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SMART TRANSPORT HUBS:

María Zambrano Station Andalucia Pilot Study 5G

CONNECTING TRANSPORT HUBS. CONNECTED PASSENGERS

Malaga, Spain

MARÍA ZAMBRANO STATION ANDALUCIA PILOT STUDY 5G

Malaga, Spain

Client:	Adif, Ministry of Development, Vodafone, Red.es
Date:	2020-2021
Capital Cost:	Euro 7m
Sector:	Rail & Metro, Transportation
Status:	Completed

OVERVIEW

As part of a Andalucia Pilot 5G project, Ayesa worked with Adif, the railway administrator, Vodafone and Red.es to develop two proven use cases of 5G to improve passenger journeys and efficiencies in operations and maintenance for the High-Speed Maria Zambrano Station in Malaga. This technology covers the entire lifecycle from design to operations, maintenance, and redevelopment, with applications for many other sectors such as aerospace, tourism, energy, and others.

PRIMARY ROLE: A digital twin (BIM) model of the station with structures, geometrics, spatial relationships, systems and elements was first developed, which uses AI to predict maintenance and anticipate potential problems across assets. Next, the team connected the model with two mobile phone apps in Augmented Reality - a maintenance app for Adif's staff for preventative/ corrective repairs and a People guidance app which guides passengers through the station. 5G enables data to flow back and forth instantly from both apps into the BIM station model, reflecting live experiences (crowding, security, passenger distress) and real-time operations and maintenance (a repaired track) or new shops and outlets added. The programmes used were Unity technology and BIM 360 by Autodesk. All building modifications and data (businesses, numbers, timetables, etc.), are kept in the BIM model centrally and automatically reflected in the app, making notifications of incidents current and instantaneous.

The Passenger Guidance App in Augmented Reality helps passengers navigate services, ticketing desks, and platforms, with particular benefits for reduced mobility travellers. Benefits include personalised real-time navigation paths, quicker integration with other transport modes, and easier interaction with station facilities and commercial outlets; decision-makers are provided with a picture of passengers' wayfinding to support future asset development.

The Station Maintenance App makes operations and maintenance efficient, cost-effective and safe. It allows facility managers to monitor services (water, electricity, lifts, etc.) and access the building's 3D BIM model in real-time, as well as useful documents (maps, manuals, etc.). It improves staff resourcing by issuing a daily list of preventative and corrective maintenance tasks – with workflows monitoring and recorded in one central system to ensure the worker is clear about what work needs to be done and the manager knows when it is completed. The most up-to-date Digital instruction manuals can be accessed through the app, and work reporting is digitised, thus reducing the carbon footprint. Station safety is improved as the technicians have instant access to breakdowns which need attention, and their status is updated immediately once completed.

Innovation and Value Add: Station managers, designers and builders of infrastructure such as airports, port terminals and stations demand a high return on the value of their investment. By combining 5G applications with a BIM model, this technology builds value by bridging the gap between station and passenger; it provides real-time updates on building health metrics and KPIs, including air quality, facility usage, station occupancy and compliance with regulations. This allows operators to quickly address issues should the readings shift out of acceptable range and manage compliance.