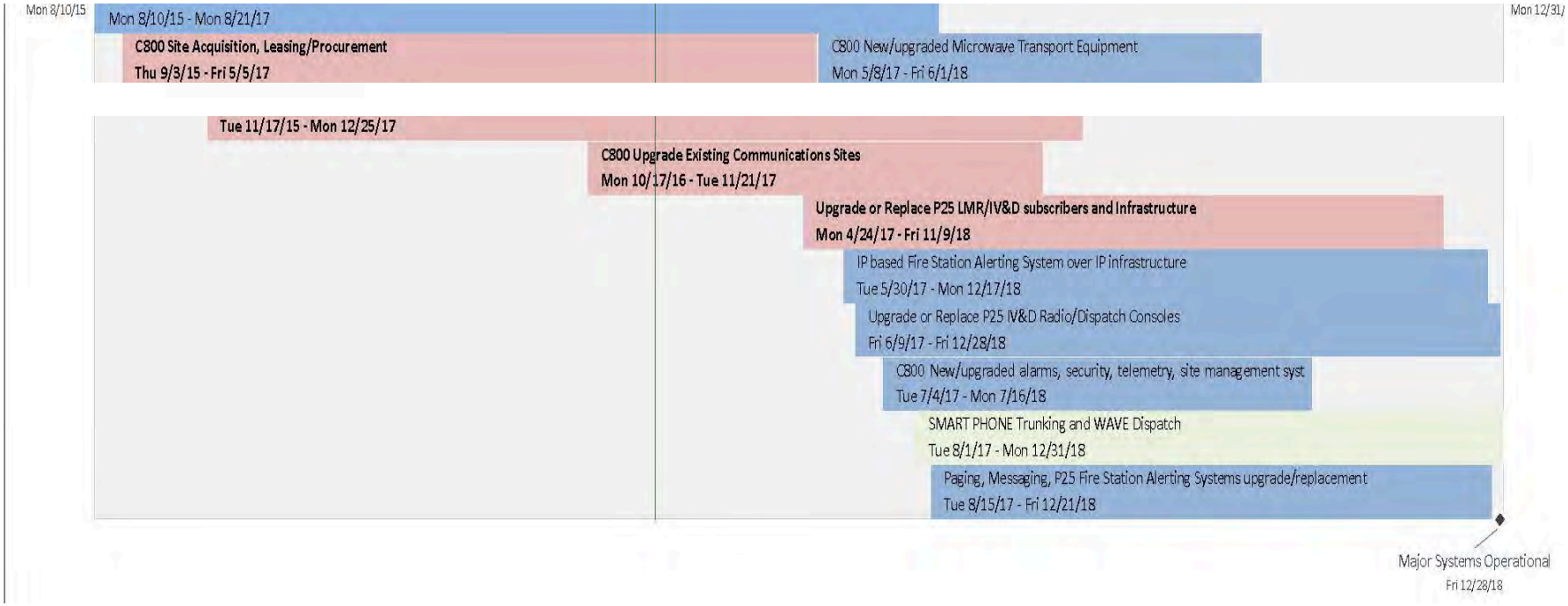
- **Project Element Status**
  - Design
    - A&E firm under contract and working on new site development and site upgrades for existing sites
    - Revising coverage and microwave designs as site acquisition progresses
  - Radio System Procurement - On Hold pending procurement direction
  - Site Acquisition/Land Use
    - 14 Sites to be Developed
    - 4 USFS sites / 2 BLM Sites Preliminary applications complete awaiting agency direction
    - 4 in lease negotiations – leases expected by end of January 2017
    - 3 completed site leases agreements with landlords
    - 1 lease complete – site constructed (Sawtell)
  - Existing Sites Upgrades
    - R56 Studies and tower engineering data assembled in preparation for seismic and loading review/upgrade / tower mapping and as-built documentation being prepared
  - New Construction
    - Developing specifications for all key elements in preparation for RFP's spring 2017
  - Upgrades to existing and deployment of new radios
    - No vendor selected yet
  - Equipment installation for new and upgraded sites
    - No Vendor Selected yet
  - Coverage and Acceptance Testing
    - TBD
  - Cut Over
    - TBD

Project Schedule

The Project has been delayed by lack of clear direction on procurement for radio equipment and microwave equipment.

