

CASE STUDY Rail Infrastructure



Market Segment: Transportation Rail Wayside

Country of Installation: London, UK

Year of Installation: **2020 – 2023**

End customer: Transport for London

Solutions: Public Address and Voice Alarm (PAVA)

Key Products: V2000, SAP03, ANS04-ES, EOLZ01

Key Technology: VIPEDIA

Client: **Telent**

Zenitel strengthens London Underground's Jubilee Line system

The upgrade delivered outstanding sound quality across the transportation network via a new Public Address and Voice Alarm system.

The Customer/End User

Transport for London (TfL), formerly known as London Underground, is a globally recognized transportation network responsible for connecting over 3 million commuters across the UK capital. The majority of its stations already rely on Zenitel equipment for their Public Address and Voice Alarm (PAVA) systems. However, the Jubilee Line Extension (JLE) – which had been in service for 24 years – still utilised legacy PAVA equipment manufactured by Millbank Electronics and software developed by ASL.

TfL trusted Telent, a specialist in the effective operation of critical national infrastructure, to design, integrate, and install the new PAVA systems across the 9 JLE stations.

The Requirement

Telent were contracted to deliver pre-built, configured, and FAT tested EN 54 PAVA systems for each station, supporting functionalities such as emergency broadcasts, live paging from platforms, and seamless integration with Telent's MICA SMS control system. The new system was required to have a minimum operational life of 10-15 years, reduced power consumption and with provision for future phased upgrades.

While upgrading the PAVA systems, Telent were required to retain certain aspects of the existing infrastructure, including loudspeakers, cabling for the ambient noise sensors and microphones and platform microphone housings, in order to minimise capital expenditure. This necessitated customization and value engineering to integrate old and new components seamlessly.



Additionally, to ensure uninterrupted service during the upgrade, Telent required support for over-and-back testing. To ensure a smooth transition from the old to new system, both systems needed to be installed side-by-side in the existing communications rooms, necessitating the need for a very compact solution.

After assessing various manufacturers based on their technical capabilities, experience in the rail industry, and supporting services, Telent selected Zenitel for the project. Zenitel's expertise, flexibility and ability to meet the project requirements made them the only choice, underscoring Zenitel's ongoing commitment to supporting railway infrastructure and services across London.

The Solution

Zenitel's VIPEDIA-based PAVA technology was selected to fulfil the rigorous demands of the project. At each station, the PAVA system typically comprises two locally bayed cabinets housing multiple VIPEDIA-12-NET audio routers and V2000 amplifier mainframes. These components serve various functions such as control, surveillance, and amplification.

Overcoming space constraints presented a significant challenge,

and the V2000 systems emerged as the optimal solution. Compact yet robust, the V2000 amplifier mainframe supports up to 10 amplifier modules and a maximum load of 2000W within a single 2U 19" chassis, effectively minimising the system's footprint. Integration of the EN 54-4 battery charger within the V2000 further optimises cabinet space utilisation.

To reduce the need for new cabling, IP-enabled SAP03 (Station Announcement Points) were deployed over existing coax cable. Additionally, hundreds of analogue Ambient Noise Sensors (ANS04-ES) were connected back to the system using industrial IP converters at each end.

To ensure the integrity of the existing loudspeaker lines, impedance monitoring end-of-line devices (EOLZ01) were installed. Despite the constraints imposed by the existing loudspeaker installations, improvements in Speech Transmission Index (STI) were achieved through use of the highly configurable parametric EQ Controls provided by the VIPEDIA, setting a new benchmark for performance.

Furthermore, Zenitel and Telent collaborated to design and manufacture a custom front panel to mount the Zenitel SAP03 electronics into the existing Millbank Electronics enclosure. This co-development proved to be highly successful and was key to assisting in a straightforward over-and-back program.

Finally, the system required the Zenitel IP-enabled API (VIPA-API) for integration with Telent's MICA SMS control system, providing control, automation, scheduling and pre-recorded spot announcements with full system transmitted system-wide via IP.

The Result

Telent's collaboration with Zenitel facilitated the successful upgrade of PAVA systems for TfL, underscoring their commitment to improving railway infrastructure and services.

The new systems effectively address all the requirements, delivering outstanding sound quality. Moreover, the Zenitel PAVA reduced the average power consumption of the systems by 50%, a significant improvement that hugely lowers the whole system life cost.

By delivering state-of-the-art technology and tailored PAVA solutions, Telent and Zenitel continue to play a pivotal role in transforming the rail industry landscape.



"We are proud of our enduring partnership with Telent and Transport for London and remain dedicated to bringing numerous advantages to passengers and staff alike."

Why Zenitel?

Zenitel is well positioned to drive the future of intelligent critical communication solutions. Through our portfolio of IP products and solutions, with built-in intelligence and a focus on cybersecurity, we provide organisations with superior, scalable security and flexibility. Zenitel is the proven, preferred choice for environments requiring crystal-clear audio to ensure the protection of human life, property, assets and the management of critical activities. With interoperability at all levels, we seamlessly integrate with access control, video management and security platforms-

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