

INQUIRY INTO HEAVY VEHICLE SAFETY AND USE OF TECHNOLOGY TO IMPROVE ROAD SAFETY

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and use of technology to improve
road safety

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23 February 2018

Mr Greg Aplin MP
Chairman of Staysafe
Joint Standing Committee on Road Safety
Parliament House
Macquarie Street
Sydney NSW 2000

RE: Heavy vehicle safety and use of technology to improve safety

Transurban is pleased to provide a submission in response to the New South Wales (NSW) Staysafe Committee's Inquiry into heavy vehicle safety and use of technology to improve safety. Ensuring the safety of our employees and customers is Transurban's highest priority. This includes the thousands of heavy vehicle drivers who use our roads every day, servicing NSW's construction sites and the freight industry.

Growth in freight is increasing the number of heavy vehicles on NSW roads, with approximately half of all road freight nationally and three quarters of all interstate road freight moving through NSW for at least part of its journey.¹ At the same time, strong investment in NSW infrastructure means more heavy vehicles on the road network servicing residential and civil construction sites across the state.

Despite significant improvements in safety, we know that heavy vehicles remain disproportionately over-represented in road fatalities. The Bureau of Infrastructure, Transport and Regional Economics' (BITRE) September 2017 Quarterly Bulletin reported a national spike in deaths from truck crashes in the year to September 2017. Deaths in NSW increased 86 per cent for the year, compared to reductions of 15 per cent and five per cent in Queensland and Victoria respectively.² We note the scope of the Inquiry has expanded to review the increase in road fatalities between December 2017 and January 2018. Transurban supports the NSW Government's recent policy announcement, which introduces a range of measures aimed at reducing fatalities across the NSW road network.³

Transurban's road safety strategy is based on the Safe System approach. The Safe System approach recognises human fallibility and vulnerability, and establishes road safety as a shared responsibility. In striving for fatality and injury free roads, we proactively engage with our customers, partners and the community. A recent analysis of injury crashes found there were significantly fewer crashes on Transurban's assets when compared to like roads.

Consistent with the Safe System approach, we believe road infrastructure can support and enable positive safety outcomes and that motorways are uniquely placed to address some of the safety challenges faced by heavy vehicles. This is reflected in the NSW Government's Road Safety Strategy 2021, which outlines that the way we 'plan, develop, design, operate and maintain roads is fundamental to ending road trauma'.⁴

Transurban welcomes further discussion with the Staysafe Committee on matters included in this submission. To arrange a meeting please contact [REDACTED]

Yours sincerely,

[REDACTED]

Tony Adams
Group Executive, Project Delivery

¹ NSW Government, Department of Transport 2011, Metropolitan Road Freight Hierarchy on the State Road Network, Practice Note

² Department of Infrastructure, Transport and Regional Economics, Bureau of Infrastructure, Transport and Regional Economics 2017, Fatal heavy vehicle crashes Australia Quarterly Bulletin July – September 2017

³ NSW Government 2018, Making NSW Roads Safer, Media release, available < <https://www.transport.nsw.gov.au/news-and-events/media-releases/making-nsw-roads-safer> >

⁴ NSW Government, Transport for NSW 2018, Centre for Road Safety, Road Safety Plan 2021

ABOUT TRANSURBAN

Transurban is a leading developer, operator and long-term concessionaire of urban toll road networks in Australia and the United States of America. Transurban owns and operates 15 motorway assets, comprising more than 1,300 lane kilometres* of toll roads, bridges and tunnels across Sydney, Melbourne, Brisbane and the Greater Washington Area.

We have built a track record of partnering with governments to successfully deliver and manage critical road infrastructure, and are recognised for developing innovative and effective transport solutions to meet the needs of growing cities.

In NSW, alongside our equity partners, we have interests in six toll roads within Sydney's orbital network—Hills M2, Westlink M7, M5 West Motorway, the Eastern Distributor, Lane Cove Tunnel and Cross City Tunnel. These roads are among the city's busiest commuter and freight routes with more than 700,000 trips recorded every workday. The NorthConnex tunnel project in northern Sydney is an example of how we have taken a proactive approach to address one of the city's most notorious transport bottlenecks with an innovative design that caters for future traffic growth.

