NHVR
National Heavy Vehicle Regulator

Vehicle Safety and Environmental Technology

Uptake Plan

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Foreword

As heavy vehicle designs evolve, the inclusion of new technology is playing a growing role in improving safety, productivity and efficiency in the industry.

Many new vehicles include technologies that help drivers to safely operate their vehicle, reduce the number of movements required to complete a freight task, and minimise carbon emissions and road infrastructure impacts for the community.

Over the past two years the NHVR has sought to better understand the growing number of heavy vehicle safety technologies and the barriers manufacturers and operators face when adopting new technologies.

We recognise that there is very little consistency when it comes to installing newer types of safety technology.

The NHVR is uniquely positioned to support and encourage the uptake of new technologies in the Australian heavy vehicle market, and help industry and the community realise the benefits of a more modern fleet.

The Vehicle Safety and Environmental Technology Uptake Plan (the Plan) outlines a program of work the NHVR will undertake to accelerate the introduction of new safety and environmental technologies into the Australian heavy vehicle market.

The Plan contains five work packages that aim to encourage operators to incorporate newer, more technologically advanced vehicles into their fleets by:

- *removing regulatory barriers that limit the adoption of advanced technologies*
- *offering productivity gains as an incentive for the adoption of advanced technologies*
- *providing education to industry on the safety, productivity and environmental benefits of new vehicle technology.*

It will be delivered in consultation with government and industry, and will contribute to the delivery of the *National Road Safety Action Plan 2018–2020*.

The NHVR is committed to facilitating a safe, productive and efficient heavy vehicle industry while reducing impacts on the environment and community.

The Hon Duncan Gay
Chair of the Board

Sal Petroccitto
Chief Executive Officer

Introduction

As vehicle design has evolved, the inclusion of technology has progressively increased and now plays a key role in many fundamental systems and components of a vehicle. For example, the transition from mechanically actuated braking systems in early motor vehicles to air systems that are now being augmented or replaced by electronic systems.

Technology intended to assist the driver to safely operate the vehicle has also emerged and is becoming more common in heavy vehicles, as is technology that reduces the noise and noxious gas emissions of a vehicle when in operation.

Many safety systems have the potential to assist the driver of a vehicle to operate the vehicle in a safer manner and to reduce the number and severity of road crashes.

The *Heavy Vehicle National Law* (HVNL) tasks the National Heavy Vehicle Regulator (NHVR) with promoting the use of safer heavy vehicles and reducing the impact that heavy vehicles have on the community. To do this, the NHVR, using a mix of voluntary and regulatory approaches, is seeking to remove barriers to operators choosing safer vehicles, as well as providing advice and support to help operators understand safety technology and the potential benefits.

The Vehicle Safety and Environmental Technology Uptake Plan (the Plan) will implement the Transport and Infrastructure Council agreement by Ministers to the Heavy Vehicle Safety Package, which includes the following recommendation:

The development of a program of work to accelerate the introduction and uptake of safety technologies in the heavy vehicle fleet.

The Plan will also contribute to the delivery of the *National Road Safety Action Plan 2018–2020* (NRSAP), specifically:

- ***Priority Action 4:*** *Increase deployment of Autonomous Emergency Braking (AEB) in both heavy and light vehicles.*
- ***Priority Action 9:*** *Increase the market uptake of safer new and used vehicles and emerging vehicle technologies with high safety benefits.*
- ***Other Critical Action L:*** *Investigate the introduction of safer, cleaner heavy freight vehicles by minimising regulatory barriers.*

Framework

The NHVR is Australia's in-service regulator for all vehicles over 4.5 tonnes gross vehicle mass (heavy vehicles) in most Australian states and territories.

Under Australia's federated model of vehicle regulation, the mandating of minimum equipment and performance requirements for new vehicles is managed by the Commonwealth through the Australian Design Rules (ADRs). The NHVR plays a substantial role in the development of the ADRs through the peak national forum, the Strategic Vehicle Safety and Environment Group (SVSEG) and its associated working groups.

The *Motor Vehicle Standards Act 1989 (Cth)* and the future *Road Vehicle Standards Act 2018 (Cth)* applies a nationally consistent approach by preventing jurisdictions from applying more stringent local standards than the national standards. This, however, does not prevent in-service regulators from implementing productivity or safety initiatives. For example, a concession applied in-service that delivers a productivity improvement (such as a vehicle being allowed to operate at higher masses) could be balanced by additional safety and environmental requirements that are beyond those required by the ADRs.

