

## Riyadh metro Yellow, Green and Purple lines

**Country:** Saudi Arabia

**Type:** transit - new construction

**Project owner:** Royal Commission for Riyadh City

**Lead contractor:** Fast Consortium, led by FCC Construcción

**Lead engineering/design firm:** WSP, Hill International and Louis Berger

**Other notable participants:** Samsung C&T, Freyssinet, Tyspa and Setec

**Start:** 2016

**End:** June 28 2024

**Value:** \$US 9bn



The Yellow, Green, and Purple lines of the Riyadh metro entered service in late 2024. Photo: Alstom

As a member of the Fast consortium which on a turnkey basis designed, built and commissioned the Yellow, Green and Purple lines of the Riyadh metro, also respectively known as lines 4, 5 and 6, Alstom has acted as rail systems integrator. It has managed all aspects from preliminary design through detailed design, interface management, supply, installation and integration to testing and commissioning of rail systems, including a fleet of 69 driverless trains. Alstom also supplied depot equipment and platform screen doors. Adding the three new lines to Riyadh's metro network involved the construction of 29 stations, as well as 64.5km of double track, 30km of viaduct and two new depots.

The project faced several challenges, including technical complexity, stringent deadlines, and logistical constraints. The tender specification was functional, requiring Alstom and its consortium partners to develop preliminary and detailed designs to achieve and demonstrate the required performance. The Yellow and Purple lines share a

common section, complicating timetable management, while the rolling stock maintenance depot for both lines is on a branch of the Yellow Line rather than at the terminus, further complicating procedures for bringing trains into and out of service. The Covid-19 pandemic caused disruption to equipment procurement and the availability of skilled personnel. Continued investment in local expertise, bringing specialist capability into Riyadh, significantly enhanced capacity to support the customer and deliver the project effectively, backed up by hundreds of Alstom employees around the world.

### On time

Advanced solutions were instrumental in delivering the project on time and within budget, while ensuring long-term operational efficiency and sustainability. This included the deployment of the Appitrack mechanised slab track construction system, which enabled installation at four times the speed of traditional methods. This was vital to

adhering to the demanding construction schedule while maintaining stringent safety and quality standards. In addition, the Alstom Urbalis CBTC signalling system improves line capacity by 30%, reducing headways to 90 seconds and enabling high-frequency operation, while reducing the need for trackside equipment which reduces both cost and energy consumption.

Alstom is also providing maintenance services for the Yellow, Green and Purple lines, including track, rolling stock, platform screen doors, the third rail traction power supply system, substations and depot equipment, as well as signalling, telecommunications and low-voltage systems. The HealthHub system has been deployed to enable condition-based and predictive maintenance, continuously monitoring asset health to maximise reliability and availability, while optimising lifecycle costs. From the preliminary design phase, reliability growth processes were implemented, setting reliability benchmarks and identifying specific tests to detect defects early on. **IRJ**



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