We are currently working with the NSW Government to construct the \$3 billion tunnel, which will link the M1 Pacific Motorway at Wahroonga to the M2 Motorway at West Pennant Hills. This will bring the community significant benefits in terms of travel-time savings and reliability as well as completing the new national freight route linking the east coast of Australia.

At the time of assessment in 2017, Infrastructure Sustainability Council of Australia named NorthConnex as the nation's highest-rated road project-to-date. The recognition exemplifies our commitment to achieving industry-leading outcomes in all aspects of sustainability, including safety.

Transurban's vision is to strengthen communities through transport. To achieve this we take a big picture view of our roads and transport networks to provide smarter, safer, and more sustainable ways for people to travel. Our long-term concessions with governments create a strong incentive for us to actively manage these roads with a view to not only meet today's needs, but the future needs of communities.

Our highest priority is ensuring our employees and customers arrive home safely. We focus on providing a healthy and safe environment for our employees, contactors, customers and the community, while minimising impacts to the natural environment. Within Transurban's Road Safety Strategy, we have developed a road safety action plans in each of our markets. These plans are based on the four safe system pillars, with the fifth pillar (post-crash response) addressed through our road operations and incident response models.

Transurban's road safety key performance indicators measure the injury rate per 100 million vehicle kilometres travelled on our roads. A recent analysis of crashes on Transurban's roads by Monash University Accident Research Centre found that there were significantly fewer crashes on Transurban's assets, with NSW's rate 80 per cent lower than 'like' roads.

Our strong track record in safety contributed to Transurban being included in the 2017 Dow Jones Sustainability Index (DJSI) world leadership listing and awarded the Industry Mover Sustainability Award for the Transportation and Transportation Infrastructure sector. Within the Occupation Health and Safety component of the DJSI survey, Transurban was rated in the top two per cent of transport and transport infrastructure companies in the world.

In addition Transurban has invested in research to help reduce fatalities and the severity of injury on our roads by partnering with Neuroscience Research Australia (NeuRA) to establish the Transurban Road Safety Centre.

**Excludes projects currently under construction*

RESPONSE TO INQUIRY

In responding to the Terms of Reference (ToR) we wish to highlight the significant role road infrastructure can play in improving heavy vehicle safety and the power of industry collaboration in responding to heavy vehicle safety risks.

Across Greater Sydney more than 300,000 trips are made by heavy vehicles every day – making up around three and a half per cent of all trips. When these vehicles travel on local and arterial roads they may need to interact with vulnerable road users such as cyclists and pedestrians, while responding to sudden or unexpected traffic movements.

Non-urban country roads, local residential and neighbourhood streets, and intersections account for up to 75 per cent of all deaths and serious injuries on NSW roads.⁵ Encouraging heavy vehicles to use motorways over local and arterial roads delivers benefits to drivers, local communities, business and the freight industry.

Transurban's motorways have been purpose built for heavy vehicles. The design of our toll roads incorporate special features such as suitable pavement depth and grades, tunnel ventilation and break-down bays. Travel on the toll-road network also improves safety by providing direct routes.

Given the improved safety outcomes for drivers and local communities there is a significant economic benefit in heavy vehicle owner-operators and fleet operators using Sydney's toll roads. For the Sydney network, the benefits to business and freight users have been estimated to be \$2.8 billion (over 10 years). This includes:

- \$100 million in travel-time reliability benefits
- \$1.2 billion in travel-time savings, and
- \$1.5 billion in vehicle operating costs savings.

Additionally, the NSW Freight and Ports Strategy estimates that a one per cent increase in freight efficiency saves the national economy \$1.5 billion. For freight operators, reduced travel time can result in lower costs associated with fuel and wages.⁶

We work with our customers to ensure the way we build and operate roads helps their heavy vehicles travel safely when moving through the network. As a developer and operator of road infrastructure, we have provided general comments on in-vehicle safety and Connected and Automated (CAV) technology, preferring to leave specifics to vehicle manufacturers, technology companies and road safety agencies.

We encourage the Staysafe Committee to ensure implementation of the Safe System approach, creating a road system that aims to eliminate serious injury and fatalities from the network, through the interaction of safe people, travelling at safe speeds, in safe vehicles, on safe roads. We have provided an example of how this has come to life to address heavy vehicle safety in Victoria through the Victorian Vulnerable Road Users and Construction Trucks steering committee.

