

SMART Barrier

Wire rope barrier real-time monitoring system



The Challenge

With many 100's to 1000's of kilometres of wire rope barriers installed on regional road networks, maintaining the effectiveness of safety barriers is proving challenging for road authorities. Operationally these barriers are demanding more management time and maintenance effort.

Flexible barriers need ongoing repairs and maintenance, such as checking the tension of wire rope barriers to ensure that they perform as expected. VicRoads estimates that unrepaired barriers can be up to 34 per cent less effective at reducing serious injuries and fatalities.

Manual inspection and testing require implementing extensive lane closures with attendant traffic management. Notionally, flexible safety barriers (should currently) receive:

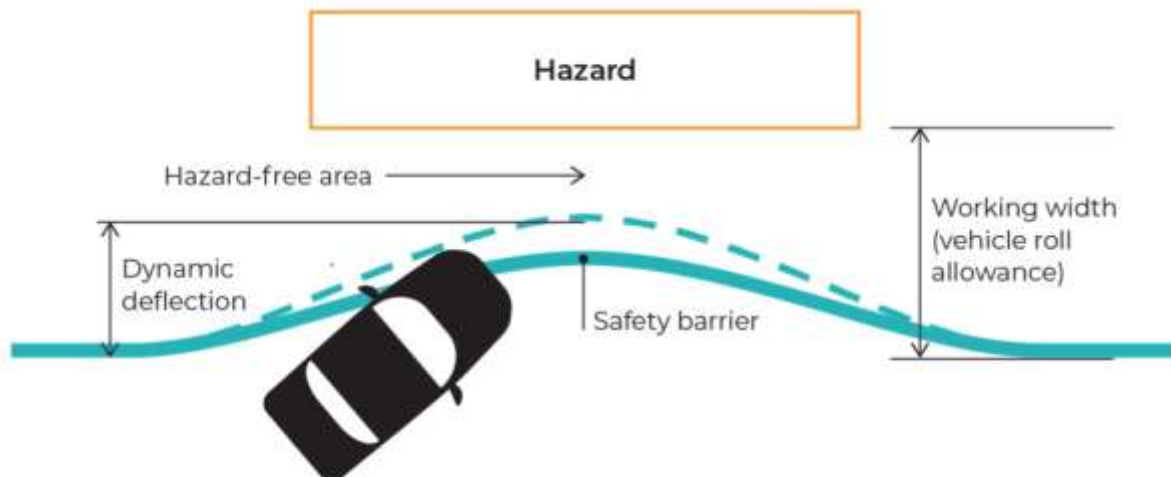
- Drive-by visual inspections according to arterial Road Management Category as defined in the Road Management Plan – daily to weekly or fortnightly.
- A reactive inspection or repair after an enquiry or report of damage or a collision.
- A regular (Level 1) visual and cable tension and bolt check and adjustments (one or two years apart according to manufacturer's guidance).
- In some jurisdictions, a 10-year detailed visual assessment for corrosion, tension check, bolt check and any running repairs or replacement parts.

Gaining greater insight into the status of wire rope barriers is crucial to improving maintenance management, but traditional manual and siloed processes are unable to provide the detail necessary to enable this on a regional network level.

Real-time monitoring and data aggregation platforms that provide region or state-wide reporting on conditions on transport infrastructure are increasingly being viewed as a requirement to meet oversight requirements under tightening maintenance standards and increased stakeholder focus.

Critical to the effective maintenance and management of wire rope barriers is ready access to real-time information such as:

- Barrier Location
- Operating Wire Tension
- Time, date and location of vehicle impacts
- Loss of Tension
- Maintenance Response Time



Our Solution

A Viotel SMART Barrier network can reduce the numbers of manual inspections and tension checks, improve triaging and scheduling of maintenance, reduce delays from major damage, minimise disruption and safety risks to workers and the public.

SMART Barriers advise network operators when cable tension warrants inspection or an impact has damaged posts, but the barrier remains effective. They record response rates and help provide accurate records of impacts.

The Viotel SMART Barrier monitor is a safe, self-contained sensor pack which is discrete, simple to install and calibrate, powered without large conspicuous solar power facilities and with analysis power deployed in an app accessing internet-based data, transforms a barrier from a disconnected unintelligent asset to a networked live data device.

