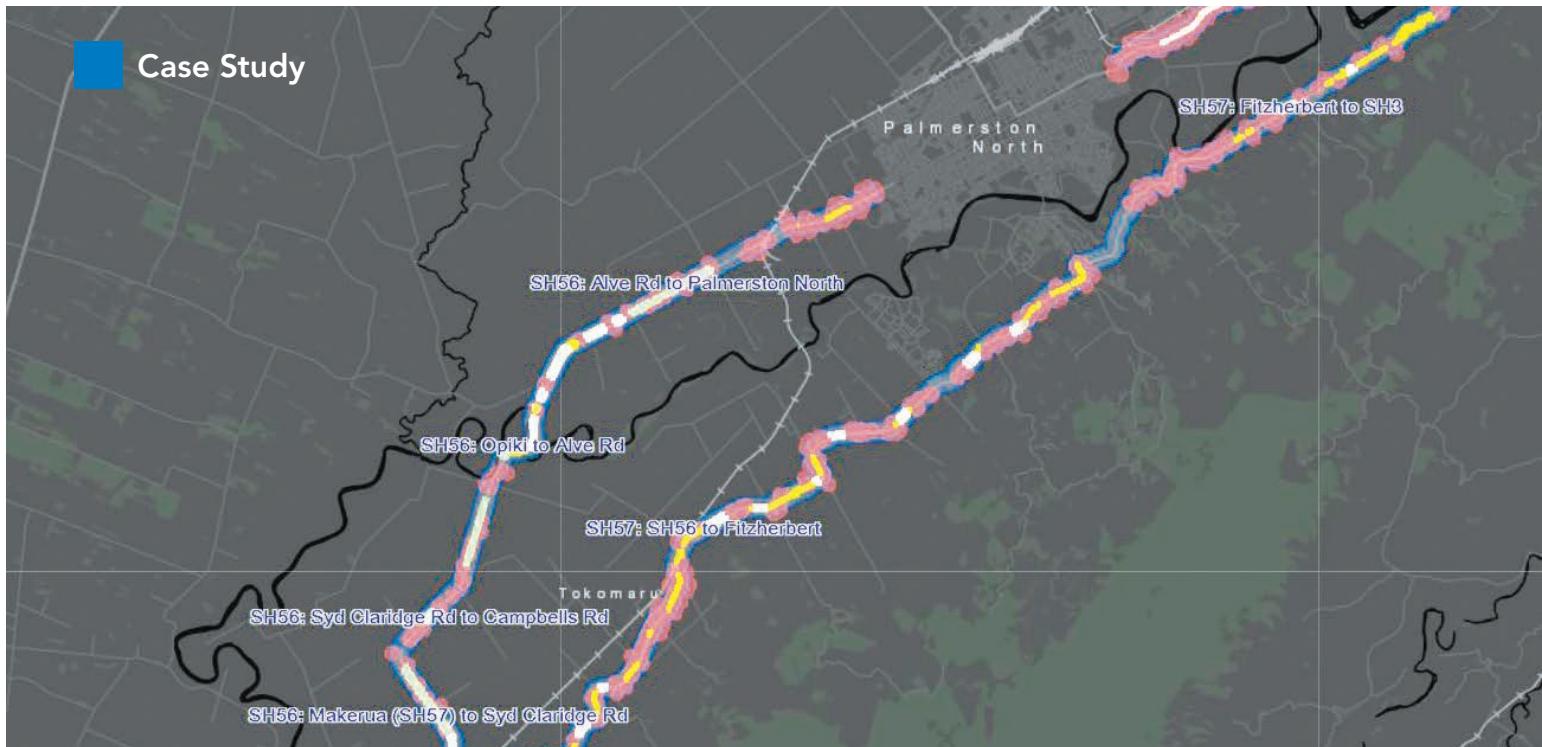


Case Study



ARCHITECTURE, ENGINEERING, AND CONSTRUCTION

User

Safety Boost Programme
in New Zealand

Challenge

Install rumble strips on regional state highways to reduce vehicle accidents and improve safety.