⁵ NSW Government, Transport for NSW, Centre for Road Safety 2017, Draft Road Safety Plan 2021

⁶ Transport for NSW, NSW Freight and Ports Strategy, Strategic Action Program 1 – Network efficiency

Industry collaboration

Transurban strives for injury and fatality-free roads. Our road safety strategy (Figure 1) is modelled on the Safe System approach, which takes a holistic view of the road transport system and the interactions among roads and roadsides, travel speeds, vehicles and road users.⁷

Figure 1 – Transurban Safety Strategy



Transurban's road safety strategy involves working with our customers, partners and the community to identify and address safety risks. A demonstration of this collaborative approach is our participation in the Victorian Vulnerable Road Users and Construction Trucks Steering Committee (Committee).

⁷ National Road Safety Strategy 2017, The Safe System approach, accessed 19 January 2018, < <http://roadsafety.gov.au/nrss/safe-system.aspx> >

Victorian Vulnerable Road Users and Construction Trucks Steering Committee

In mid-2016, VicRoads identified an emerging issue regarding the safety of vulnerable road users (VRUs), particularly pedestrians and cyclists, with the increased construction truck movements as a result of the significant infrastructure expansion in the Melbourne metropolitan area.

VicRoads convened the Committee comprising representatives from Melbourne Metro Rail Authority (MMRA), Level Crossing Removal Authority (LXRA), Transurban and the Transport Accident Commission (TAC). More recently a representative from the North East Link Authority, a planned road development linking Springvale Road to the M80 in Melbourne, has also attended the meeting. The committee's aim is to increase the standard of construction-truck-related activities to reduce the risk of serious injuries to VRUs.

Many of the participants represent major construction projects in Victoria, which will rely on heavy vehicles movements over years of project delivery. The first action of the Committee was a forum in December 2016 where representatives from industry, government agencies and other key stakeholders discussed the issues. Four working groups were established to explore the following topics:

- public engagement
- truck standards
- route selection
- traffic management.

The working groups meet regularly to understand the opportunities to improve standards, guidelines, policies, and communication activities with relevant audiences/stakeholders that can contribute to achieving the aim of the committee.

During its monthly meetings, the Committee identified an industry accreditation program that could be adopted in Australia - the Construction Logistics and Community Safety (CLOCS) scheme, which was developed in the United Kingdom by Transport for London.

CLOCS promotes collaboration between the construction industry and the public. The successful scheme works across industry to improve vehicle safety, ensure road safety is considered equal to work place health and safety, implement a common standard for managing work-related safety, and encourage wider adoption of best practice across the sector.

Using CLOCs as a model, the Committee is currently consulting with relevant stakeholders to develop a proposal for a state or nation-wide scheme modelled on CLOCS and the Safe System approach. As part of the development process the Committee has engaged with Sydney Metro (and other state and national bodies) to ensure industry standards are developed consistently across Australia.

The Committee and the work it is doing to progress industry-wide adoption of the Safe System approach through the leverage provided by major projects is a ready example of a coordinated and targeted way to increase heavy vehicle safety. We see the value of this approach being developed further nationally and encourage the Staysafe Committee to consider this as part of the Inquiry.

Transurban Road Safety Centre and Neuroscience Research Australia

An ongoing commitment to road safety has led Transurban to form a three-year partnership with NeuRA to establish the Transurban Road Safety Centre (Centre) — a dedicated world-class research facility.

The Centre was officially opened by the Hon. Brad Hazzard MP, NSW Minister for Health and Minister for Medical Research. The joint venture brings together research, business and government into a partnership aimed at working together to reduce injury suffered on our roads.

Housed at NeuRA's Headquarters in Randwick (in Sydney), the Centre is focused on research into practical injury prevention strategies. The facilities include a new state-of-the-art crash test sled capable of reaching speeds consistent with those experienced in real-life crashes.

The facilities provide researchers with the opportunity to study a number of growing trends on Australian roads. These include:

- aged driver and passenger safety, including the use of accessories such as seatbelt covers and cushions
- motorcyclist safety and motorcycle design, and
- rear seat occupant safety and restraint systems.

