



# **PUBLIC SAFETY RADIO SYSTEM P25 UPGRADE REPORT–FY22**

## **Abstract**

A summarized report of the current status of the Brevard County 800 MHz Public Safety Radio System and the need to upgrade to P25 as an imminent solution to address cybersecurity threats and new standards.

800MHz Public Safety Radio System

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# 800MHz Radio System Project 25 (P25) Upgrade

## Background

The Brevard County 800MHz Public Safety Radio System is an intergovernmental radio communication program approved under the provision of Chapter 316.655(6), F.S, and Division of Communications policy. It provides county-wide public safety radio communication to over 6,000 users from 60 local, State, and Federal agencies/departments. The system includes eleven 9-1-1 Public Safety Answering Points (PSAPs) and nine towers in a simulcast Enhanced Digital Access Communication System (EDACS) configuration, tied to a Project 25 (P25) core backbone.

In 2012, the Board of County Commissioners authorized the first upgrade of the radio system towards Project 25 (P25). Since then, the system has evolved from a four-site multisite to a nine-site simulcast system and transitioned the PSAP's radio consoles to the newly implemented P25 backbone core.

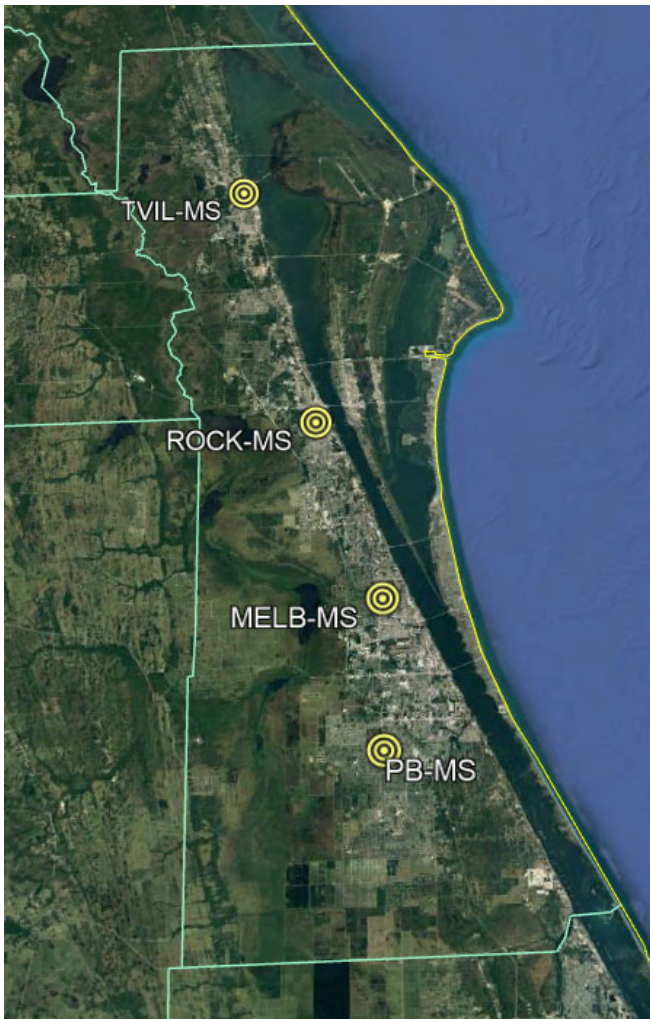


Figure 1: BC Public Safety Radio System before 2013

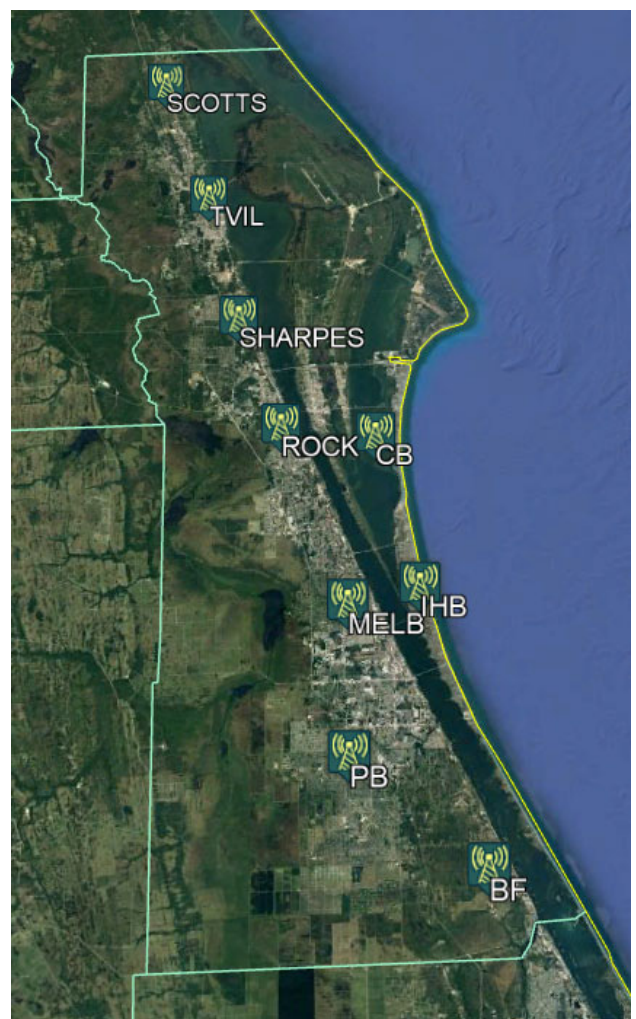


Figure 2: BC Public Safety Radio System after the upgrade

In 2019, the Board authorized the migration of the radio frequency sites to the already implemented P25 core, the last necessary step to provide a fully P25 system to the Brevard County public safety agencies and first-responders. A \$3.6M project was awarded the same year as a multi-year project, contingent upon the availability of funds, following the timeline below:

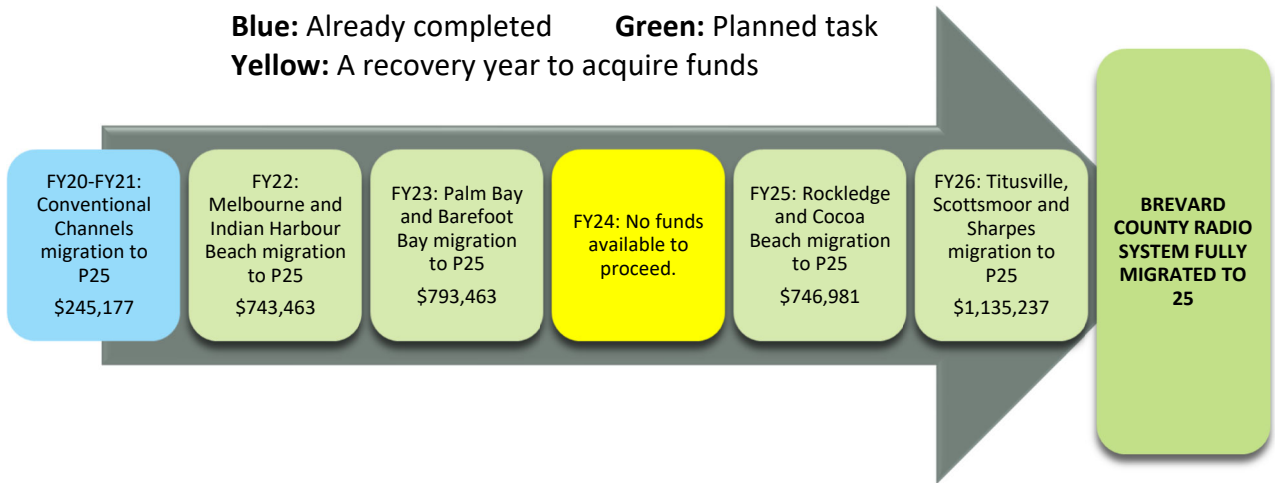


Figure 3: P25 Phase 2 Upgrade – 2019

The first task (in blue) was complete during the Fiscal Year 2020-2021, and the next task is part of the current Fiscal Year (FY) budget. During FY24, the project will need to pause; for the 800 MHz Division to collect funds and resume the upgrades in FY25.