- Developing an RFQ process for radio engineering, equipment, and services

Hiring of the Project Manager is complete



Budget

C800 Radio System Upgrade

Project Financial Status

Project:	**C800 Radio System Upgrade**
Date Original:	10/1/2015 **Date Updated: Dec 5,2016**
Project Manager:	Ken Seymour

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
Soft Cost								
Site Acquisition Consulting - Quest	60,000	30,000	40,000	0	95.47%	70,000	(10,000)	66,832.31
Site Acquisition Consulting / Permits - Securasite	270,000	268,500		1,500	38.24%	270,000	0	103,260.33
Site Planning - Cushing	400,000	317,178		80,000	56.64%	397,178	2,822	224,943.26
Geotechnical / Environmental Consulting – Black Mtn	200,000	89,100		100,000	34.03%	189,100	10,900	64,350.00
Survey - McKay	75,000	50,160		20,000	43.64%	70,160	4,840	30,620.00
USFS Land Use Fees	10,000			10,000	0.00%	10,000	0	0.00
Land Use Fees	25,000	268		20,000	1.32%	20,268	4,732	268.00
Plan Check / Permit Cost	60,000			60,000	4.62%	60,000	0	2,769.56
Printing	2,500			2,500	0.00%	2,500	0	0.00
Bid Advertising	3,500			3,500	0.00%	3,500	0	0.00
Materials Testing & Inspection	40,000			40,000	2.81%	40,000	0	1,123.75
Project Management	300,000	279,000		20,000	0.00%	299,000	1,000	0.00
Legal Fees	30,000	12,000		18,000	21.92%	30,000	0	6,575.00
Licensing	20,000			20,000	0.00%	20,000	0	0.00
Miscellaneous	10,000	700		9,000	24.74%	9,700	300	2,400.00
Sub-Total Soft Cost	**1,506,000**	**1,046,906**	**40,000**	**404,500**	**33.74%**	**1,491,406**	**14,594**	**503,142**
Construction Cost								
Site Construction	9,200,000	320,339		8,879,661	2.55%	9,200,000	0	234,975.82
Generator	5,800,000			5,800,000	0.00%	5,800,000	0	0.00
48VDC	1,065,000			1,065,000	0.00%	1,065,000	0	0.00
Lake Oswego Antenna	18,000	17,500	0	0	100.07%	17,500	500	17,511.75
Existing Sites	100,000	6,400		93,600	6.40%	100,000	0	6,400.00
Sub-Total Construction Cost	**16,183,000**	**344,239**	**0**	**15,838,261**	**1.60%**	**16,182,500**	**500**	**258,887.57**

Project: **C800 Radio System Upgrade**
Date Original: 10/1/2015 **Date Updated: Dec 5,2016**
Project Manager: Ken Seymour

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
Equipment Costs								
Simulcast Equipment	14,928,000			14,928,000	0.00%	14,928,000	0	0.00
Master Site Equipment	3,534,000			3,534,000	0.00%	3,534,000	0	0.00
Console	1,650,000			1,650,000	0.00%	1,650,000	0	0.00
Back up Dispatch	426,000			426,000	0.00%	426,000	0	0.00
Spares	1,200,000			1,200,000	0.00%	1,200,000	0	0.00
Paging	373,000			373,000	0.00%	373,000	0	0.00
Subscriber Radios	5,000,000	1,515,649		3,484,351	39.39%	5,000,000	0	1,969,352.00
Unified Push to Talk	188,000			188,000	0.00%	188,000	0	0.00
Asset Management	119,000			119,000	0.00%	119,000	0	0.00
Post Warranty	3,100,000			3,100,000	0.00%	3,100,000	0	0.00
System Refresh / Upgrade	2,700,000			2,700,000	0.00%	2,700,000	0	0.00
Test Equipment	100,000			100,000	0.00%	100,000	0	0.00
Microwave	3,368,000	406,169		2,961,831	11.59%	3,368,000	0	390,406.05
Security System	1,364,000			1,364,000	0.08%	1,364,000	0	1,079.96
Subtotal Equipment Costs	**38,050,000**	**1,921,818**	**0**	**36,128,182**	**6.20%**	**38,050,000**	**0**	**2,360,838**
Bond Cost	300,000	290,372		0	100.00%	290,372	9,628	290,372
Subtotal Project Cost	**56,039,000**	**3,603,335**	**40,000**	**52,370,943**	**6.09%**	**56,014,278**	**24,722**	**3,413,240**
Contingency	**2,961,661**			**2,961,661**	**0.00%**	**2,961,661**	**0**	
Total Project Cost	**59,000,661**	**3,603,335**	**40,000**	**55,332,604**	**5.79%**	**58,975,939**	**24,722**	**3,413,239.59**

Premium **7,165,794**

Next Steps – Quarterly Outlook

- Develop Design and Requirements in preparation for RFP's for:
  - Towers – December 2016
  - Shelters – December 2016
  - Generators - January 2017
  - DC Power Systems – February 2017
- Tower mapping of existing sites – January 2017