Through focused research on in-vehicle occupant protection the Centre seeks to reduce fatalities and the severity of injury on our roads. While heavy vehicles are not being explored as part of this research, **Transurban encourages the Staysafe Committee to consider how industry and government might partner with research organisations to investigate issues identified as part of the Inquiry process.**



Pictured: Associate Professor Julie Brown in the crash lab

Safe roads

Road quality is critical to the creation of a safe travelling environment for all vehicles. The Australian Automobile Association (AAA) oversees the Australian Road Assessment Program (AusRAP) – an initiative that star rates roads and produces maps showing the risk of road crashes that cause fatalities and serious injuries. The initiative also identifies potential improvements that could be made to reduce the likelihood of crashes. The aim of AusRAP is to provide a nationally consistent safety rating for roads.

The NSW Government's Road Safety Plan 2021 has identified star rating targets in its 'Building a safe future' priority area. Transurban is currently planning AusRAP assessments on our assets scheduled for completion by June 2018, including the Sydney orbital network, and we would be pleased to partner with the NSW Government on an ongoing program to ensure the learnings and any identified benefits can contribute to the safety of the broader road network.

Motorways can provide a more controlled and safer driving environment for heavy freight vehicles when compared with local or arterial roads. Between 2005 and 2015, NSW hospital records of serious injuries were matched with police reports on traffic incidents, the study found that three per cent of all serious injuries occurred on a motorway/freeway and 18 per cent on state highways compared to 79 per cent on unclassified local roads and other classified, lower order roads.⁸

Transurban uses a range of roadside technologies to improve heavy vehicle safety on our roads. In addition, through our major construction projects including NorthConnex and the West Gate Tunnel Project in Melbourne, we provide more efficient routes for heavy vehicles. These technologies and projects are profiled below.

Roadside technology

Overheight Vehicle Detection

Overheight Vehicle Detection (OHVD) systems are in place to prevent overheight vehicles entering height-restricted Transurban operated tunnels in Australia. In NSW, OHVD are in place for Lane Cove Tunnel, Eastern Distributor, and the Cross City Tunnel. The Hills M2 currently does not have OHVD as tunnel clearance heights are high, 5 metres (eastbound) and 5.3 metres (westbound). The new NorthConnex tunnels will be built to a high clearance of 5.3 metres and fitted with OHVD.

OHVD systems span the width of the road and detect overheight vehicles. Warning signs fitted with flashing lights are located downstream from the detector are designed to ensure vehicles have adequate time to pull off and exit before entering the approaching tunnel.

Overheight Vehicle Barrier (OHVB) systems act as final detectors and deterrents before a vehicle enters the tunnel. While systems vary depending on the individual tunnel, common systems often involve barriers made up of a series of blades hanging from an overhead gantry. Barriers are positioned after the last exit ramp and prior to the tunnel portals. If a blade comes into contact with a vehicle or its load, the material makes an audible sound to warn the driver. If a vehicle hits a blade alarms, along with images from a fixed surveillance camera, are transmitted to our traffic control rooms and operation and maintenance centres for response.

Tunnel barrier closure systems can also be used to warn and stop overheight vehicles from entering a tunnel. These systems close the road by using traffic lights and boom gates before the overheight vehicle is able to enter the tunnel. Finally, fixed barriers can be installed, which are designed to physically stop an overheight vehicle entering a tunnel.

While overheight detection and barrier systems help with deterrence, a small number of overheight vehicles continue to enter tunnels. In Victoria, there were 109 incidents involving overheight vehicles approaching the CityLink tunnels in 2017. Only one of these incidents resulted in an overheight vehicle entering the CityLink tunnel, with 108 prevented from entering by warning and closure systems. The single incident in CityLink caused the tunnel to be closed for over two hours.

⁸ Transport for NSW 2015, Serious Injuries in NSW 2005 to 2015

Beyond network-wide impacts, when an overheight vehicle enters a tunnel it puts the driver at significant risk, along with nearby motorists and their passengers.

Drivers from regional areas, who may be unfamiliar with city road networks may be unaware of the alert system and miss the warning signs. Drivers may also not know how to properly secure risky loads such as cattle or construction equipment.

