



Emergency Radio Communications in Subway Tunnels Using Fixed Mount DVRS



Customer Profile

Users

Public Safety Personnel, Transit Operations including security and Maintenance. Road Maintenance Crews.

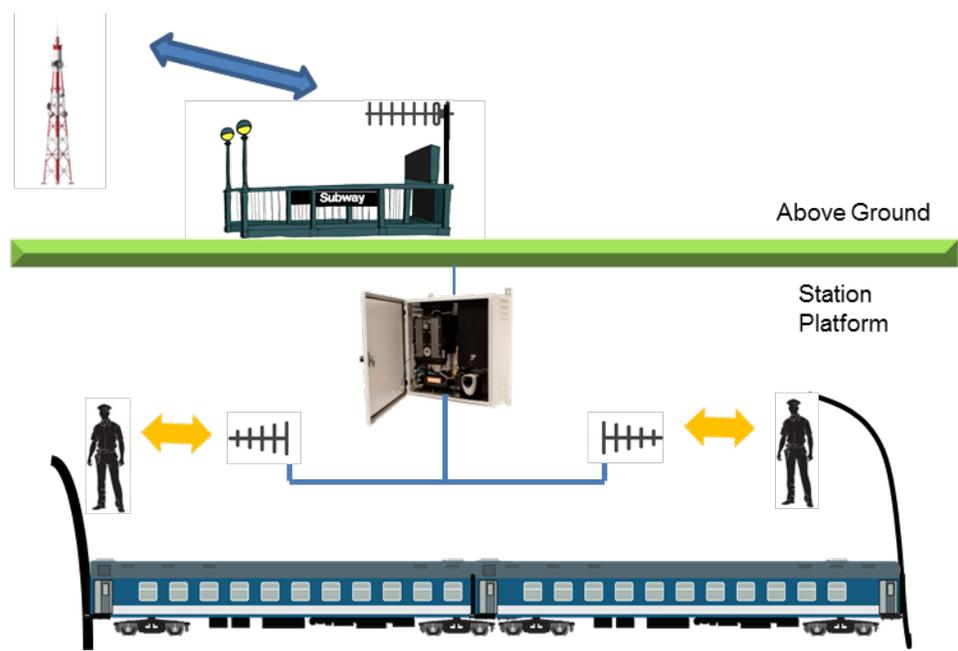
Applications

Public safety radio coverage throughout subway systems, road tunnels, water works tunnels.

The use of Distributed Antenna Systems (DAS) to provide radio communications for both transit staff and first responders is the most common way to extend radio coverage into tunnels. As an alternative to these complex, expensive and difficult to install solutions several users have turned to the Futurecom Fixed Mount DVRS (FDVR) solution as a means to extend radio coverage.

Vehicle repeaters are widely used in the fire and police service to extend in-building radio coverage. Subways provide a unique challenge due to the single point for the radio signals to enter/exit and the sharp 90 and 180 degree turns on the stairways. The result is that network communications usually stop a few feet down the stairs, and best case (a modern station with wide stairways), a mobile repeater in the vehicle will extend communications to the platform. Communications stop once the user goes a few steps into the tunnels.

A relatively inexpensive solution involves the use of a FDVR, which repeats locally (extending coverage between users) and also relays the communications back to the network. With modern P25 networks most network features can also be extended.



General Overview Diagram

A large police agency recently proved the viability of this operation in a real world environment. The police department is responsible for security underground and coverage of their P25 UHF trunked system could not reach the officers on the subway platforms. The customer decided to use a UHF In-Band FDVR to extend coverage of network. Directional antennas were installed at both ends of the platforms to direct signal down the tunnels and provide platform coverage.

A key advantage of this solution is that there is no equipment in the tunnels, so installation is much simpler. Much of all of it can be done while the subway is still operating. Likewise maintenance can be done without the need for tunnel access. Lastly, the odds of a catastrophic failure of communications due to fire or derailment is greatly reduced.

Testing in several systems has shown that the signal from one FDVR typically extends on to two stations in either direction. If an FDVR is located at each station, you will have redundant radio coverage as shown in the diagram below.