Solution

Use of ArcGIS by field crews to track rumble strip installation and collect data for quality assurance.

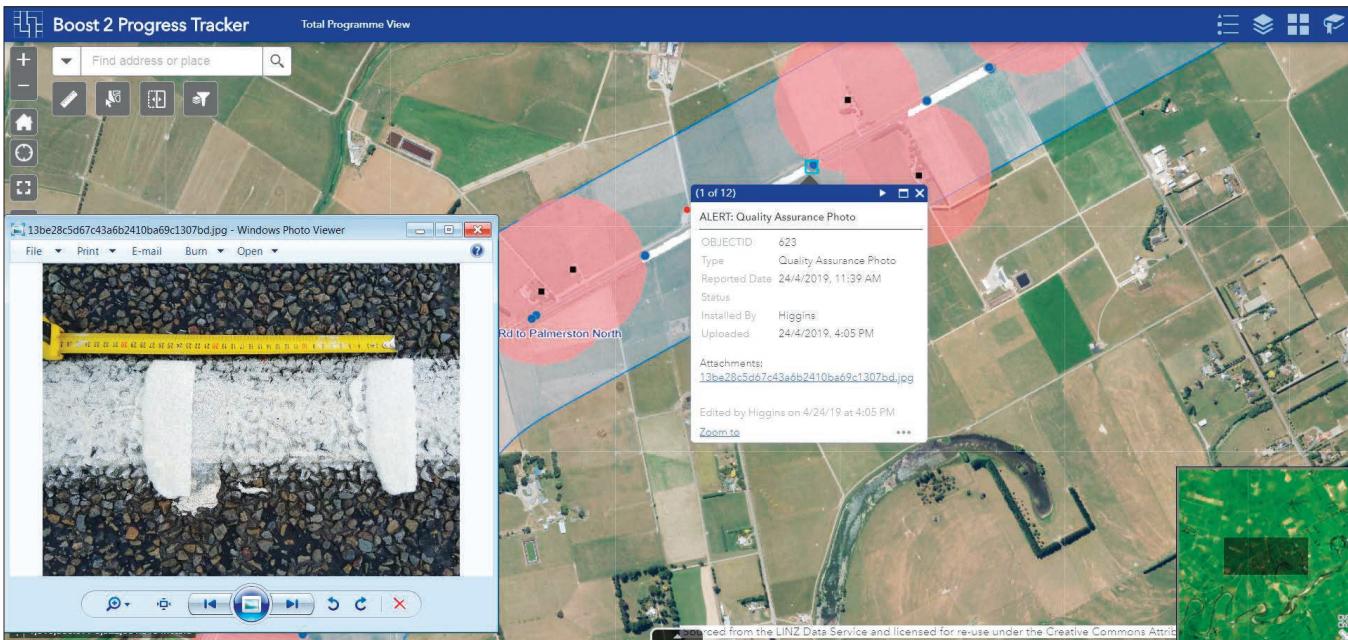
Results

Faster resolution of quality assurance issues. Real-time monitoring of installation progress in the field.

Rapid Mapping Boosts Road Safety Across New Zealand

Although New Zealand's landscapes are famous for their beauty, a combination of steep hills with tight curves and changeable weather requires a heightened level of driver attention at all times. Improving road safety is a top priority for New Zealand's government.

The NZ Transport Agency leads a programme of work to prevent deaths and serious injuries on New Zealand roads. One of its initiatives, the Safety Boost Programme, is making regional state highways safer through relatively low-cost improvements such as installing side barriers at high-risk locations, improving signage, and putting in rumble strips which make a rumbling sound if a driver veers across the centerline or onto the shoulder. This provides an immediate warning to drivers who are fatigued or distracted. The project team delivering the Boost programme streamlines all its efforts—installation, claims reporting, and quality assurance—with the use of electronic data capture in the field.



The Challenge

The Transport Agency established the Safety Boost Programme to accelerate safety improvements on regional state highways around the country. To prioritise the locations for improvement, the project team delivering Boost uses GIS to analyse different data types, including environmental and financial factors and historic crash trends.