Transurban encourages the Staysafe Committee to consider driver education as a component in decreasing the number of incidents involving overheight vehicles entering tunnels or restricted areas.

Heavy Vehicle Awareness System

In Victoria, the interchange between the Westgate Freeway and the Bolte Bridge was constructed in the late 1990s under space constraints that required relatively tight horizontal curvatures on its four ramps. Despite being constructed to appropriate superelevation, two of the ramps in Figure 2, Ramp N (which transfers traffic from westbound on the West Gate Freeway to northbound on the Bolte Bridge) and Ramp M (which transfers traffic from eastbound on the West Gate Freeway to northbound on the Bolte Bridge) saw a number of heavy vehicle rollovers as drivers tried to negotiate the curves at high speeds.

In response to this, CityLink Melbourne Limited commissioned the development of a Heavy Vehicle Speed Awareness System (HVSAS). The HVSAS is capable of identifying heavy vehicles (determined by a vehicle's length, measured between two fixed points), assessing the heavy vehicle's speed, and warning the vehicle if it is too fast as it approaches the curve on the ramp.

An evaluation was conducted to establish whether the HVSAS had been effective by comparing speeding behaviour observed in traffic surveys on the ramps before and after the HVSAS had been installed. While the investigation of Ramp N proved inconclusive due to problems with comparability of the 'before' and 'after' survey results, results from Ramp M indicated that the HVSAS had significantly reduced heavy vehicle speeds at the start of the ramp curve, even though heavy vehicle speeds at the point of entry to the ramp increased.

Figure 2 – Westgate Freeway and Bolte Bridge interchange



Automated placard checks

Heavy vehicles travelling on the road network sometimes carry inherently dangerous loads, which may be toxic, infectious, corrosive, radioactive, flammable or explosive.

In accordance with the Australian Dangerous Goods Code, vehicles carrying dangerous materials are required to display details of the goods class/division, and emergency information panels if required.

Some dangerous materials are prohibited from entering road tunnels. Transurban has an obligation to ensure vehicles carrying prohibited materials are deterred from entering our tunnels. In most instances, this involves information and warnings displayed on fixed signage. However in Queensland, Transurban has worked closely with the Department of Transport and Main Roads (TMR) to enhance deterrence measures by targeting offenders.

Legacy Way, Clem7, and AirportlinkM7 all have cameras in place to identify placards for prohibited materials. Where possible, details of the offending vehicle are sent to TMR for potential enforcement.

Point-to-point camera technology to reduce speeding

Heavy vehicles disproportionately contribute to road fatalities.⁹ Across Australia heavy vehicles only account for around three per cent of registered vehicles, yet they are involved in 14 per cent of vehicle crash fatalities.¹⁰

During the 12 months ending September 2017, 216 people died from 197 fatal crashes involving heavy vehicles or buses, with 96 of these occurring in NSW.¹¹

Previous estimations from the National Transport Commission indicate that if all heavy vehicles were to comply with speed limits all of the time, there would be a 29 per cent reduction in crashes.¹² One way to achieve reductions in speeding is through the use of point-to-point speed cameras.

Point-to-point speed camera enforcement is associated with very high rates of compliance. An evaluation undertaken in Norway in 2015 found that average speed camera enforcement reduces deaths by 49 per cent.¹³ They work by recording a drivers' average speed between two fixed points provide a more accurate picture of a driver's speeding behaviour than single fixed speed cameras.

NSW was an early adopter of point-to-point speed camera enforcement in Australia with reports indicating the technology covers around 650 kilometres of road. We commend the NSW Government for building on this, noting the recent announcement as part of the new Road Safety Plan 2021 for the implementation of point-to-point speed cameras in an additional 11 locations, including metropolitan Sydney.

While this technology currently only monitors heavy vehicles, **Transurban encourages the NSW Government to consider using the cameras to capture all speeding behaviour. If point-to-point cameras were applied to all vehicles, the network could expect to see further reductions in speeding and speed related road trauma.**

At Transurban we're committed to continually improving the safety of our motorways and have identified automated average speed enforcement as an opportunity for improvement. Transurban is keen to work with the NSW Government to explore further opportunities for point-to-point speed camera trials and roll-out on Transurban's NSW motorway network.

