

**ORANGE COUNTY
BOARD OF COMMISSIONERS**

ACTION AGENDA ITEM ABSTRACT

Meeting Date: May 2, 2017

**Action Agenda
Item No. 7-b**

SUBJECT: Countywide Radio Communications Needs Assessment and Alternatives Report

DEPARTMENT: Emergency Services

ATTACHMENT(S):
Executive Summary

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PURPOSE: To receive a presentation on the Countywide Radio Communications needs assessment and alternatives analysis as well as potential cost share models for sharing the cost of the system with public safety agencies in the County, and provide feedback on the project and the funding recommendations currently contained in the Manager's Recommended Capital Investment Plan.

BACKGROUND: The existing Orange County public safety radio communications systems have served first responder agencies adequately for many years. However, multiple system components are at or near end of life, spare parts are hard to find, and vendor support will be ending in the next few years. Existing radio systems do not have the built-in redundancy that prevents system outages in the event of component failure or other disasters. As Orange County continues to grow, first responder agencies have recognized that current public safety radio systems do not meet today's radio coverage, capacity, and resiliency requirements.

Recognizing these factors, the County engaged Federal Engineering, Inc. (FE) in a multiphase approach to conduct a system evaluation, planning and alternatives development study. This presentation to the Board of Commissioners will summarize the work completed during the initial evaluation and planning phase. The second step in the evaluation and planning phase involves a detailed evaluation of the selected alternative radio system approaches, developing migration plans, and finalizing budgetary cost estimates. Based on the funding approach approved in the Capital Investment Plan, subsequent phases of this radio project could include the development of a competitive request for proposals, assistance during the procurement process, technical evaluations of vendor proposals, and vendor negotiations assistance resulting in an executed vendor contract.

FINANCIAL IMPACT: There is no direct financial impact with receiving the report. The Capital Investment Plan contains a funding recommendation for phasing in the radio project over time. This presentation is intended to inform the Board's deliberations on project funding.

SOCIAL JUSTICE IMPACT: The following Orange County Social Justice Goal is applicable to this item:

- **GOAL: CREATE A SAFE COMMUNITY**

The reduction of risks from vehicle/traffic accidents, childhood and senior injuries, gang activity, substance abuse and domestic violence.

This project will support all field responders by providing a reliable radio communications system that provides adequate coverage, capacity and growth in response to emergencies and non-emergencies.

The project also supports all field responders and mutual aid assistance in providing the technology needed to achieve the mission of protecting residents and responders.

RECOMMENDATION(S): The Manager recommends that the Board receive the Countywide Radio Communications Needs Assessment and Alternatives Report and provide input on the project, cost sharing models, and funding recommendations.

Executive Summary

The existing Orange County public safety radio communications systems have served first responder agencies adequately for many years. However, multiple system components are at or near end of life, spare parts are hard to find, and vendor support will be ending in the next few years. Existing radio systems do not have the built-in redundancy that prevents system outages in the event of component failure or other disasters. As Orange County continues to grow, they have recognized that current public safety radio systems do not meet today's radio coverage, capacity, and resiliency requirements.

Recognizing these factors, the County engaged Federal Engineering, Inc. (**FE**) in a multi-phased approach to system evaluation, planning, and alternatives development.

Previous phases of the project focused on defining needs and requirements, and review of alternatives for a replacement radio system. This phase of the project provides an in-depth analysis of the Orange County (County) selected replacement radio solution.

Following detailed technical meetings and discussions, the Orange County Radio Team obtained consensus and agreement of all user agencies on the replacement radio solution and the steps that should be followed for implementing the system. The County selected a replacement radio solution that was a combination of previously identified system approaches. The Orange County Radio Team decided that the long-term solution that best meets County needs and requirements is a 700/800 MHz P25 system that will provide communications for all public safety agencies, and provide for the future addition of public service and other agencies such as schools, public works, animal control, Orange Water and Sewer Authority (OWASA), and transit. The County decided that the replacement radio solution will be implemented in steps over time. In addition, the County selected a VHF system for use by volunteer fire departments.

The County will continue to use the Voice Interoperability Plan for Emergency Responders (VIPER) system for backup and interoperable communications, but will transfer the day-to-day communications to the new Orange County 700/800 MHz P25 system.

Step 1

Step 1 of the selected replacement radio solution consists of sharing the system control equipment (core) of Durham County, constructing four sites in the Chapel Hill and Carrboro area, and connecting the new system to the existing dispatch consoles. By sharing a system, the capital costs associated with the system control equipment, which are substantial, are eliminated. Sharing the core equipment will require development and execution of an interlocal agreement between Orange County and Durham County (the system control equipment owner). This agreement will contain the roles and responsibilities of both counties, and the payments required.



