

EMERGENCY COMMUNICATIONS



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FY2004-2010

1. BACKGROUND ISSUES

The Emergency Communications element of the capital plan is comprised of three projects concerning emergency radio communications, computer aided dispatching, and back-up emergency communications. All of these initiatives are interconnected and comprise key components of the infrastructure needed to effectively handle public safety communications in emergency situations.

Radio Communications System

This project addresses the emergency communications needs of public safety agencies in Wake County. The project consists of a partnership between Wake County, the North Carolina Highway Patrol, and the City of Raleigh to provide an expanded 800 MHz radio communications system. The existing Raleigh/Wake County communications center is being refurbished with upgraded equipment to handle the enhanced features that will be installed. This project will expand communications capacity using a radio system operating in the 800 MHz frequency range for Wake County public safety use including, volunteer fire departments, emergency medical services, Sheriff, other current county government users, and the Highway Patrol. In addition, all towns in the county will benefit significantly by having access to the communications infrastructure currently being installed. In FY2002, the Board of Commissioners approved a major communications improvement contract and work on the project commenced.

Computer Aided Dispatch

In FY2000, Wake County and the City of Raleigh initiated a cooperative effort with all towns that participate in the operation of the Raleigh/Wake Emergency Communications Center to plan, design and install a new Computer-Aided Dispatch (CAD) System. The desired effect of the new dispatching initiative is to expedite the service delivery of all local government public safety agencies (law enforcement, fire and emergency

medical services), and selected non-public safety departments. The Geographic Information System (GIS) based mapping system will allow the visual display of incidents, locations of various public safety resources, display of user agencies' geographic boundaries, and landmarks. This visual capacity will facilitate the dispatch of the nearest available response unit irrespective of political boundaries. It will be based upon fault-tolerant or fully redundant hardware and software technology while providing an up time of 99.95 percent or greater.

Back-up Emergency Communications Center

Currently, the City of Raleigh has primary responsibility for operation of the main Emergency Communications Center (ECC) in Wake County. The ECC is located in the basement level of the Municipal Center in downtown Raleigh. The Town of Cary operates a smaller communications center, located at the Municipal Complex in the downtown business district of Cary. The Cary facility handles emergency communications for Cary and Morrisville. Neither facility has the equipment necessary to fully back up the other in the event of a catastrophic emergency that renders one of the communication centers unusable. Over the years, there have been discussions between Wake County, Raleigh, and Cary concerning the importance of developing reliable back-up communication plans and eliminating redundant dispatching capability. The issue has recently received more attention following the two separate waterline failure/flooding events in Durham, which required their ECC to be vacated for several days. In addition, there is a heightened sense of urgency because of the terrorist attacks on September 11, 2001. Over the years, Wake County has attempted to facilitate a collaborative solution to this critical issue. Various partnerships were explored, including the development of a back-up ECC as part of a new Wake County Emergency Operations Center. In Summer 2002, Raleigh and Wake County tentatively agreed to jointly explore the possibility of developing a fully redundant back-up ECC. The facility would also serve as a training facility for dispatch per-

sonnel. Raleigh subsequently awarded a construction contract to build a new fire station on Barwell Road with an additional 2,700 square feet of "shell" space, which could eventually be completed to function as a back-up ECC. City and County staff have been working on plans and cost estimates for possibly finishing the space to serve as the back-up facility. An interlocal agreement will be considered in FY2004 for jointly developing the facility. As currently contemplated, this facility would provide back-up communications for Wake County and all towns.

2. PROGRAM & FACILITY GOALS

The primary goals of the Emergency Communications element of the CIP are:

- Provide more effective emergency service delivery with improved interagency communications at the scene of an event.
- Increase the efficiency and effectiveness of managing and coordinating public safety and law enforcement resources in Wake County.
- Improve emergency service delivery response times through more efficient and effective dispatching.
- Ensure redundancy in critical emergency communications services and facilities.

3. COMPREHENSIVE FACILITY PLAN

Radio Communications System

In FY2001, a technical review team of communication engineers, municipal and county staff and managers, and representatives from all major radio system manufacturers analyzed Wake County's radio infrastructure and future needs. The comprehensive analysis indicated the need for a trunked radio communications system operating in the 800 MHz portion of the radio spectrum.

