Reliable automatic incident detection

Detection through all weather and light conditions

Wide range surveillance of bridge area

Automatic pedestrian and cyclist detection

Intelligent rules-based software, easily adaptable

Automatic vehicle tracking and classification

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Bolte Bridge

The twin cantilever Bolte bridge is the largest bridge in Australia and provides a critical link between Victoria Harbour and three major highways connecting Melbourne to New South Wales and Southern Australia. It is critical that the bridge remains operational 24 hours a day as a great volume of traffic and heavy goods vehicles drive through to access the port.

The Australian road network manager Transurban, appreciated that an advanced level of safety was needed on the bridge. Due to the high cost of the bridge infrastructure and the great volume of traffic, a video automatic incident detection (AID) system was installed during the planning phase. The application of video analytics however, proved problematic as the system’s accuracy and reliability of detection was seriously affected by strong vibrations as well as rapidly changing weather and light conditions.

Bolte bridge needed a reliable AID system with both high detection rates and low false alarm rates to keep the operator vigilant. Incidents need fast and accurate detection to maintain road users’ safety and traffic flow.

One particular issue was of great interest to Transurban. Access to the bridge is prohibited to pedestrians and cyclists and their presence is a safety risk for both themselves and other road users. Transurban needed a system that could provide reliable detection and tracking of movement of pedestrians and cyclists. A further requirement was that detection performance should not be affected by weather and light conditions and the on-going performance of the system should not be dependent on regular, expensive routine maintenance, which video AID is notorious for.

The Challenge
Enhancing Bridge User Safety

One issue Bolte bridge wanted to solve was that cyclists and pedestrian were not permitted access. The operators needed to be informed about cyclists and pedestrians potentially accessing the bridge area before they disrupted the traffic flow.

To solve this problem ClearWay was configured to provide an early warning to the operators. Its radars are able to scan a wide area in the approach to the bridge and detect any pedestrians or cyclists before they reach the bridge.

When a cyclist or pedestrian is detected, the operator automatically receives a warning alarm. The early warning enables the operator to deal with the potential breach before any major disruption occurs.
Early warning for fast emergency services response

Transurban initially tested two radar sensors on the bridge in different weather conditions, throughout the summer and the winter. The evaluation of the test demonstrated that ClearWay could operate no matter the weather conditions or how intense the vibrations were. Its low false alarm rate of less than one per day increased operators’ confidence in the system.

Following the success of the trial, eight units were installed providing all lane and hard shoulder monitoring for unauthorised pedestrian presence and stopped vehicles. The system provided continuous monitoring even in congested traffic situations.

The radars scan 360°, detecting cars up to 500m away and pedestrians at 350m. The 360-scan is done four times per second and this frequent revisit time gives the radar the best tracking performance. The long coverage of the radars minimises the cost of the project as less infrastructure needs to be installed and maintained.

ClearWay automatically detects incidents and raises alerts to operators in as little as 10 seconds. The system gives maximum time to manage the situation effectively and coordinate a response with emergency services.
About ClearWay

The system provides operators with an early warning of potential problems as its long-range sensors monitor not only all lanes, but also the approach to the bridge. Operators are alerted before pedestrians have even entered the bridge location.

ClearWay’s intelligent rules-based software applies advanced logic to interpret recorded data and generate alarms. The software easily integrates with other third-party traffic management systems.

With ClearWay installed, operators have detailed information and the exact location of events, improving how incidents are handled.

‘Navtech Radar’s product provided a level of accuracy and reliability that was not available through traditional AID systems. Transurban required a method of detecting pedestrians attempting to access Bolte bridge. Navtech was selected because of their ability to deliver a reliable AID solution.

Throughout our engagement, Navtech has shown their technical excellence in resolving all the challenges the project has presented.’

James Cuthbert, Transurban

Benefits

✔ Complete situational awareness
  Real-time location of vehicles and people to coordinate emergency response.

✔ All weather performance
  High performance even in extreme weather or lighting conditions.

✔ Early warning system
  Alarms within 10 seconds of a detected event.

✔ Rules-based software
  Set detection parameters and suppress alarms for specified conditions.

✔ Future-proofed road network
  Connected corridor features for autonomous vehicles.

✔ Third-party integration
  Automatically controls multiple cameras and sensors for complete situational awareness.

✔ Very low false alarm rate
  Finely tuned to provide a maximum of one false alarm per sensor per day.

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