It can:

- measure cable tension over time
- alert the presence of an impact and the location and time
- advise of environment conditions and the impact on tension and conditions at crashes
- provide an auditable record of maintenance response time in restoring barrier functionality

Benefits

1. Real-time monitoring, reporting and vehicle impact alerting functionality that can facilitate reduce emergency response times and improved barrier effectiveness through timely maintenance.
2. Eliminate unnecessary manual inspections and thereby reduce lane closures and traffic management costs.
3. Provide auditable data on barrier location and condition. Analytics capability to assess barrier maintenance effectiveness, vehicle impact frequency and location, maintenance response times.
4. The Viotel SMART Barrier system can be integrated with existing asset management systems and IoT platforms.
5. Subscription based SAS type model with reduced up-front deployment cost.

Features

Viotel's SMART Barrier harnesses 'Internet of Things (IoT)' technology and features a barrier mounted sensor and telemetry device, which streams real-time data to the Cloud hosted via Amazon Web Services (AWS). The SMART Barrier sensor unit is self-contained with a long-life battery and micro solar panel charger. Our devices are quick to install using basic hand tools and require no wired connections.



Viotel SMART Barrier Sensor

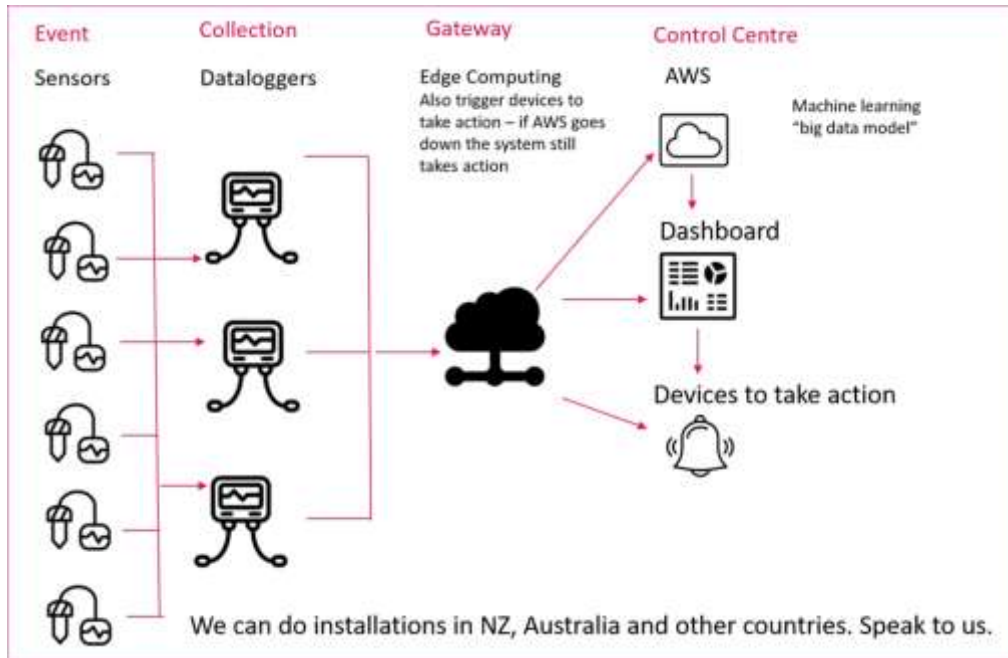
- Small, light, discrete but robust device, securely and readily mounted to a barrier.
- Built in GPS location.
- Seismic sensors & strain gauges detect tension changes and vibration in the cables.
- Provides real-time feed of information to operators via a smartphone app (as part of IoT), alerts associated with potential impacts on the barrier.
- Installed and calibrated quickly on-site.
- Solar powered, self-contained, designed to be set and forget for up to 5 years.
- Undergoing advanced product research and development - up to prototype number 3.

Vehicle impact alerts can be sent to mobile phones/email of emergency response maintenance personnel and asset managers.

VIOTEL

SMARTER DATA

Our SMART Barrier system provides data reporting and interrogation dashboards and data analytics via AWS. The Viotel SMART Barrier system is configurable to other IoT platforms and dashboard reporting systems.



Data are stored within the station and also streamed to the cloud using either mobile phone/data (low-power CatM1) or LoRa networks. Viotel's cloud platform has been built in partnership with Amazon Web Services, using high security certificate exchange to validate connections and encrypted data flows.

About Viotel

Our mission is to empower businesses with better data for better decisions. At Viotel we believe knowledge is power and understand the critical role data plays in managing risks, identifying opportunities and protecting business assets. Using 'plug and play' Smart Box technology, coupled with the power of Amazon Web Services, Viotel has created a data ecosystem. We believe in making smart technology smarter.

By continually investing in new technology and collecting and analysing data in real time, our cutting- edge solutions empower businesses to identify cost savings, increase productivity, streamline maintenance, increase OHS, monitor assets from any location and respond faster to emergencies.

Viotel currently have operations support in Australia and New Zealand.

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