In recent years, several county departments (including General Services, Public Safety, and the Sheriff, Court and Detention Services) have used 800 MHz radio communications for interdepartmental and interagency

communications. The NC Highway Patrol purchased the trunked 800 MHz radio equipment used during the 1999 World Special Olympics Games. Through a partnership agreement between Wake County and the NC Highway Patrol the system installed in 1999 will serve as part of the foundation of the radio communications system capital expansion project.

The 800 MHz system will improve emergency communications in a number of ways. First, it will allow public safety agencies to communicate directly at the scene of an event. In addition, radio communications will be improved by addressing current problems regarding interoperability coverage problems (areas in Wake County where radios cannot operate), overcrowding of channels, and channel interference (which results in long "wait" times when radio users must hold their transmission until a channel clears).

The system currently being installed can be expanded to include the addition of Cary and Raleigh radio users. Once these two user groups migrate to the County system, communications capabilities will be further enhanced.

Computer Aided Dispatch

In FY2000, Wake County and the City of Raleigh appointed a team of staff to investigate, select and implement a new computer-aided dispatch system to replace the nine-year-old CAD system being used in the Raleigh/Wake Emergency Communications Center. A consultant was retained to assist this team in updating the "needs analysis" which had been previously prepared for Wake County.

The team and consultant developed a specification for the system and solicited proposals in FY2001. Through a detailed proposal analysis and "scoring" system, the team selected Printrak Inc. to design, manufacture, install and test a new CAD system. The system has been installed and comprehensive system testing and user training have been completed. Final acceptance testing and conversion to new CAD is planned for late in the fourth quarter of FY2003.

Back-up Emergency Communications Center

A number of public safety related emergency operations improvement initiatives have been planned concurrently and must be closely coordinated to yield the desired results. These include the installation of the CAD system, 800 MHz communications system, construction of a back-up ECC, and improvements to the Wake Emergency Operations Center. The operational status of back-up power generator systems at the County's five designated disaster shelters will be monitored through the same control system (MOSCAD), which will monitor critical components of the 800 MHz radio system. CAD and 800 MHz radio software and hardware will be fully integrated for installation at each of the dispatch workstations being replaced at the Raleigh/Wake County ECC. If the County and Raleigh finalize an agreement for upfitting the Barwell Road back-up ECC, specific CAD and radio equipment will be installed for emergency use in the event of a major failure or evacuation at the main ECC. CAD and 800 MHz radio system components will be installed in the Wake County Emergency Operations Center and in the County public safety system management office to aid in coordinating emergency management functions.

4. SEVEN-YEAR CIP PROGRAM SUMMARY**Radio Communications System**

Funds totalling \$8 million are included over the next two years to complete the implementation of the new 800 megahertz communication system. The design of the system provides for 14 communication channels, with the potential to expand to 33 channels to accommodate other municipal users (such as Cary and Raleigh) in the future. In addition to providing six new towers (includes tower at back-up ECC) and modifications and improvements to eight other existing tower sites, the new system will accommodate analog and digital radios, and provide SmartZone technology utilizing both simulcast and multicast solutions. The project includes modifications to modernize the existing communications consoles in the Raleigh/Wake emergency communications center, including upgrading wiring, some building equipment, and console support systems.

The total project consists of the following major components 1) construction of radio towers, tower support buildings and related improvements; microwave equipment; installation of in-building amplification and mobile repeaters; provision of portable and mobile radio units for public safety, 2) purchase of tone, voice and alphanumeric paging systems and units, 3) a contingency for utility extensions, consultants, and unforeseen expenditures related to the in-building amplification needs, 4) partnership with Cary to expand system to 18 channels.

In accordance with the partnership agreement with the NC Highway Patrol, Wake County is funding all fixed infrastructure costs for the 14-channel system and non-fixed costs for the County-funded public safety agencies. Long-term leases have been executed between the County, the State, and other partners for shared use of existing and future systems and equipment, which comprise the radio system. Recently Cary has expressed interest in partnering with the County to expand the system to 18 channels, thereby increasing capacity to allow Cary public safety and public works radio users to migrate to the County system. In addition, Raleigh has retained a consultant to evaluate the feasibility of expanding the system to 28 channels to meet their emergency communications needs.

