

Central Florida 800 MHz Rebanding Project

Overview

Country: United States

Industry: Metropolitan area in the central region of the U.S. state of Florida

Customer Profile

According to the 2010 U.S. Census, the population of the Central Florida metropolitan area was 2,134,411 spread over 4,012 square miles. By population, it is the third-largest metropolitan area in Florida, the fifth largest in the southeastern U.S., and the 26th largest in the country.

Business Situation

Prior to the FCC mandate that ordered rebanding to separate public safety from commercial systems, the Central Florida metro area operated 800 MHz allotments that experienced interference and hindered critical communications. This system interference placed both the public's safety, as well as the safety of emergency responders, at risk on a daily basis.

Solution

CommDEX was chosen to support the Central Florida rebanding efforts to reconfigure all 800 MHz systems affected by FCC regulation. CommDEX served as the field project and technical engineering lead for the rebanding implementation, and delivered a solution that enhanced interoperable communications, mitigated interference issues, and satisfied FCC band plan for public safety. CommDEX also developed the communications plan, coordinated all project resources, conducted coverage testing, managed infrastructure equipment and subscriber equipment rebanding, created cutover/transition plans, and facilitated acceptance test plan completion and documentation.

Benefits

- Rebanding of the 800 MHz band ensured that essential public safety personnel had effective communications services available to them, especially in emergencies.
- Successful system transition completed ahead of rigorous project schedule with limited disruption to current public safety missions.

THE SITUATION

The Central Florida metropolitan area, which includes Orange, Osceola and Seminole counties, along with the cities of Orlando, Maitland, Winter Park and the District of Reedy Creek (Disney World), use 800 MHz radio systems that consist of 559 trunked repeaters at 40 sites and more than 25,550 subscriber units. These systems were impacted by the FCC's implementation of a complex multi-year transition plan to mitigate interference in the 800 MHz band by separating cellular systems and public safety systems into different portions of the band.

The aforementioned Central Florida Licensees maintain interoperable communications with six adjacent counties, a multitude of cities and districts within the Central Florida region, and the State of Florida Radio System, which were impacted as well. The successful transition of complex systems of this magnitude required skillful design and implementation, with no margin for error.

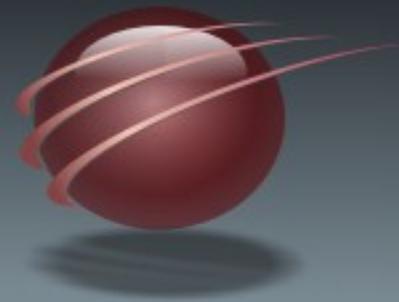
THE SOLUTION

CommDEX collaborated with Communications System Managers and Communications Directors of local jurisdictions, as well as the Motorola Project Team and Supervisory Staff, to implement a state-of-the-art solution that satisfied their frequency rebanding, interoperability and systems migration needs.



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Needs Analysis/Data Collection

During the course of the planning phase, CommDEX streamlined the process of collecting data and information by working directly with the system managers and holding more frequent in-person meetings with end users. CommDEX ensured that system users and customers were part of every decision-making group and were involved with planning and implementation initiatives. This guaranteed that all communications concerns, including interoperability issues, were taken into account during the planning process.

Interoperable Communications Planning

CommDEX assessed standing SOPs and plans established for rebanding and made suggestions for improvement. This required thorough determination of all agencies operating on the existing system to ensure that no organizations or user groups would be missed during reconfiguration. CommDEX documented the procedures to provide notification of the reconfiguration process to all subscribers, and if the system spanned multiple agencies, entities, and/or geographic areas, to all related entities.

In many cases the customer records were not adequately maintained or up-to-date with current inventories. CommDEX developed an equipment look-up tool to decode the model type and configuration of each radio. This proved invaluable in determining the correct action needed for each radio during the migration process.

