



ACCIONA Removes Dangerous Rail Level Crossings in Melbourne

SYNCHRO™ Reduces Construction Staging Time and Ensure a Safe Work Environment

A LANDMARK MAJOR RAIL INFRASTRUCTURE INITIATIVE

When a railway crosses a road at the same level—without a tunnel or overpass to separate them—it can create a dangerous situation for commuters. In 2014, to create a safer environment for their communities, the government of Victoria announced removing 50 of the most dangerous and congested level crossings in Melbourne, Australia by 2022. In 2021, that number increased to 85 level crossings to be removed.

Today, the program involves removing even more level crossings and rebuilding 51 rail stations in the city to improve safety, reduce congestion, and allow trains to run more often. ACCIONA, a key member of the South Program Alliance (SPA), are one of the four ongoing program Alliances established by Victoria's Major Transport Infrastructure Authority (MTIA) to deliver the Level Crossing Removal Program. ACCIONA, with their alliance partners, were tasked with removing level crossings and constructing new stations along the Frankston Line. One of the additional works packages (AWP2) included removal of level crossings and the upgrade of three stations, with a project cost of AUD 744 million. The project required meticulous and efficient planning, design, and project delivery—and temporarily shutting down rail lines and stations.

"As part of the construction process, we take occupation (i.e. ownership) of the rail and, as you can imagine, that means that the commuters can no longer get into the city," said Daniel Easter, digital engineering manager at ACCIONA. "It's really important that we understand exactly how we're going to deliver this, how long certain construction activities are going to take, and to ensure minimal impact on the local community. And obviously, safety is paramount as we're doing this."

ENSURING A SAFE BUT EFFICIENT PLAN

ACCIONA sought the best digital solution to support a connected ecosystem approach, ensuring that the right project information would be accessible to the right people at the right time. This approach would enable teams to make smarter, better, and more sustainable decisions. They also needed to ensure that commuters could get back to their normal travel as quickly as possible—and that the project was conducted safely within tight time constraints. Previously, the team used static PowerPoint staging plans. They would have to manually update plans whenever changes occurred, leading to delays in decision-making and wasted time. For a heavy civil project of this magnitude, the team knew that these traditional methods would not work. So, they would need software that would allow them to visualize and rehearse how construction workflows would occur in real-time. "With the fast-paced nature in which we need to deliver projects, you need to have a solution that removes risk and helps you deliver on time," said Easter. "So, why wouldn't you do a digital dress rehearsal? Why wouldn't you connect information to get those insights?"

ACCIONA also needed to ensure effective communication, coordination, and oversight between all key project members. The team had to communicate project plans with a large stakeholder group that needed to understand and validate the construction plans and sequences for removing these level crossings. The software also needed to provide visual planning for teams in the field, allowing them to stay updated on daily project progress and plans. While previously used software could provide the visualization needed for this project, it lacked support for multiple users to work in the platform at the same time. This situation led to inefficiencies and miscommunications, creating

PROJECT SUMMARY ORGANIZATION

ACCIONA

SOLUTION

Construction

LOCATION

Melbourne, Victoria, Australia

PROJECT OBJECTIVES

- ◆ To remove dangerous level crossings and construct new stations along Melbourne's Frankston Line.
- ◆ To get commuters quickly back to normal travel while providing a safe work environment.

PROJECT PLAYBOOK

Bentley LumenRT™, iTwin® Capture, MicroStation®, OpenBridge®, OpenRail™, OpenRoads™, ProjectWise®, SYNCHRO

FAST FACTS

- ◆ The government of Victoria announced removing over 100 level crossings and rebuilding 51 rail stations in Melbourne.
- ◆ Part of the Southern Program Alliance, ACCIONA would remove level crossings and construct new stations along the Frankston Line.
- ◆ They chose SYNCHRO 4D to create a 4D construction model of the entire project.
- ◆ Using SYNCHRO Control expanded 4D cloud collaboration while SYNCHRO Field allowed field teams to access project information on mobile devices.

ROI

- ◆ ACCIONA reduced staging time by 67% and drafting requests by approximately 88%.