Computer Aided Dispatch

The Wake/Raleigh CAD system is being constructed in the following phases: 1) base system installed in FY2002, 2) base system operational and mobile status equipment installed in FY2003, 3) automated voice dispatch system installed after the base system is fully functional, 4) installation of back-up CAD system at Barwell Road Back-up ECC. Prior appropriations for the CAD project total \$3,958,098. The system does not include automated vehicle location (AVL) at this time, but is capable of supporting the addition of AVL at a later date.

Back-up Emergency Communications Center

Developing a back-up ECC has been a long term priority for Wake County. Recently a team of Raleigh and Wake County staff have collaborated on a plan to build and equip this critically important facility. The

facility currently being constructed by Raleigh contains 2,700 square feet and is a separate wing of the new Barwell Road Fire Station. If the Raleigh/Wake plan is approved full capability to back-up the primary ECC located in downtown Raleigh would be available. Appropriate back-up power, security, and other building systems would be incorporated to ensure the facility is suitable for emergency use. Anticipated cost is \$3.34 million. An interlocal agreement, which proposes a 50/50 sharing of this cost, will be presented to the governing Boards of Raleigh and Wake County in Summer 2003. If approved, the back-up ECC will be functional by the first quarter of FY2005.

5. PROJECT ACCOMPLISHMENTS IN FY2003

Radio Communications System

Progress continues in accordance with the originally approved implementation plan. All site infrastructure components and systems have been installed. Six new towers have been designed, fabricated and installed. Modifications and upgrades to eight other towers are complete. All equipment buildings, emergency generators, microwave systems, and site improvements are complete. Radio and paging systems have been manufactured, factory tested and installed in tower equipment buildings. Dispatch consoles, mobile and portable radio units have been ordered and are scheduled for delivery, installation and programming during the first half of FY2004.

Computer Aided Dispatch

During FY2003, 21 new CAD dispatch workstations were installed in the primary ECC in downtown Raleigh. Other significant accomplishments include: processing of nearest station response and run order recommendations for fire and EMS that resulted in over 3,700 new response zones; conversion of 1,200 Police and Sheriff zones as well as the incorporation of the new Raleigh Police "precincts"; Training of dispatchers in the use of new CAD systems and call taking/dispatching was completed; installation of personal computers for CAD inquiry in police, fire, and EMS stations; installation of 50 tear & run printers in fire and EMS stations; and final system acceptance testing.

Back-up Emergency Communications Center

The City of Raleigh awarded a construction contract for building a new facility on Barwell Road in southeast Raleigh to house a fire station and back-up ECC. The back-up ECC part of the facility will not initially be equipped. A communications tower is also being constructed at the site.

County and City staff have worked closely over the past year to assess the back-up capability and support facilities needed at the Barwell Road site. Cost estimates and a draft interlocal agreement for jointly developing the back-up ECC have been prepared. Total projected capital cost for the fully equipped facility is \$3.34 million. The interlocal agreement, as presently drafted, contemplates the City and County sharing this cost equally.

6. FY2004 PROJECT ACTIVITY SUMMARY

Radio Communications System

Portable radios will be delivered and programmed. Mobile units and antenna systems will be installed in vehicles along with desktop units in buildings. In-building amplification system needs will be identified for key facilities and equipment installed as necessary. Control system electronics will be fully installed and tested. Dispatch console equipment and monitors will be installed at the following locations: Raleigh/Wake Main ECC; Raleigh/Wake back-up ECC; Wake emergency operations center; system management office in Wake Office Building. Extensive testing, coverage verification and training will be completed during the last two quarters of FY2004.

Negotiation of the terms and conditions of an interlocal agreement between Wake County and Cary, which will allow Cary to migrate to the County 800 MHz system is expected to be completed early in FY2004. If the agreement is executed, design work to expand the system to 18 channels will be done. A contract would then be finalized with the radio system contractor for manufacturing and installing the equipment needed for the expansion.

Computer Aided Dispatch

Plans for FY2004 include purchasing and installing the Fire/EMS voice alerting system. Assistance will also be provided to the various municipalities that are implementing remote CAD workstations.

Back-up Emergency Communications Center

Execution of an interlocal agreement between Wake County and Raleigh to jointly develop and fund the fully equipped facility is anticipated. Completion of building construction and installation of equipment for the back-up facility would then be completed. Operational testing and training would begin in FY2004, but not be fully completed. These final project activities would be planned to coincide with the completion of the 800 MHz radio system improvements project.