## P25 and its benefits

P25 is a suite of standards; developed to provide digital, interoperable, and encrypted communication to public safety. The benefits of the P25 technology to the Brevard County public safety and first responders’ agencies are:

### 1. Harden cybersecurity defenses.

Living in a world where cybercrime is one of our primary threats, P25 offers the most robust set of voice/data encryption, key management, and user/system authentication and access control available today. Encrypted information over the air will allow the first-responders, agencies, and municipalities to keep critical information, like running investigations, surveillances, and active shooter incidents, out of reach from criminals. Additionally, transmitting patient information and medical records over an encrypted radio channel will decrease the response time and simplify the operation of our first responders during critical moments.

### 2. Seamless interoperability with regional public safety agencies.

The COVID-19 response demonstrated the need for interoperability between a variety of organizations and systems. In P25, radio users can easily roam to other radio systems within the region while maintaining contact with their home dispatchers via encrypted communications. Seamless radio interoperability will benefit our first responders greatly during the transport of patients to/from Brevard County.

### **3. Multi-vendor sources for radio terminal.**

As the user agencies invest in renewing their radio terminals, they currently have to pay a premium for radios with EDACS (analog) capabilities from a single source: L3Harris. By moving to the P25, the agencies will select their terminals from other vendors offering competitive pricing, as the radio terminal will no longer need analog capabilities.

### **4. Data services such as over-the-air-programming (OTAP) and tier 2 location information.**

The current cost to update/reprogram the radio terminals is \$34/hour. Over-the-air-programming (OTAP) will allow the radio terminals to receive the radio profiles, configurations, and software updates from afar, a significant cost saving when more than 6,000 radios are involved.

The real-time location of assets and personnel is a great addition that comes with P25. It contributes to the safety of the first responders and improves response times and organizational efficiencies. This service integrates with existing AVL, mapping applications, or CAD systems.

### **5. Effective double channel capacity.**

The radio frequency spectrum is a limited resource; by implementing P25 Phase-2, the County will maximize its current FCC licensed frequencies. P25 Phase 2 double the number of simultaneous conversations per frequency, equivalent to less maintenance cost and space/power needs.

### **6. Extension of coverage outside the county-wide radio coverage.**

The already integrated L3Harris BeOn service to our P25 core provides secure radio PTT (Push-To-Talk) far beyond the boundaries of our radio system by utilizing commercial wireless networks and Wi-Fi. Additionally, non-critical personnel can use the 800MHz radio system without additional investment, as these applications run on tablets, laptops, and phones.

## **Current status, challenges, and cyber vulnerabilities**

As our world becomes increasingly dependent upon computer systems and networking to accomplish day-to-day tasks, public safety radio systems are also becoming more dependent on networking equipment and connectivity to the internet. Digital technologies, like P25, give first responders many more tools than dated technologies. These advantages come with the understanding that a threat from cyberattacks exists and that we should protect the integrity of the network by applying the latest industry best practices.

Legacy equipment is one of the most common causes of cybersecurity vulnerabilities for public safety systems as manufacturers stop providing the software patches and updates necessary to maintain the integrity of the radio system. Those public safety radio systems utilizing dated and unsupported networking equipment are the most vulnerable to hackers. In August 2021, the manufacturer of the system (L3Harris) disclosed its new roadmap for the P25 systems upgrades, not only driven by the

current needs and technologies in the industry but by the end of support of some of the main system components from other manufacturers like Cisco and Microsoft.