So, although the NHVR is not able to mandate standards for new vehicles on a general access basis, it does have the ability to increase the uptake of vehicle safety and environmental technologies through road use initiatives, on behalf of a majority of jurisdictions. This includes offering productivity gains as an incentive for the adoption of safety and environmental technologies, collaborating on the removal of regulatory barriers (such as dimensional constraints) that otherwise limit the adoption of advanced technologies in the market, and providing technology advice to operators and fleet owners regarding the purchase of new vehicles.

Proposed initiatives

Based on consultation with a number of stakeholders, there are five work packages that will be progressed by the NHVR to increase/accelerate the uptake of vehicle safety and other technologies, with a focus on heavy freight vehicles.

1. **Advocate for the increased:**
   - a. **harmonisation of Australian vehicle standards to allow for the latest designs from origin markets; and**
   - b. **fitment of safety and environmental technology from those major market designs.**
2. **Relax access and use limits for vehicles fitted with the latest environmental and vehicle safety technology.**
3. **Ensure in-service requirements maximise the benefits of mandated technology.**
4. **Empower industry to make informed purchasing decisions.**
5. **Educate industry about vehicle safety and environmental technology.**

Work packages

Advocate for the increased harmonisation of Australian vehicle standards to allow for the latest designs from origin markets and the fitment of safety and environmental technology from those major market designs.

Issue definition

While Australia maintains a local heavy freight motor vehicle manufacturing capability, for the most part Australia is an import market, accepting vehicles that are built in three primary origin markets[1]. For heavy trailers and heavy omnibuses, while importing is present in the market, the majority of vehicles are locally manufactured. However, local manufacturing of both motor vehicles and trailers is strongly influenced by the primary origin markets as most of the designs, systems and components used are sourced from these markets.

Australia has committed to harmonising new vehicle standards (the ADRs) with international vehicle standards, such as the United Nations (UN) Regulations and where not available, major market standards such as those of the United States (US) or European Union (EU). The ADRs are now 90–95 per cent harmonised with the UN Regulations (depending on the vehicle category) with the remainder of standards being either necessary to address local conditions and operations or legacy requirements to be reviewed and revised as resources permit.

While the majority of the ADRs are aligned with international standards, a number of fundamental standards still remain unharmonised, for example standards relating to vehicle dimensions. Through consultation with stakeholders, it has been determined that although there is no UN standard for the width of a heavy vehicle, the lack of alignment of the Australian requirement with the major markets of the US or EU is a primary barrier limiting the uptake of some vehicle safety and other technologies. There are also other configuration related barriers such as axle group spacing and retractable axle transition masses that are less critical, but barriers none-the-less. While the differences in width limits around the world appear to be only a matter of millimetres, for heavy vehicles this can, and does, result in the removal and replacement of major components such as axles on a vehicle, which then becomes a major modification.

The vehicle width limits in the primary origin markets are:

- US: Federal Motor Vehicle Safety Standards limit width to 2.60m
- EU: EU regulations limit width to 2.55m
- Asia: Primarily aligns with the Australian limit of 2.50m

With regards to potential US or EU designed and/or built models for supply to the Australian market, Australian truck manufacturers and importers must take into account which vehicles can be modified to meet Australian width requirements and the cost of carrying out these modifications. Notwithstanding the cost of such modifications and the potential to interfere with existing sophisticated systems (the modifications typically involve chassis/drivetrain changes as well as bodywork changes) manufacturers are also sometimes compelled to remove other safety related components, such as drivers access steps and handles, and install smaller or less than optimally designed fittings. It is also known that sophisticated crane safety and stability systems from the EU have to be modified with a result that their effectiveness is reduced, in order to fit within the Australian width limit.

To manage the additional cost and dimensional limits, manufacturers will tend to opt to source base model vehicles that are not fitted with advanced systems (e.g. blind spot detection) given that the sensors used for these systems can exceed the Australian width limit.

Other important impacts on width restrictions for freight vehicles are the constraints in carrying internationally standardised loads (such as shipping containers) and the further limiting of under bonnet/cab volume to allow for increases in market demand for engine power along with the parallel demands of more sizable emissions control systems and associated cooling systems.

