Massachusetts Bay Transportation Authority

MBTA Construction Contract No. C90CN01: Critical Communications Implementation & P25 Plan for Transit Police, Rail, & Bus (CCTRB)

MBTA Board of Directors

September 22, 2022

Vince Cameron, Project Manager, Capital Delivery

Background

Our Radio System

- The MBTA's radio system supports communication for both transportation and public safety.
  - Internal: MBTA Operations, Transit Police, Bus data
  - Interagency: BPD, BFD, EMS, CFD, MSP, BAPERN, Mutual Aid, & other interoperability channels
- 5000+ radios are currently in use by MBTA Operations and TPD.
- 5 simulcast tower sites provide above-ground radio coverage out to I-95.
- Bi-Directional Antenna (BDA) & Distributed Antenna System (DAS) provide below-ground radio coverage in 31 underground stations and in over 24 miles of tunnel.

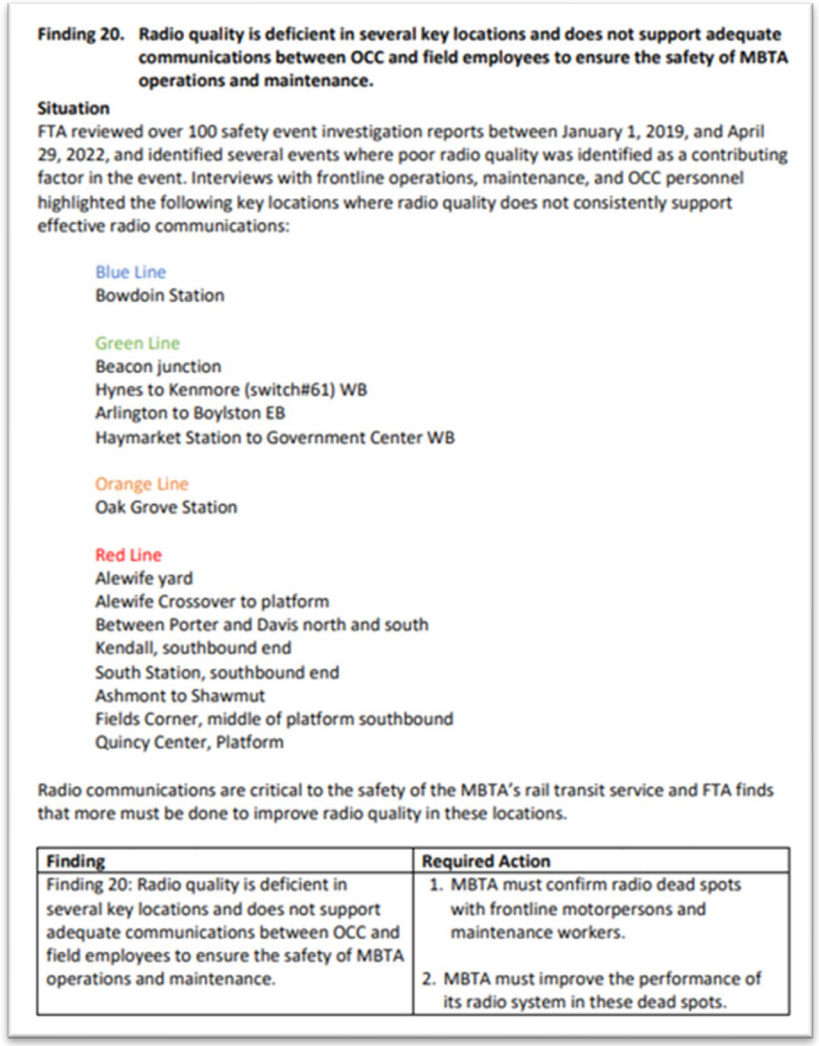
Current Limitations

- MBTA currently uses an EDACS System for Radio communications which has reached end-of-life and is no longer supported by the manufacturer.
- There are design flaws in the current radio system infrastructure that have impacted the resiliency, performance, and coverage availability.