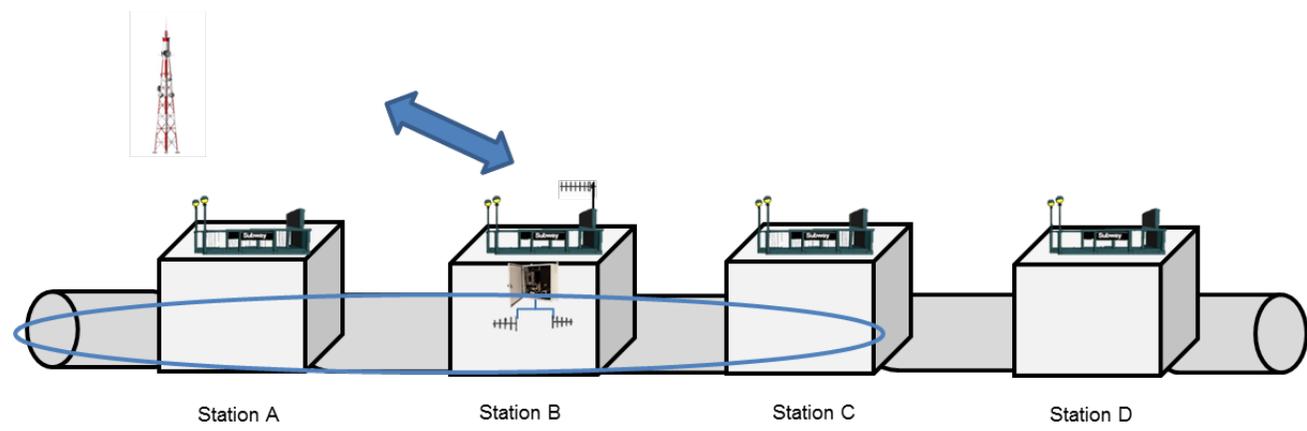


Diagram 1: Tunnel coverage from one DVRS on located at station B – Using 1 Frequency

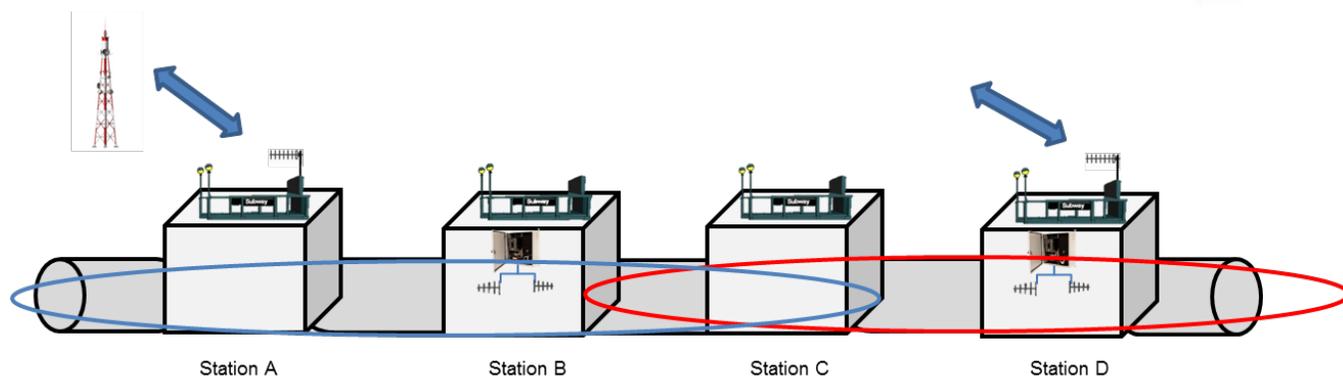


Diagram 2: Tunnel coverage from two FDVRs located at station B & D – Using 2 Frequencies

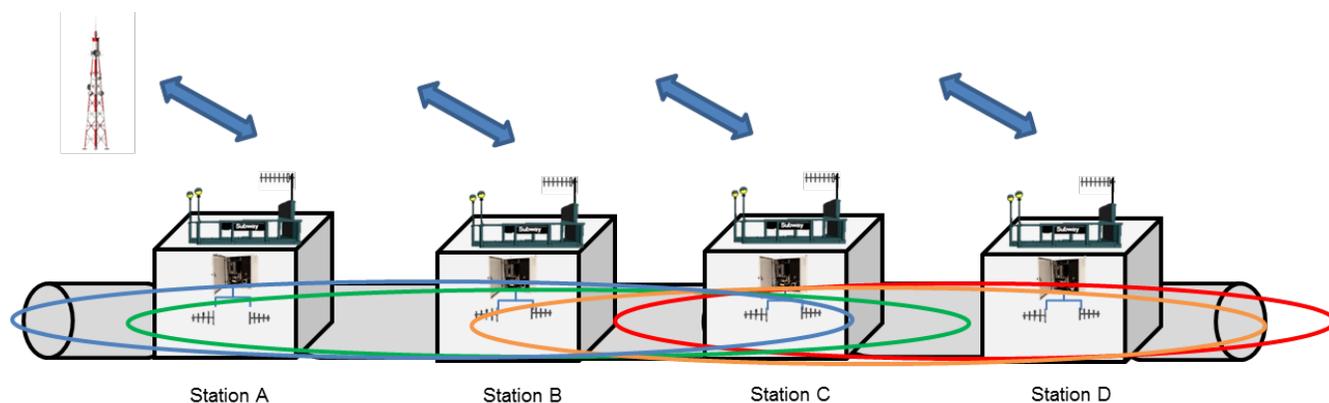


Diagram 3: Tunnel coverage from four FDVRs located at each station Using 4 Frequencies

The only requirement to connect to the FDVR to achieve extended radio coverage is to change to the necessary FDVR channel. Users that forgot will quickly be reminded by the OOR tone (Out of Range) on their portable radio.

Public safety agencies and transit operators looking for an alternate communication solution underground can look at the FDVR solution as a vital asset in their radio communications arsenal.

The DVRS is also available in a transportable format to maximize flexibility.

To learn more about the Futurecom P25 DVRS product line please visit www.futurecom.com