In further aligning Australia's regulatory requirements with major markets for heavy freight vehicles and so removing or reducing barriers, regulators need to ensure that safety is maintained. This may require additional safety systems from those major markets to be fitted to the vehicles.

Proposed work package

As an issue that affects all of industry and both new vehicle and in-service vehicle regulators, the Commonwealth and NHVR are committed to jointly progressing, in collaboration with all in-service regulators, a review of local vehicle dimension regulation. Informed by a joint presentation by a majority of heavy vehicle industry associations to SVSEG in November 2017, the initial focus of the work package is potential alignment of overall width limits.

As an initial step in addressing this issue, the NHVR initiated a project through Austroads to explore heavy vehicle mass and dimensions and the impacts on productivity and safety (NEF6116). The purpose of this project was to examine the effects (safety and otherwise) of increasing the width limit for Australian heavy freight vehicles and to provide evidence that could support any proposed policy and regulatory change to the ADRs and the Heavy Vehicle (Mass, Dimension and Loading) National Regulation. This project was completed in October 2019 and will now inform future consideration of this work package.

1 European Union, the United States of America and and Asia (primarily Japan).

This package of work will:

- *consider the case for harmonising Australian mass and dimension limits with other major heavy freight vehicle supply markets*
- *recommend possible amendments to relevant ADRs, and in-service vehicle standards as applicable*
- *inform road managers and authorities of the effects of potential changes to heavy vehicle width for the purposes of network access and for the purpose of parties considering follow-on changes to any requirements for additional safety systems to be fitted.*

The NHVR and stakeholders acknowledge that it is important to consider the fitment of systems that, in the first instance, can counter any perceived risk of slightly wider vehicles or provide assurance to the general public of the ongoing safety of wider heavy vehicles. In line with the latest international developments, these are:

- *updates to the fitment of rear vision devices (mirrors and camera systems) under UN Regulation 46*
- *the adoption of UN lane departure warning systems under UN Regulation 130*
- *the adoption of UN regulations for blind spot detection systems, currently under development.*

NRSAP: Other Critical Action L of the NRSAP identifies the removal of regulatory barriers that may hinder the uptake of cleaner or safer vehicles. This work package will deliver the first stage of work required to deliver on one of the barriers specifically identified in the Action Plan.

Priority Action 9 of the NRSAP identifies increased uptake of safer new and used vehicles as a priority action. Removal of regulatory barriers that prevent the uptake of newer safer vehicles from origin markets has the potential to contribute to this action.

Relax access and use limits for vehicles fitted with the latest vehicle technologies

Issue definition – Mass barriers for advanced emissions vehicles

Motor vehicles and trailers are no longer simple component vehicles—that is, vehicles made up of a central structure (chassis) onto which a series of independent components are attached that produce a complete vehicle. In modern heavy vehicles, the majority of systems on a vehicle are interconnected through a digital platform that touches and influences almost all vehicle systems. While this creates opportunities for more advanced safety systems that use multiple vehicle systems, it also creates new issues.

In Europe, a number of safety and emissions technologies are already mandatory on vehicles supplied to the market. This means that the safety technologies and emissions systems are interconnected. For these latest safety technologies to be brought to Australia voluntarily, where the market still prefers the older Euro V platform and OEMs supply product that meets this market preference, manufacturers need to adapt the systems to this older platform.

Rather than continue to use the older Euro V platform, some OEMs have decided to instead move to supplying advanced emissions vehicles[2]. An example of this voluntary move to an advanced emissions product is the decision by Scania to phase out the supply of Euro V vehicles to Australia and instead supply Euro VI compliant product.

Based on information collected from the recent Vehicle Technology Survey for all Euro VI vehicles supplied by Scania, the following safety technologies are offered as standard:

- *adaptive cruise control*
- *forward collision warning*
- *autonomous emergency braking (AEB)*
- *lane departure warning*
- *electronic braking systems*
- *stability control.*

The Truck Industry Council has indicated that the number of advanced emissions vehicles being supplied to the market is increasing with more OEMs making the decision to supply these vehicles in Australia. Similar to the Scania product offering, advanced emissions vehicles with an advanced safety package are also now available from DAF, Freightliner, Hino, Iveco, Mercedes Benz, UD and Volvo.

The safety package that has been observed accompanying advanced emissions product is among the best offered on any vehicle and demonstrates the notable consequential safety benefits that could be realised by harmonising other standards.