Project Overview

- Design and build a new, robust, and state-of- the-art P25 Radio System to replace the existing EDACS Radio System.
  - Upgrade and replace head-end radio equipment at 45 High Street (OCC) and Cabot (BOCC)
  - Upgrade and replace dispatch consoles at OCC, BOCC, and TPD
  - Upgrade and replace all non-P25 capable mobile, portable, and desktop radios. (Reprogram others)
  - Upgrade and replace backup power systems
- Supplement and expand the existing above ground radio coverage out to I-495 areas north, south, and west.
  - Upgrade and replace radio equipment at the 5 existing simulcast tower sites
  - Add 4 new simulcast radio tower sites
- Improve capacity, range, and efficiency of the tunnel radio communications system.
  - Upgrade and replace and supplement Fiber-Fed BDA Systems install additional in-building repeaters
  - 30+ miles of new radiating antenna cable in tunnels
- The goal is for P25 radio system to serve the MBTA's communication needs for the next 20+ years.

Safety & Reliability Impact



Finding 20. Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.

Situation

FTA reviewed over 100 safety event investigation reports between January 1, 2019, and April 29, 2022, and identified several events where poor radio quality was identified as a contributing factor in the event. Interviews with frontline operations, maintenance, and OCC personnel highlighted the following key locations where radio quality does not consistently support effective radio communications:

Blue Line
Bowdoin Station

Green Line
Beacon junction
Hynes to Kenmore (switch#61) WB
Arlington to Boylston EB
Haymarket Station to Government Center WB

Orange Line
Oak Grove Station

Red Line
Alewife yard
Alewife Crossover to platform
Between Porter and Davis north and south
Kendall, southbound end
South Station, southbound end
Ashmont to Shawmut
Fields Corner, middle of platform southbound
Quincy Center, Platform

Radio communications are critical to the safety of the MBTA's rail transit service and FTA finds that more must be done to improve radio quality in these locations.

Finding	Required Action
Finding 20: Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.	1. MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers. 2. MBTA must improve the performance of its radio system in these dead spots.

Excerpt from: FTA Safety Management Inspection – Final Report

- Reliable Radio Communication is **Critical** to MBTA Safety.
- Improve and expand radio coverage above and below ground.
  - Demonstrate 95% Coverage Reliability
- Backup OCC Dispatch Center to be built at Cabot Yard.
- Install new 4-hour emergency battery backup systems at each base station site for uninterrupted communication.

Design Build Procurement Schedule

- Issued RFLOI: December 15, 2021
- Issued RFQ: January 10, 2022
  - 3 Statements of Qualifications were received
  - 2 firms shortlisted and invited to submit proposals
- Issued RFP: March 10, 2022
- Public Price Opening: July 13, 2022
  - L3 Harris Technologies, Inc. proposal selected as best value
- Contract Award (anticipated): October 2022
- Construction begins (anticipated): May 2023
- Substantial Completion (anticipated): September 2027
  - *Project Team to explore options for accelerating equipment/infrastructure installation*

Board Vote

Today's Board action will provide approval to award MBTA Contract No. C90CN01 for the Design and Procurement of a new P25 Radio System which will modernize, and expand critical communications for MBTA Transit Police, Rail, & Bus.

VOTED:

To authorize the General Manager, or his designee, to award and execute MBTA Contract No. C90CN01: Critical Communications Implementation & P25 Plan for Transit Police, Rail, & Bus (CCTRB) with L3Harris Technologies, Inc., in the amount of $98,314,011.25, in a form approved by the General Counsel, and to execute any necessary or ancillary documents in the name and on behalf of the Massachusetts Bay Transportation Authority to effectuate this Agreement.

Appendix

Additional Details

Abbreviations and Useful Information

APCO – Association of Public-Safety Communications Officials-International

Internationally recognized organization of public safety communications professional

MBTA Systemwide Radio Design Build Project contract title

EDACS – Enhanced Digital Access Communication System

Radio communications protocol currently in use at MBTA which has reached end-of-life and is no longer supported by the manufacturer.

P25 – APCO Project 25

Next generation of digital radio standards indented to:

(1) Obtain maximum radio spectrum efficiency

(2) Ensure competition in system life cycle procurements

(3) Allow effective, efficient, and reliable intra-agency and inter-agency communications

(4) Provide "user friendly" equipment