

# LEO - PARIS, FRANCE

## MESH CAPABILITIES IN TUNNELS



## OBJECTIVE

Preparing for the Rugby World Cup next year, and the Olympics the following year, law enforcement agencies need to be sure they can communicate effectively in any environment that could present a threat.

The standard DMR radios lose connectivity within about 10 metres of heading down the extremely narrow, tight concrete spiral stairs to the catacombs, 20 metres below the street and, of course there is no network connectivity either.

## EQUIPMENT USED

Three PTT IP Mesh radios were 500mW RF power, with 0dBi gain, operating in L Band (1475MHz) at 5MHz bandwidth with ~5mbps throughput.

**IN THE DEEPEST CATACOMBS UNDER PARIS,  
OUR PTT MESH RADIOS HAVE EXCELLED IN  
BRINGING COMMS BACK TO THE SURFACE**

## FROM SURFACE, TO UP TO 200 METERS IN TO THE TUNNELS

The tunnel was barely 2 metres in height and about the same in width. Wearing the Wearin' sensor vest (which needs network connectivity at all times) and with one PTT Mesh radio on the surface connected via the integral Wi Fi access point, to the Wearin tablet dashboard, using 2.5MHz bandwidth, we achieved and exceeded the objective of 100 metres penetration along the underground tunnel, while operating the Wearin' sensor system. We used one radio as a relay at the top of the spiral stairs and then deployed a further two radios as relays in the tunnel, which curved considerably along the route. All radios used only 500mW RF output power.

We then switched waveforms on the radios and engaged the ultra-narrow-band 300KHz bandwidth. Developed for PTT voice and low data rates at extreme range and penetration, we needed only 3 radios, including the radio at the surface, to achieve 200 metres connectivity along the tunnel, much to the satisfaction of the end user.



## CONCLUSION

*The trial exceeded the customers expectations.*

The demo in the tunnel tests met our expectations, and exceeded our customers, requiring less radios to achieve the results than what they had expected.

We look forward to continued success with our partners and stake holders on this project to get them the best network connectivity solution using our world class PTT Mesh radios even in the most demanding of environments.



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