The current core of the public safety radio system utilizes Windows Servers 2008. By January 2023, Microsoft will stop supporting the Windows Server 2008, about the same time as L3Harris will stop supporting the EDACS technology. The end of the Windows Servers 2008 support by 2023 adds a new step to the previous P25-Phase 2 Upgrade project: The existing P25 core upgrade to the next platform compatible with our Land Mobile Radio (LMR) System. Although this is an unavoidable upgrade to keep our public safety infrastructure secure, it moves our ability to fully migrate the radio frequency sites infrastructure to the P25 trunked technology from 2026 to 2028 because of funding.

The following diagram shows the new timeline, with the insertion of the P25 core upgrade in red and the need for an additional year to acquire funds if we continue the multi-year approach approved by the Board in 2019.

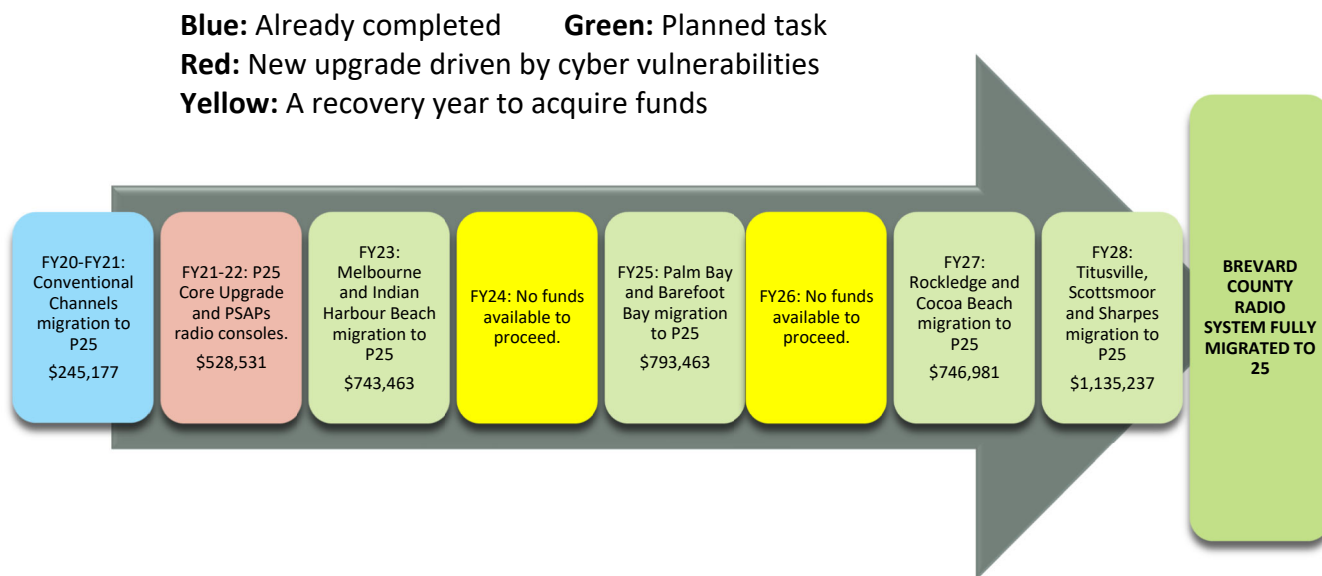


Figure 4: P25 Phase 2 Upgrade - 2021

With technology moving forward at such a high pace, utilizing a multi-year approach for future planning brings a new challenge. The upgrade of the existing network core without upgrading the site equipment leaves the radio frequency infrastructure no longer supported by the manufacturers (L3Harris and Cisco) and our public safety agencies at risk of continuing investing resources in hardware-intensive and vendor-locked solutions.

