

# RAPID DELIVERY PROGRAM

Digital tools credited with fast tracking delivery of Indonesia’s first high speed rail line.

**T**ravel times between the Indonesian cities of Jakarta and Bandung were expected to be slashed from three to five hours to just 36 minutes as a new high speed rail link started test operations in November.

Indonesian president Joko Widodo laid down a challenge for the project team on the 143km long Integrated High Speed Railway to complete the construction phase as the nation hosted the G20 summit the same month.

Design and build contractor PT Wijaya Karya (Wika) used digital design tools to meet that challenge with Chinese-built trains starting test operations. The contractor helped bring the completion of the country’s first high speed rail link forward by six months and reduce costs, securing a win at Bentley Systems Going Digital Awards in Infrastructure’s Rail and Transit category in London in November.

Judges for the category, who included NCE editor Claire Smith, said that the project’s broad adoption of Bentley’s design tools mid-way through the delivery had helped to overcome the technical issues on the project and manage risk, as well as improve data control and communication. “Not only have the project team worked in a new way on this scheme using the software, they have managed to deliver both time and cost savings as a result,” said Smith.

The overall project to deliver the rail link, which includes 83km of elevated track, 46 bridges, 13 tunnels and 55 cuttings, cost US\$7.8bn (£6.5bn) but use of the Bentley software saved US\$185M (£155M) and reduced waste by 5%. The savings were delivered, along with the fast tracking of the work, despite the move from 2D to 3D design practices being undertaken after work had started.

Work on the project started in 2016 but



**The new railway will cut journey times between Jakarta and Bandung to 36 minutes**

the digital approach was not started until 2020 when project costs were expected to be US\$2.6bn (£2.1bn) over budget and the work was expected to miss the mid-2023 opening date. Wika has said that costs are now expected to be US\$1.67bn (£1.39bn) under the project budget.

Wika used a BIM library and templates to accelerate the design and a suite of software to find and resolve design errors and reduce rework. Earthworks were also almost halved from 6.2M.m<sup>3</sup> to 3.3M.m<sup>3</sup> as a result of the digital design tools and 4D digital rehearsal to improve the sequencing of the work.

According to Wika, the move from conventional design methods to 3D design in early 2020 also helped the project team remain operational during the pandemic.

Currently the journey time between Jakarta and Bandung takes up to five hours by road but travel times between the two cities will take just 36 minutes when the rail line opens next year.

Lessons learned from the work are expected to be applied to the next phases of the high speed rail project that will see the route extended by another 700km from Bandung to Surabaya.