

WEST GATE BRIDGE, WEIGH-IN-MOTION SYSTEM – MELBOURNE, AUSTRALIA



The West Gate Bridge in Melbourne, Australia is a steel box girder cable-stayed bridge and was originally designed to carry 40,000 vehicles per day with a maximum load of 25 tonnes per vehicle. Today, traffic volumes are now 160,000 vehicles per day with some B-double trucks weighing up to 68 tonnes each.

As a result, the bridge operator needed a method to estimate the operational and life span of the bridge. Q-Free was appointed to install a WIM system on the bridge to provide valuable data source for these calculations. However, the WIM system couldn't be installed on the approaches to the bridge because of too many on and off ramps. As a result the only feasible location for the system was to install it on the bridge deck.

Installation on the deck presented further problems; the deck is constructed with metal plate and a carriageway asphalt depth of only 50mm. This understandably presented considerable problems with loop detection.

Q-Free was able to provide an innovative solution to this problem using a combination of the HI-TRAC® 100 WIM classifier and MEAS BL Class 1 Piezoelectric sensors. Two piezoelectric sensors were installed per traffic lane into the 50mm asphalt layer on the bridge deck. The sensor cables pass through holes drilled through the asphalt, membrane and bridge deck to the cavity below. The HI-TRAC electronic system is installed inside the bridge structure. The HI-TRAC® algorithms were modified to work without the aid of the loop as an end of vehicle identifier.