⁹ Transport for NSW 2014, Heavy Truck Fatal Crash Trends and Single Vehicle Heavy Truck Crash Characteristics,

¹⁰ National Road Safety Partnership Program 2017, Interactions between HV and LV quick facts, available <<https://www.nrspp.org.au/resources/nrspp-quick-fact-interactions-between-heavy-vehicles-and-light-vehicles/>>

¹¹ Department of Infrastructure and Regional Development, Bureau of Infrastructure, Transport and Regional Economics 2017, Fatal heavy vehicle crashes Australia quarterly bulletin Jul – Sep 2017

¹² National Transport Commission 2016, Enforcement Approaches for Speeding Heavy Vehicles, Policy Paper

¹³ Transport for NSW, Centre for Road Safety 2016, Speed Cameras Programs: 2016 Annual Review

Road networks

NorthConnex

Transurban and our Westlink M7 partners are proud to have started construction of NorthConnex, a twin 9km dual-lane tunnel that will link Sydney's M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at the existing Pennant Hills Road interchange. When complete, NorthConnex will link Sydney's north to the orbital network and form part of the National Highway route.

As it stands, if a heavy vehicle is travelling southbound along the M1 Pacific Motorway in Sydney's north, its most direct route to the Sydney orbital network is to use Pennant Hills Road. Pennant Hills Road is a congested arterial road which was named "the riskiest road in NSW" and one of Australia's accident hotspots based on motor accident insurance claims between 2016 and 2017¹⁴.

NorthConnex will redirect around 5,000 heavy vehicles each day off Pennant Hills Road allowing them to bypass 21 sets of traffic lights. Furthermore, using NorthConnex as an alternative route to the CBD from the north avoids up to 40 traffic lights on the Pacific Highway. It will also allow motorists to drive from Newcastle to Melbourne, without a single set of traffic lights.

As part of NorthConnex, integration work along the Hills M2 Motorway is underway to allow the safe merge of traffic from the tunnel onto the Hills M2 Motorway via a new westbound lane from Pennant Hills Road to the Windsor Road interchange.

By redirecting traffic from local and arterial roads onto a controlled motorway environment heavy vehicles will experience more reliable and safer travel conditions, while also returning local streets to local communities.

The NorthConnex tunnel incorporates a smoother and flatter gradient than traditional tunnel projects, which in turn, will allow vehicles to maintain normal travel speed. This means better fuel efficiency, reduced emissions and enhanced safety.

The design includes a tunnel for traffic in each direction, reducing the chance of a head-on collision and increasing operational safety. The tunnel is built for three lanes to meet future capacity but will operate as two lanes with a breakdown lane.

Dangerous goods and overheight vehicles will not be permitted in the tunnels and will be required to continue using surface routes. Once complete, NorthConnex will have the highest clearance of any road tunnel in Sydney at 5.3m. By comparison the M2 tunnel presently has the highest clearance in Sydney at around 5.1m and has not has any overheight incidents. Most tunnels in Sydney have a clearance of 4.6m.

Fire and Rescue NSW has been consulted in the development of the tunnel design and the associated fire, life and safety systems. The tunnel design will be consistent with current Australian and international standards, road design guidelines and industry best practice and designed to minimise the likelihood of incidents. Incidents would be managed in collaboration with the Transport Management Centre (TMC) to ensure overall network efficiency.

¹⁴ 2017 AAMI Crash Index, <https://www.aami.com.au/aami-answers/press-releases/melbourne-crowned-national-hotspot.html>

West Gate Tunnel

The West Gate Tunnel Project is an opportunity to enhance productivity for the freight industry, improving travel times and boosting safety and liveability for the community.

Without this essential west-to-port connection, truck drivers will continue to have two options: a longer and less efficient journey via the West Gate Bridge and Bolte Bridge, or an increasingly slow and more congested trip along inner-west arterial roads with traffic lights, difficult turns and a mixture of local traffic, cyclists and pedestrians sharing the road and abutting residential areas.

The West Gate Tunnel Project will construct a tunnel from the West Gate Freeway to the Port of Melbourne and CityLink – removing around 9,000 trucks from local streets in west Melbourne by giving trucks a more reliable and direct connection to the West Gate Bridge.