While the Commonwealth is continuing to consult on an appropriate timeframe for the mandatory adoption of Euro VI, for those that are voluntarily wanting to use the platform, there are considerable productivity and safety implications due to the increased weight that should be managed now.

During previous consideration of advanced emissions standards, one of the primary operator and user group concerns centered on reduced carrying capacity due to increased tare masses and the impacts this has on productivity and profitability.

2 A vehicle that complies with Euro VI or an equivilent international standard.

Proposed work package

A similar situation existed in 2006 when Australia moved from Euro III to Euro IV, namely around the loss in productivity due to the increased tare mass of Euro IV vehicles. As a payload critical industry, any absorption of permissible mass by the vehicle construction itself is one of an operator's key commercial concerns.

To address this for Euro IV vehicles, in-service regulators agreed to provide a 500kg mass concession on the steer axles of these vehicles, in return for better emissions and some other safety improvements. A similar approach could be considered regarding advanced emissions vehicles.

Providing an 'Advanced emissions mass concession' could be explored that would look at allowing a motor vehicle mass limit increase to advanced emissions vehicles, fitted with minimum width tyres and a number of key safety features that the NHVR considers would offer the greatest safety benefits. This mass concession should at a minimum offset the increased tare mass that results from the emissions and safety systems, but could also act as an incentive for operators to move to a vehicle with the advanced safety package.

If progressed, the NHVR will implement this proposal via a regulation change rather than a notice.

NRSAP: Priority Action 4 of the NRSAP identifies Autonomous Emergency Braking (AEB) as a vehicle technology with the potential to deliver significant safety benefits and prioritises its adoption. Requiring AEB to access this concession would be consistent with the action plan.

Priority Action 9 of the NRSAP identifies increased uptake of safer new and used vehicles as a priority action. Removing the commercial barriers posed by advanced emissions vehicles fitted with comprehensive safety technology would assist in the uptake of safer vehicles.

Other Critical Action L of the NRSAP identifies the removal of regulatory barriers that may hinder the uptake of cleaner or safer vehicles. Harmonisation with international standards that apply in origin markets represents regulatory efficiency.

Issue definition – General review of conditions under notices

Exemption notices[3] issued by the NHVR impose conditions of operation that mitigate any safety risk/s posed by a vehicle's non-compliance with regulatory requirements. In many cases, conditions imposed by notices seek to mitigate safety risks through the requirement to fit certain vehicle technologies. The technology required is based on the market at the time the notices are drafted. When new technology becomes available, it is often difficult to subsequently change the notice to require the newer technology to be fitted as doing so would be unfair on operators already operating under it.

However, this limitation should not prevent the NHVR from identifying conditions that were imposed in existing notices that could be relaxed in exchange for fitting newer vehicle technology that better addresses the particular safety risks. As part of the routine review and development of exemption notices, the NHVR will consider the use safety technologies to mitigate safety risks.

Proposed work package

The NHVR will review current notices to determine where conditions could be removed and a newer vehicle safety technology applied.

As an example, the *National Class 3 Heavy Vehicle 4.6m High by Construction Semitrailer Dimension Exemption (Notice) 2014 (No.1)* allows semitrailers used in certain combinations to be up to 4.6m high (compared to the regulatory limit of 4.3m) on certain routes. This notice however imposes a 90 per cent GCM cap on vehicles operating under the notice, based on concerns of the roll stability of these higher vehicles.

This notice could be amended to allow a 4.6m high semitrailer to operate at 100 per cent of gross combination mass (GCM) provided all trailers in the combination are fitted with roll stability control (stability control for a trailer) and it is operational. Such a change would have a number of benefits, primarily an increase in productivity for these trailers (4.25t increase for a prime mover-semitrailer combination), and an increase the uptake of roll stability control on trailers and the fitting of the necessary connections on hauling units to power the trailer systems. The secondary benefit would not only apply to 4.6m high semitrailers but also any other trailer the hauling unit was used to tow at other times.

Furthermore, when developing new notices, the NHVR will consider whether safety technology could be used to mitigate safety risk posed by non-compliance or to enhance the safety of vehicles operating under higher productivity schemes.

NRSAP: Priority Action 9 of the NRSAP identifies increased uptake of safer new and used vehicles as a priority action. Providing commercial incentive to operators who take up safety technologies will contribute to this action.