"We are helping the NZ Transport Agency improve the safety of roads which affects everyone," said Liv Theunissen, who is a Senior Project Manager for Beca, one of the contractors helping to deliver the Safety Boost Programme. "If we can deliver these projects safely, economically, and on-time, then it's a win-win for everyone."

Installation of the second stage of the Safety Boost Programme began in February 2019 and included extensive application of rumble strips. As safety treatments are being installed on 11 regional State highways throughout the country, contractors needed a more efficient way to collect and send data from the field. The existing method involved manually entering data, such as where rumble strips had been installed, into an Excel spreadsheet and adding photos of completed work to a hard drive. This created an administrative burden for contractors and invited potential for errors.

Internal operations needed an overhaul to not only monitor quality but to keep things on track and on budget. The in-office quality assurance engineers also wanted a more effective way to monitor progress in the field and ensure work was performed on time.

The Solution

The project team chose ArcGIS QuickCapture to collect vital field data. ArcGIS QuickCapture is a data collection app that easily captures location, photos, and other attributes while traveling at speed from a car or vehicle. The team chose it because it is an advanced system that is push-button simple to use and allows data to be transmitted instantly from the field to a central database.

"With ArcGIS QuickCapture, we are more likely to deliver projects on time because we can see what's going on in the field real-time and monitor progress. We have a detailed, technical picture of our work."

Liv Theunissen, Beca

"The Safety Boost Programme is the first time ArcGIS QuickCapture has been tactically deployed. Because it was such a useful tool, we adopted it," says Peter O'Regan, Senior Associate, Digital Services at Beca. "We developed a proof of concept, tested it extensively, and it really worked surprisingly well. We now see a lot of strategic benefits from using it across wider operations."

ArcGIS QuickCapture's rapid data collection is used to track the installation of the safety improvements and allows contractors to take photos from the site and instantly send them to quality assurance engineers. Since the app can be used on workers' cell phones, it also eliminated the need for new equipment.

Summary data is also sent to the NZ Transport Agency. "Our approach is to bring data into a central GIS environment so that key stakeholders can see what's going on and where the money is being spent," says O'Regan. "This telescopic view is really changing the way we manage these distributed projects."

The project team also use Microsoft Power BI to track project spend and monitor rates of progress. In future, the ArcGIS Maps for Microsoft Power BI plug-ins will be evaluated to tie the progress maps directly against financial cost data and project metrics.

The Results

The use of ArcGIS QuickCapture allows the instant sending of photos and reports from the field, so contractors in the field now have a fast, easy way to gather and transmit data. Completing and reviewing spreadsheets made for a time-consuming process for contractors and quality assurance engineers, and field reports were more likely to contain errors.

Now, quality assurance engineers and project managers can quickly track progress, which has streamlined internal operations. The instantaneous reporting also allows engineers to address quality issues faster, rather than waiting for a monthly report.

"Across four different regions, there are a large number of contractor crews working five days a week installing large quantities of rumble strips, side barriers and signage. So, with ArcGIS QuickCapture, we can keep a view of the nationwide implementation from our central headquarters [in Hamilton, New Zealand]," says Theunissen. "Looking at photos and mapping data from one central location saves everyone time."

The rapid data transfer of ArcGIS QuickCapture also enables stakeholders to monitor the progress in the field in real-time, without contractors having to learn a complex GIS application.

As Theunissen says, "The real-time progress updates assist in productivity and resourcing discussions as we work towards achieving a very tight timeline. By mapping these assets as they are installed, we are creating a simplified 'as built' record which informs ongoing and long-term maintenance."

"The contractors have embraced ArcGIS QuickCapture because there's no learning curve with it. All they've got to do is tap a few buttons with their finger, and their work is mapped. It saves time and has been very well received," says O'Regan.

"It's a simple way to monitor placement and keep track of progress because we know how much of each treatment needs to be installed. And as they're sending this data, we can actively calculate their speed and rate of progress," adds O'Regan. "We have the ability to see the good and bad of what's going on and make much clearer decisions."