Trucks carrying dangerous goods or over-height trucks that are banned from tunnels, will also be able to avoid residential streets by using new ramps from the West Gate Freeway to connect to the port and fuel depots on Hyde Street.

With a new alternative for trucks, the Victorian Government will introduce 24 hour truck bans when the project opens in 2022 to ensure that trucks use the freeway and not local streets. Exemptions will apply to trucks with local origins and destinations. This ensures that local businesses can continue to receive and supply goods.

As part of the development of the West Gate Tunnel Project, all new structures constructed for the project will be built to SM1600 (160 tonne) and all existing bridges along the West Gate Freeway between the M80 interchange and Williamstown Road will be strengthened to 75 per cent of SM1600, which will accommodate up to 110 tonne loads depending on vehicle configurations.

Safe vehicles

Transurban supports the adoption of in-vehicle technologies to manage fatigue and other road safety risks, consistent with Transport for NSW's Draft Road Safety Plan 2021.

Monitoring driver behaviours, including fatigue, attention and speed will contribute to reductions in serious injury crashes involving heavy vehicles. Technologies such as 360 degree vision, blind spot detection and turning warnings (either visual or auditory) alert drivers to their surroundings and other road users, particularly the most vulnerable (pedestrians, cyclist and motorcyclists). Crash avoidance technologies including Auto Emergency Braking, Electronic Stability and Roll Stability Control Programs and Lane Departure Warning will also contribute to saving lives and crash costs based on research, analysis and modelling.¹⁵ These technologies should be mandated where clear evidence demonstrates benefits, and where there is a lack of supporting evidence, evaluated for effectiveness. **Transurban encourages industry adoption of vehicle design measures that reduce injury severity including under run barriers, flat nosed cabins and low height cabins.**

Human error is reported to contribute to over 90 per cent of crashes on our roads today.¹⁶ Connected and autonomous vehicle (CAV) technology will play an important role in increasing road safety for all drivers and vulnerable road users, with application specific to heavy vehicles.

Transurban is working with governments and industry to ensure that our road networks support CAV technology. In Victoria, we are currently running a series of CAV trials in partnership with the Victorian Government and Royal Automobile Club Victoria (RACV). The first phase finished in late 2017 and tested light vehicles with level two automation features along CityLink as well as community attitudes towards CAVs and CAVs adoption. For phase two of the trial we are exploring trials with more highly automated vehicles, and connected vehicle communications for improved safety. In NSW, Transurban is working with government to explore potential for similar trials to run on the Sydney network.

¹⁵ Department of Infrastructure and Regional Development, Bureau of Infrastructure, Transport and Regional Economics 2016, Heavy truck safety: crash analysts and trends, Information sheet 78

¹⁶ Australia and New Zealand Driverless Car Initiative, Driverless car benefits, available <<http://advi.org.au/driverless-technology/driverless-car-benefits/>>

Safe people

The Safe System approach supports road user safety through licensing, training and education systems and the shared responsibility of all road users to comply with the law and use the network safely. Public awareness campaigns and community engagement initiatives are a key way to ensure the road users understand key risks and consequences of using the network.

Research conducted by the National Truck Accident Research Centre on fatal crashes has found that on 93 per cent of occasions the truck was not at fault.¹⁷

Given the national freight routes and the significant levels of construction across Australia, particularly along the Eastern seaboard, a consistent approach to communicating heavy vehicles safety messages to both truck drivers and the broader public could potentially raise the level of awareness and increase safety.

Driver training can also improve the safety of other road users interacting with heavy vehicles. An outcome of the Victorian Vulnerable Road User and Construction Trucks steering committee will be a training module for truck drivers.

Transurban has confirmed its support for e-learning modules being developed by the National Road Safety Partnership Program (NRSP) to increase understanding of the interactions between heavy and light vehicles.

When completed, this e-learning module will be made available to Transurban employees and we will work with the NRSP on strategies to promote the module. **Given the success of the NRSP in engaging industry in road safety. Transurban would encourage the promotion of this module by the NSW government and its industry partners.**

¹⁷ National Road Safety Partnership Program 2017, Interactions between HV and LV quick facts, available <<https://www.nrsp.org.au/resources/nrsp-quick-fact-interactions-between-heavy-vehicles-and-light-vehicles/>>