“Our digital approach, supported by Bentley Systems, helped deliver this landmark project of removing dangerous level crossings in Melbourne, safely, on-time, and with minimal disruption to passengers and the public.”

– Daniel Easter, Digital Engineering Manager, ACCIONA



confusion and lengthy decision-making processes. Learning from these past experiences, ACCIONA required a seamless integrated solution that would provide functional and clear plans in a digitally visual environment.

USING 4D TO DELIVER HEAVY CIVIL

ACCIONA chose SYNCHRO 4D to create a 4D construction model of the entire project. The application allowed the team to conduct virtual planning ahead of construction, minimize disruptions to the community, and align the team and stakeholders around a single plan. By leveraging its simulation capabilities, the team was able to demonstrate how the construction process would flow, helping everyone see and understand the plan. “I see SYNCHRO as the staple in construction and in 4D,” said Easter. “So for us, it’s a bit of a no brainer.”

Using SYNCHRO Control, the ACCIONA team also expanded their 4D cloud collaboration. SYNCHRO Control eliminated the challenges of manual model federation, ensured easier data collection and issue tracking, and kept teams aligned around the latest project information. The construction team had access and insight into daily plans, creating a better understanding of where the project stood and what tasks needed to be completed at what time. For a project this complex, this data accessibility and understanding were paramount. The team worked closely with Bentley to provide feedback and to test SYNCHRO Control in a real-world scenario. “That collaboration has been excellent for us,” said Easter. “We are going to carry that on, and I think it’s something that Bentley as an organization does that sets themselves apart from other vendors that we’ve worked with.”

Meanwhile, SYNCHRO Field made it possible for teams in the field to access the latest project information right on a mobile device. ACCIONA could also

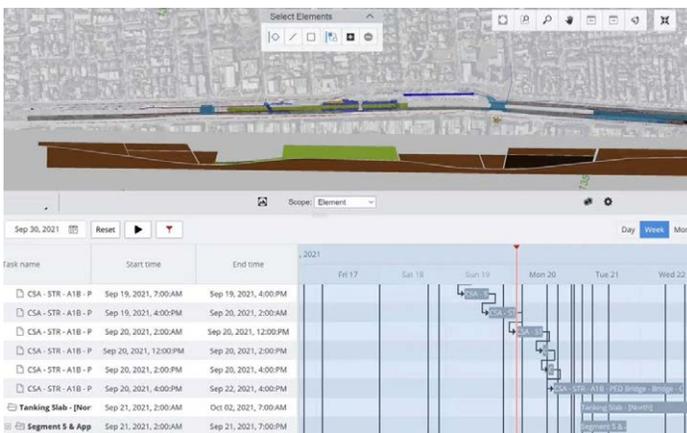
capture site conditions, flag issues, and report progress. Additionally, team members could access the 4D model on site rather than having to wait until they got back to their desktop, streamlining workflows.

With the iTwin Platform, ACCIONA developed a digital twin of the project that they could adjust in real-time, allowing the team to visualize construction workflows and decide how they could reduce construction time. Stakeholders could actively engage with the platform, providing feedback directly into the digital twin.

STREAMLINING CONSTRUCTION COLLABORATION

By leveraging SYNCHRO, ACCIONA streamlined construction planning for this citywide project, reducing staging time by 67% and drafting requests by approximately 88%. Additionally, the suite of applications allowed the team to ensure that workers were always a safe distance from live rail lines, ensuring secure operation of the rail network. The team could align around a plan that they felt confident would be successful. “Our challenges—they’ve now been eradicated because of the developments that have gone through into SYNCHRO,” said Easter. “And so, that now means that my team can focus on delivering the project rather than trying to make certain software to fit with one another.”

SYNCHRO was a key driver in ensuring successful project outcomes for ACCIONA. “Our digital approach, supported by Bentley Systems, helped deliver this landmark project safely, on time, and with minimal disruption to passengers and the public,” said Easter. “The success of taking this approach not only helps to deliver a critical physical asset, but also a valuable digital asset too.”



As part of the Southern Program Alliance, ACCIONA was tasked with removing level crossings and constructing new stations along the Frankston Line.



ACCIONA provided a digital asset to help create an intelligent digital Victoria.



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