CASE STUDY

RESILIENCE & ADAPTATION

NETWORK RAIL

GROUND ENGINEERING AWARDS 2021 WINNER

THE CHALLENGE

Network Rail owns and manages the UK's national rail network comprised of over 20,000 miles of track. They are dependent on the performance of more than 190,000 earthwork assets, mainly comprised of cuttings and embankments, in geologically diverse conditions. Managing critical infrastructure such as slopes and banks is an integral part of ensuring travelers and employees safety. Asset management policy requires periodic examination of critical infrastructure, often performed by in-person visits, examination, and repairs in remote locations. In the examination process, rail slopes are inspected and assessed to determine locations that might be vulnerable to landslides and thus require repairs and further maintenance. Due to the scale of the challenge and constraints of existing inspection and detection techniques, tracks can be susceptible to blockages caused by soil and rock landslide debris. This can lead to delays and disruptions to operations, and, in the worst case, to derailments and loss of life. A warming climate and record-breaking rainfall have resulted in a growing number of slope failures n recent years. As extreme weather events become more frequent and severe, failures can develop within a matter of minutes or hours.

SASB & GRI METRICS ALIGNMENT

PROFIT

- ✓ DECREASED REWORK COSTS
- ✓ EFFICIENCY COST BENEFITS OF INSPECTIONS
- ✓ REDUCED TRAIN STOPPAGES/MORE EFFICIENT PLANNING

PLANET

- ✓ ENVIRONMENTAL COMPLIANCE
- ✓ REDUCED EMISSIONS FROM LOWER NUMBER OF IN-PERSON INSPECTIONS
- ✓ EXTENDING LIFE OF EXISTING ASSETS

PEOPLE

- ✓ TOTAL RECORDABLE INJURY RATE
- ✓ NEAR MISS FREQUENCY RATE
- ✓ DECREASED ACCIDENTS

THE SOLUTION

Network Rail recognized that an advanced solution was crucial to manage increasing slope infrastructure failures which posed financial, environmental, and safety risks to the company. Previan, as a leader in remote monitoring technology, was selected to improve the efficiency and accuracy of detecting slope infrastructure failures.

RESILIENCE
In the face of a warming climate

ADAPTING
To ensure the safety of people and operational efficiency

SAFETY
Improvements through reduced derailment risk

COST
Savings from precise monitoring, reduced site visits, and increased efficiency

THE RESULTS

The InfraGuard wireless monitoring system reduces the need for onsite in-person routine inspections that often require staff to walk along the track to access the sites. Further, the photographic imaging is particularly helpful for engineers to differentiate false alarms, such as a fallen tree branch, from a problematic or potentially dangerous ground movement. Remote monitoring is able to prolong the time needed between expensive and highly polluting major engineering works, often involving the use of heavy construction equipment, steel and concrete. Through insight and intelligence from our sensor technologies, operators can have greater confidence to leave existing infrastructure as is.

Using our system, Network Rail was able to predict a landslip three days before it happened with the tilt sensors detecting the real-time ground movement and cameras providing photographic imagery to verify the debris on the track. This greatly reduced the risk of harm to passengers by avoiding train collisions with debris blocking the railway.

- **Fast and easy deployment of the technology**
- **Minimal maintenance Fewer site visits**
- **20km of track in 64 locations over 4 months**
- **Improved network resilience**

UN SUSTAINABILITY DEVELOPMENT GOALS (SDGs)

The SDGs provide an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. The goals listed here indicate the SDGs addressed in this case study.