7. SUMMARY OF FUTURE PHASES (FY2005-2010)**Radio Communications System**

Subject to advance execution of a Wake/Cary intergovernmental agreement, the radio communications system will be expanded to 18 channels to enable Cary to migrate to the County system.

Computer Aided Dispatch

No additional capital expenditures are estimated for the period of FY2005-2010. The possibility of investing in AVL technology depends on more detailed scope of the type of technology needed, specific cost estimates, and the development of evaluation criteria for analyzing the costs and benefits of the technology. At this point, funding for AVL has not been included in this capital program.

Back-up Emergency Communications Center

Final testing and training will be completed and the back-up facility will be fully operational, if the Raleigh/Wake interlocal agreement is executed in summer 2003.

8. OPERATING IMPACT

A consultant has been retained to work with the County to address ongoing maintenance and operations cost allocation to user groups.

Radio Communications System

Operation and maintenance costs will be required for the infrastructure including; microwave, transmitters, towers, building, generators, etc. Additionally, mobile and portable units need to be maintained and a replacement plan will need to be developed. Operating system and software upgrades will also require funding after the system is completed. These costs are shown on the financial summary sheet.

Computer Aided Dispatch

Ongoing costs for the system could include: hardware and software maintenance costs, future software customization, training costs, additional hardware and software costs, and personnel costs. Operating costs for the system will be negotiated with City of Raleigh to determine how these costs will be funded.

Back-up Emergency Communications Center

There will be additional operating costs associated with the technology, data, and other issues associated with back-up Emergency Communications Center (ECC) and Public Safety Answering Points (PSAP).

9. RELATIONSHIP TO OTHER PLANS**Radio Communications System**

This project complements the County's partnership with the City of Raleigh to provide a new computer aided dispatch system. Implementation of an 800 MHz trunked radio system will substantially improve interoperability between Wake County public safety agencies and other governmental entities, including NC Highway Patrol, Cary and RDU Airport who already use 800 MHz systems.

Computer Aided Dispatch

A key feature of the system is its ability to interface with the State, County and various municipalities' existing technology systems, thus maximizing the benefits of previous investments. The CAD System will extend a modern telecommunications' network to all Wake County Fire and EMS stations. The Wake County GIS system will have enhanced graphic street centerline files as a result of integrating the new CAD sys-

tem. Automatic Vehicle Location (AVL) technology (if implemented) will be able to locate real-time and track the movement of emergency response vehicles. The CAD system will also meet the requisites of Federal Communications Commission (FCC) docket 94-102/96-264 relating to identification of wireless callers in 911 centers.

Back-up Emergency Communications Center

The back-up ECC project should be integrated and closely coordinated with the Radio Communications and CAD initiatives. Both of these projects include some back-up equipment to be installed and tested in a back-up ECC. The capabilities needed at the back-up facility significantly impacts overall system design and equipment to be purchased as part of the 800 MHz radio project and CAD system.

10. ILLUSTRATIONS



Radio Communications Tower, State Highway Patrol Tower



Radio Communications Tower, Northern Wake County



Radio Communications Tower, Research Triangle Park



Radio Communications Tower, Wake Forest

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11. FINANCIALS

PART I. APPROPRIATION NEEDS	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	TOTAL
RADIO COMMUNICATIONS	\$8,003,514	\$117,493	\$0	\$0	\$0	\$0	\$0	\$8,121,007
COMPUTER AIDED DISPATCH	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
BACK-UP COMMUNICATIONS CENTER	\$1,169,680	\$0	\$0	\$0	\$0	\$0	\$0	\$1,169,680
TOTAL APPROPRIATIONS	\$9,173,194	\$117,493	\$0	\$0	\$0	\$0	\$0	\$9,290,687
PART II. FUNDING SOURCES	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	TOTAL
Fire Tax Reimbursement Revenues	\$896,000	\$896,000	\$896,000	\$870,600				\$3,558,600
Pay As You Go	\$8,277,194	(\$778,507)	(\$896,000)	(\$870,600)	\$0	\$0	\$0	\$5,732,087
TOTAL	\$9,173,194	\$117,493	\$0	\$0	\$0	\$0	\$0	\$9,290,687
PART III. OPERATING IMPACT	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	TOTAL
Total Operating Impact	\$482,900	\$420,000	\$0	\$0	\$0	\$0	\$0	\$902,900