Tactical Communications Planning

In order to understand what needed to be done to the public safety customer's system, CommDEX completed and documented an inventory of the existing system equipment and documented its components. Field verification of the existing system involved the following:

- Infrastructure equipment inventory with Manufacturer and model #s
- Inventory of existing subscribers

- Inventory of existing frequencies
- Identify control vs. voice channels
- Identify Failsoft channel assignments
- Verify that licenses match the frequencies in use
- Reading existing subscriber templates to understand current operations

Engineering Studies

Based on the information gathered during the data collection phase, CommDEX evaluated whether the Customer's impacted system components, in their current state, were at the correct hardware and software versions to accept the new frequencies. This assessment was particularly important for NPSPAC systems that contain trunking, DataTAC, and/or fixed data applications. This assessment included the following:

- A review of system hardware and software to determine if current versions of impacted items are compatible with new software and frequencies
- Determine suitability of the proposed frequencies to operate on the existing transmit combiners and receiver multicouplers
- Determine which existing pieces of equipment and end user devices must be retuned, reprogrammed, or replaced during reconfiguration

Intermodulation Studies

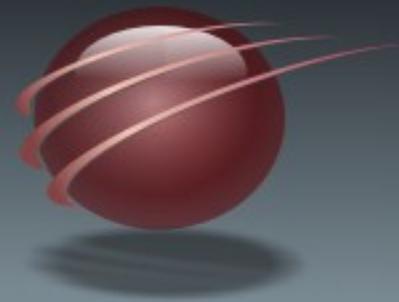
Based on the frequency data collected for the system, CommDEX conducted intermodulation studies to determine potential problems, including a co-channel analysis showing the comparability of the new frequencies to the old frequencies. The IM study helped identify the steps that needed to be taken to reconfigure the system to minimize the interference from others on the 800 MHz band.

CommDEX was also responsible for the creation and development of the Functional Acceptance Test Plans, as well as the system implementation Cutover and Fallback Plans. The team also



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participated in the fleetmapping and configuration development for over 25,000 radio subscriber units.

Identifying Technology Solutions for Interoperability

One of the challenges posed to the CommDEX Rebanding Team in Central Florida was the interoperability concerns between various jurisdictions utilizing different radio system platforms. For instance, the counties of Orange and Brevard are adjacent to one another, but one county has Motorola infrastructure while the other utilizes MA/COM. The CommDEX Team worked closely with Motorola and MA/COM to develop a solution for interoperability during the cutover of each system, thus minimizing the impact for each customer.

Coverage and Microwave Path Studies

The CommDEX Engineering Team was responsible for the pre and post system coverage testing as part of the Central Florida rebanding effort. This testing included both drive testing analysis and RF signal strength testing. The drive test involved a coverage performance baseline analysis in which the engineering team drove a specific, agreed upon route through the RF coverage area, utilizing Motorola Voyager test equipment that plotted the signal strength at various locations per GPS coordinates. After system reconfigurations, a similar test called the coverage baseline verification analysis was performed by the engineering team to note if any significant differences in RF coverage occurred since the reconfiguration work.

System Migration

Working with various jurisdictions, CommDEX developed an implementation plan that addressed the customer's unique requirements. The implementation plan detailed how the conversion would take place.

- **Migration planning** – The plan detailed how the existing subscribers on the system would be migrated to the new frequencies, as well as how a fleet of swing radios would be distributed to users while their radios were being reprogrammed. The migration plan also outlined the Rebanding Software and Hardware that may be required, along with any requirements for spare radios.
- **Cutover and Transition Plans:** CommDEX prepared a well thought-out process for transition to new frequencies while minimizing customer downtime. The cutover plan was developed in conjunction with the customer so that they fully understood the procedures and risks involved.
- **Fallback plans:** CommDEX prepared fallback plans for dealing with unanticipated situations.

The CommDEX Engineering Team analyzed the P25 noncompliant systems involved in the Central Florida rebanding effort and provided customers with strategies for system migration to become P25 compliant. Both the system infrastructure and subscriber radio units were considered and analyzed as part of this effort.

Summary

As a result of a thorough project management approach, sound engineering, and successful execution, Central Florida public safety personnel are now fully supported by communications systems that have the design and capacity to keep people safe and ensure better outcomes in emergency situations. CommDEX, working closely with Communications System Managers and Communications Directors of local jurisdictions, as well as the Motorola Project Team and Supervisory Staff, implemented a solution that satisfied the communications requirements of both the FCC and Central Florida, delivered on-time and with limited interruptions to on-going public safety operations.

