



# Solutions

## TUNNELS

Millions of commuters pass through tunnels each day, be that by rail, subway, or highway tunnels. Transit operations and maintenance staff, as well as multiple public safety agencies' personnel rely on seamless radio coverage to maintain operations and to ensure a safe environment. Tunnels can provide challenges to traditional DAS deployments, including long distances (optical link budget), old lossy radiating cables, the number of remote units required and multiband operation.

### ENABLING EMERGENCY COMMUNICATIONS INDOORS

These mission-critical applications also demand high system availability, which Avari® supports with end-to-end redundant configurations with fiber diversity and automatic switchover.

Long tunnel lengths also provide situations where remote units can be separated by great distances, including several miles. Avari's public safety DAS, the VL™ Series, offers the longest available optical link budget by using digital transport, as well as Automatic Optical Delay Compensation, where the signal arrival time is measured to each remote unit and automatically balanced to synchronize antenna system network (important to mitigate time-delay interference (TDI) problems in narrowband systems as well as in LTE MIMO applications). Limited fiber availability is another common problem in subway systems especially when redundant headend locations are at opposite ends of the rail line. Avari's flexible star and daisy-chain fiber connectivity along the ring topology is the perfect solution to the problem.

Avari's high-reliability public safety DAS solution provides a powerful network infrastructure that can accommodate all public safety bands, including VHF, UHF, 700MHz, 800MHz, 900MHz, and LMR wherever the signal sources are located. Our high-power multiband integrated solution provides seamless and redundant coverage for tunnel environments and is scalable to add emerging technologies like FirstNet and private LTE. High availability is supported by using redundant headend radio sources and intelligent algorithms to adapt, re-route channel traffic or re-configure signal path based on fault conditions to achieve self-healing without manual intervention.

The Avari® VL™ Element Manager (VL-EM™) provides centralized system management over the entire distributed antenna network. In addition to fault, performance and configuration management capabilities, the VL-EM™ supports industry-standard Simple Network Management Protocol (SNMP) for easy integration with any third-party network management platform.

As per NFPA fire code standard, all of Avari's digital DAS network elements support dry contact alarm connections for both radio communication systems and battery backup units. Avari® offers the most versatile fire alarm connection solution in the industry whether it is centralized or distributed alarm panels.

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