

AUCKLAND HARBOUR BRIDGE AUCKLAND, NZ

MOVEABLE BARRIER FOR MANAGED LANES
MOVEABLE MEDIAN APPLICATION



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CROSSOVER ACCIDENTS ELIMINATED BY A MOVEABLE MEDIAN BARRIER

The Auckland Harbour Bridge was opened as a four lane steel truss bridge in 1959. In 1969, rising traffic volumes led to the addition of two 2-lane steel box extension structures, one structure along each side of the original bridge, bringing the total number of lanes to eight. To provide additional congestion relief, overhead lane signals were installed to reverse the center lanes during morning and evening peaks.

By 1990, there were 140,000 vehicles per day commuting in and out of the city on this 8-lane structure. Unfortunately, this increase in traffic volumes came with an increase in accidents and fatalities. From 1984 to 1988, there were 10 fatalities due to crossover head-on accidents. A worldwide search and study to eliminate this problem was conducted by Works Consultancy Services, Ltd., and after a thorough investigation, the Quickchange® Moveable Barrier (QMB) was chosen. Construction of the new systems began in December, 1989, and the system was commissioned in November, 1990.

For the next 19 years, the moveable barrier was transferred four times a day to provide a 3/1, 2/2, 1/3 configuration in the four center lanes based on the needs of peak traffic. By combining flexible lane configurations with positive barrier separation, the moveable barrier system allowed the New Zealand Transport Agency (NZTA) to efficiently operate the

managed lanes facility while completely eliminating crossover accidents and the associated deaths and injuries. An additional benefit to the new barrier was the increased use of the two center lanes, as drivers felt safer in close proximity to oncoming traffic.

The original moveable barrier system was assumed to have a lifespan of 7-10 years, but it was 19 years before the system required an upgrade. The original 1.4 mile (2.2 km) managed lanes system was replaced in 2009 with a state-of-the-art moveable barrier system that allows the barrier to be transferred more than twice as fast. Transfers are now completed in 20 minutes on average, despite the 1:20 gradient and curved approaches to the north and south ends of the bridge. The new Barrier Transfer Machines can move the barrier as fast as 10 mph (16 km/h).

The original moveable barrier wall has been replaced with a modern Reactive Tension System (RTS-QMB®) barrier. The RTS-QMB is a high-performance barrier that offers extremely low deflection when impacted and superior containment and redirection of the impacting vehicle. The barrier passed EN-1317 test TB51, where it was impacted by a 28,000 lb (13,000 kg) city bus at 44 mph (70 km/h) at an impact angle of 20 degrees, with a deflection of only 5.6 feet (1.7 m). The barrier also has a narrow 18-inch (457 mm) profile, which gives more lane width back to drivers.