## Conclusion

The time for upgrading the network core and the radio frequency sites to P25 has come to a critical juncture. Migrating in steps to newer technology, which, in the past helped with costs, is no longer a viable approach due to the leaps taking place in technology. A total of \$3.9M investment, see attachment A, in the public safety radio infrastructure will bring the system up to the latest standards, eliminate any unforeseen future costs because of system incompatibilities, and most importantly, protect it against cybercrime.

Having up-to-date equipment in place has never been more imperative. Seculore Solutions website, a company specializing in cyber security, shows that in the past 24 months, 118 public safety agencies have been hacked, along with 276 government agencies.

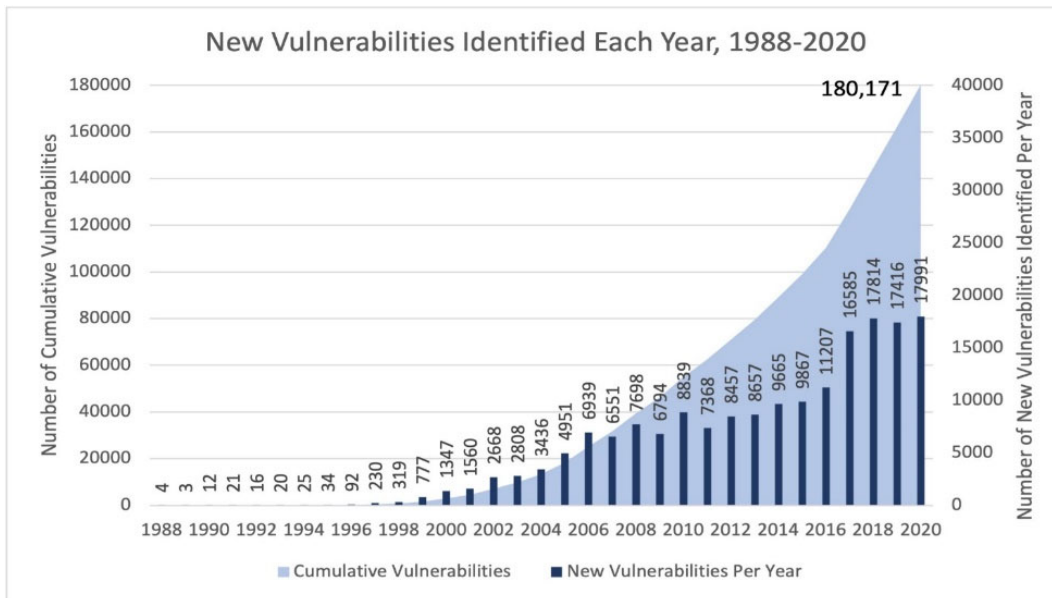


Figure 5: Newly Identified and Cumulative Vulnerabilities Per Year, 1988-2020 (Source: IBM X-Force Red)

The Florida Department of Transportation (FDOT) classifies its District 5 (Brevard, Flagler, Lake, Marion, Orange, Osceola, Seminole, Sumter, and Volusia) as one of the fastest-growing areas of the state. Ensuring that our first responders have reliable and secure communications when seconds count is one of the core missions of Public Safety. Relying on an aging legacy system with increasing vulnerabilities to cyber-attacks does not put us on a long-term path to success. The upgrade of the current system, driven by the new standards, the obsolescence of the equipment, and the cybersecurity vulnerabilities, is imperative.

# ATTACHMENT A

TASK ORDER	DESCRIPTION	PRICE
1	Conventional channels migration to P25	Completed FY21-12.50
2	P25 Core upgrade	\$528,531 (in progress)-12.50
3	South Cell - Melbourne and Indian Harbour Beach migration to P25	\$743,463
4	South Cell – Palm Bay and Barefoot Bay migration to P25	\$793,463
5	North Cell – Rockledge and Cocoa Beach migration to P25	\$746,981
6	North Cell – Titusville, Scottsmoor and Sharpes migration to P25	\$1,135,237
	<b>TOTAL</b>	<b>\$3,419,144</b>

Figure 6: Brevard County P25 Upgrade - Phase 2