In this step the four sites constructed will provide >99% mobile and 99% portable on-street radio coverage within the geographic borders of Chapel Hill and Carrboro.

Step 2

Step 2 includes constructing four VHF sites that will provide radio coverage to most of the County. The volunteer fire departments will use this system for voice communications and paging. A basic premise for the new replacement radio solution was that the 700/800 MHz and VHF sites are at the same locations, leveraging towers, shelters, power equipment, and backhaul microwave. An option for Step 2 would include adding the 700/800 MHz at the VHF sites.

The four VHF sites constructed will provide for 99% mobile, and 66% portable on-street radio coverage within the geographic border of Orange County.

Step 3

Step 3 consists of constructing the balance of 700/800 MHz P25 sites in the County. The long-term solution estimates that a total of 17 sites will be needed to provide reliable radio coverage to the County. The 17 sites will significantly improve in-building coverage. This step will consist of building out the 13 remaining sites.

Following the completion of construction of the 17-site 700/800 MHz replacement radio solution, the system will provide >99% mobile and 96% portable on-street radio coverage within the geographic border of Orange County.

We developed a detailed transition/migration plan, included in this report. This plan addresses each agency in each step of the construction. This plan indicates which system the agency will use for primary day-to-day communications, and which agency portables and mobiles will require programming/reprogramming for use of the new systems.

Using our in-house cost analysis tool, **FE** prepared high-level budgetary cost estimates for equipment, installation, user radios, and site improvements for each of the construction steps. These estimates reflect results from previous activities in this project, our knowledge of the County system, our experience designing radio systems comparable to this project, and publicly available industry information. This cost analysis takes advantage of our team's knowledge base and should prove to be invaluable during the development of budgets and the completion of procurement activities with system vendors.

Actual system costs are highly dependent on final system design choices as well as conditions in the land mobile radio market during the system procurement phase.



Therefore, **FE's** budgetary estimates are conservative in nature so that the vendor proposal pricing does not exceed the estimates. The cost estimates prepared for the alternatives reflect non-discounted (list) pricing. Frequently, system vendors also provide additional discounts for system and subscriber purchases of this size and scope. System discounts of 20% to 25% are common (and mirror many state contracts), and **FE** has seen discounts of up to 40% to 45%. However, it is not possible to forecast the level of discount vendors will offer at the time of proposal submission.

Table A reflects the estimated costs for each step, and includes optional system features in Step 1 that may be purchased.

Table B shows the estimated costs for constructing four 700/80 MHz sites during Step 2 which would be collocated at the VHF sites. These four sites can be added to Step 2 if the County elects. The costs for these four sites are included in the Step 3 amounts shown in Table A.

Table A – Estimated Cost per Step

Estimated Costs per Step			
Step	Equipment	Services	Extended
1	\$4,634,000	\$2,453,000	\$7,087,001
1 Optional	\$664,000	\$354,000	\$1,018,000
2	\$2,474,000	\$1,323,000	\$3,797,002
3	\$11,713,000	\$6,191,000	\$17,904,003
TOTAL	\$19,485,000	\$10,321,000	\$29,806,006

Table B – Estimated Cost for four sites (part of Step 2 or Step 3)

Estimated Costs in Step 3 that could be moved to Step 2			
Step	Equipment	Services	Extended
2A	\$975,000	\$515,000	\$1,490,000

Some items the County should consider during the review and evaluation of this Report include the following:

- Use of the Durham County core equipment, while saving the costs of purchasing the core equipment, requires that the new County replacement radio solution system infrastructure be from the same vendor as the existing core equipment.



- New sites constructed will be equipped with microwave backhaul for interconnecting the sites to the core equipment and dispatch consoles. This microwave backhaul will have excess capacity that may be used for other County purposes.
- New sites constructed that include new towers should include the ability to support future growth (additional antennas and users). The County can use the future growth capacity to support expansion of the radio system(s) or to support other wireless systems, such as broadband.
- Building the system over time does not provide a solution that meets all radio coverage needs in one step. The County will not recognize full countywide radio coverage improvements. This multi-step approach requires a more complex transition/migration plan for each step.

Following County approvals of the selected replacement radio solution plan and funding, the County should proceed to the next phases of the project, which consist of:

- Preparing technical specifications and a request for proposal (RFP) for Step 1
- Executing an interlocal agreement with Durham County for core equipment use
- Evaluation of vendor proposals
- Vendor contract and price negotiations, and contract award
- Step 1 system implementation

