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An end to turned down ends?
The moveable barrier system allows the city authorities to deal with directional traffic flow quickly, effectively and safely.

The debut on Australian roads of an innovative lane management system is already paying dividends on one of Sydney’s busiest roads. Bus commuters using the new Inner West Busway on Victoria Road are enjoying travel time savings of up to 15 minutes in the morning peak, thanks in part to the commissioning of the QuickChange Moveable Barrier System.

Nicknamed ‘The Zipper’, the barrier system is an integral lane management tool on the Busway, which is designed to provide dedicated bus lanes in peak periods between Gladesville and the Sydney CBD on one of the city’s most important public transport corridors. As part of the Busway project, a new three-lane bridge has also been constructed alongside the existing Iron Cove Bridge at Drummoyne.

The Zipper changes the lane configuration along a 1.4km length of the road corridor in the AM peak to provide a dedicated city-bound bus lane, while retaining three lanes for city-bound general traffic. By 10am the lane barrier is returned to the centre of the road, ready for the afternoon rush out of the city.

The Zipper system uses a series of concrete barriers that are picked up by a conveyor system and moved through a specially designed barrier transfer machine in an elongated S curve configuration. The system then moves the concrete barriers across one lane to create a new lane configuration.

The transfer machine used on Victoria Road has been custom designed, with fully enclosed operator cabins at either end to avoid having to turn the machine around on the roadway. Both The Zipper and the roadway are managed and operated by the New South Wales Government Roads and Traffic Authority (RTA).

Steven Issa, Manager of Planned Network Operations at the Transport Management Centre, said that The Zipper was chosen for the job on the basis of both safety and efficiency of operation. “It reduces the likelihood of a head-on crash by providing a physical separation between the carriageways, and it encourages pedestrians to cross Victoria Road at traffic signal controlled locations,” he said. “And because the barrier system is fully operated from within the transfer vehicle, workers are not on the road and exposed to traffic. In fact, during transfer the vehicle is physically protected and separated from traffic in both directions by the concrete barrier. It effectively travels in a ‘bubble’ with traffic travelling either side.” Issa said that the moveable barrier system has already proved its worth since it came into operation in January. “We are aware of at least one instance where the barrier physically prevented a vehicle crossing onto the wrong side of the road and potentially colliding with another vehicle,” he said.

In terms of efficiency, the lane transfer process takes only 15 minutes and requires only a single traffic lane to be closed during that period. Another important performance measure that drove the selection of The Zipper was the actual operation and reliability of the lane management system itself.

Issa said that on such a busy road, it is critical that the lane transfer arrangements can be implemented each weekday without incident or system failure. The Victoria Road barrier system cannot be moved without the use of the purpose-built transfer machine, but as an important safeguard, the machine can be towed to complete the lane transfer should there be a mechanical problem. To date, it has operated faultlessly.

Putting safety and operational issues to one side, the real success of the new lane management system is being measured in its contribution to the reliability and efficiency of bus operations on the Inner West Busway.
Since the Busway opened, the RTA says city-bound bus passengers travelling through Drummoyne and Rozelle are saving up to 15 minutes during the morning peak rush hour period. And although the commissioning of the Busway is primarily about improving public transport performance on the corridor, the RTA is also keenly watching to see what impact it has on general traffic flow.

The RTA says average travel times for city-bound general traffic on the corridor are still being assessed, but preliminary findings suggest they are similar or slightly improved since the Busway opened.

The same applies to traffic flowing in the opposite direction. Despite its initial success, the RTA says it has no plans to commission The Zipper system elsewhere on the Sydney network. Nevertheless, as an Australian-first application of this lane management system technology, it is certain that the RTA and the other road authorities across the country will be closely watching how it performs, and what longer term impact it has on congestion management.

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Hill & Smith looks ahead

Safety barriers can contribute heavily to the UN decade for road safety by reducing the severity of crashes. Properly specified barriers can ensure that vehicles stay in the roadway rather than colliding with roadside obstacles for instance. However, there are anomalies to be addressed in the sector. While common standards are required on barriers in Europe, there is still work to be done on harmonising the way the products are tested across the continent.

Mark Tonks heads up the Hill & Smith Roads division and he said that global progress on adopting standards is slowly moving forward, although progress is not uniform between the workzone and permanent standards improvement.

Tonks said that one specific area in which standards need to be developed further is for the connecting areas between conventional linear highway barriers and bridge parapets. However, he pointed out that steel highway barriers tend to be soft and forgiving on impact for the vehicle occupant, which is reflected in worldwide standards by their requirement to record severity indices during testing. However, bridge parapets tend to be rigid by nature, as they are encroached to the bridge deck. As a result, one of the most dangerous points on the road to impacting cars is at the interface between the standard highway barrier and the bridge parapet. If the barrier is too soft the car will embed too deeply and hit the bridge parapet (also called bridge rail) head on. Tonks said that the Hill & Smith Group ensures that its products meet safety needs by carrying out specific design and test work on these areas, as required in the standards. However Tonks cautioned that there is a move from some quarters of the industry to lobby for simulation to be carried out instead, as a replacement for the more costly transition testing process. Hill & Smith is strongly against this move according to Tonks and he explained that while simulation can provide useful design and engineering data, there is no substitute for physical testing to ensure that products meet standards.

The differences between European and US barriers standards also cause some issues worldwide. Authorities in developing nations can be unsure of which set of standards to adopt when establishing their own regulations or even specifying requirements on road projects. Tonks said that in some countries this can lead to confusion as to which standards are more suitable, slowing the implementation of barrier requirements.

As a leader in the field technologically, Hill & Smith is looking to boost its international profile. Tonks said that the firm is looking to expand beyond its successful position in the UK market, particularly in the Middle East, Sweden and the US. Partnerships are seen as a good future option for market growth and Tonks believes that there is strong potential for the firm to expand its business. He said that there are still comparatively few innovators in the vehicle restraint and ancillary safety systems market. He added that the company’s leading position in developing products and systems that focus on safety for the vehicle occupant and maximise space for road designers by limiting deflection of systems under impact should result in further growth.

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