3 Vehicle Standards exemption notices issued under Chapter 3 of the HVNL and Access authorisations issued under Chapter 4 of the HVNL.

Ensure in-service requirements maximise the benefits of mandated technology

Issue definition

The Commonwealth recently completed Phase II of the National Heavy Vehicle Braking Strategy (NHVBS), which will see the mandating of Electronic Stability Control (ESC) on all new heavy trailers by the end of 2019 and on types of new heavy motor vehicles most susceptible to rollover and/or loss of control crashes from 2022. The Commonwealth identified that heavy vehicle crashes involving a rollover and/or loss of directional control cost the Australian economy approximately $375 million per annum. Implementing ESC is estimated to deliver a net benefit of $217 million over the next 35 years[4].

However, these benefits were based on the assumption that where ESC is fitted, it would be operable. While this assumption would be accurate for motor vehicles, it is not accurate for trailers, which receive their power from the hauling unit to which they are connected. While a power connection has been required to be fitted to new motor vehicles under Phase I of the NHVBS since 2014–15, it may not be fitted to vehicles built before that time.

To ensure the benefits of trailer stability control are realised, the NHVR could consider mandating the fitting of ISO plugs that power these systems to all hauling units. As an increase in stringency, the NHVR must undertake the necessary regulatory assessment of the costs and benefits of this proposal. Additionally, the NHVR will consider how to best leverage the presence of this technology when it is already fitted, either voluntarily or as a mandatory requirement under the ADRs.

Proposed work package

The NHVR will undertake a regulatory impact assessment and cost-benefit analysis, mandating the requirement for all heavy vehicles that are capable of towing a trailer with a gross trailer mass (GTM) in excess of 3.5t to be fitted with an ABS/EBS plug to power the advanced systems on a trailer it tows.

This would ensure that where safety systems were available, there is always the ability to take advantage of them by powering them.

NRSAP: Priority Action 9 of the NRSAP identifies increased uptake of safer new and used vehicles as a priority action. Considering measures that will ensure safety technology, where already fitted, can be better utilised to achieve safer vehicle outcomes is consistent with this action.

Empowering industry to make informed purchasing decisions

Issue definition

In an effort to drive smarter government vehicle purchasing decisions, all state and territory authorities have fleet purchasing policies in place. These policies outline the minimum requirements (beyond those regulated) that a vehicle must have to be eligible for purchase and use by a government agency. These policies are routinely updated and SVSEG is kept up to date of any significant changes or issues as part of its oversight of the safer vehicles component of the National Road Safety Strategy 2011–2020.

The benefit of these policies is that they allow government to lead by example through use of the safest vehicles. In addition, once vehicles are finished their fleet life after two to three years, these vehicles are sold to the public and improve the level of safety in the general fleet.

At the April 2018 meeting of the SVSEG, it was recognised that while light vehicle fleet purchasing guidance is well established, there is little guidance available to governments, vehicle operators, project managers or infrastructure projects about heavy vehicle fleet purchasing.

As the national authority on heavy vehicles and heavy vehicle safety, the NHVR is in a unique position to guide any purchaser about the minimum vehicle features they should look for in a heavy vehicle. The NHVR is also well positioned to provide guidance about specific applications (either sectors or projects) that could drive the uptake of safer vehicles into the heavy vehicle fleet. Finally, by developing a single recommended national safety package for some sectors, this could allow referencing of a consistent specification by those entering into contracts that include a heavy vehicle fleet.

4 Regulation Impact Statement Improving the Stability and Control of Heavy Vehicles (Department of Infrastructure, Regional Development and Cities, 2018).

Proposed work package

The NHVR will develop guidance material to assist general vehicle operators, fleet operators, project managers and others who purchase or influence vehicle purchasing decisions, to purchase safer vehicles.

This information should include general information that explains safety systems, how they work and when they are of benefit, but also focus on specific applications and specific technologies that would be of benefit.

The NHVR will also develop an engagement plan to encourage fleet purchasers such as local governments, large infrastructure project managers, etc., to contact the NHVR for advice about vehicle safety issues.

The NHVR would be seeking collaboration with SVSEG and particularly industry and operator peak organisations for this work package. It is recognised that industry and operator organisations hold a great deal of expertise on the available systems and in some cases provide a similar service for their members.

Once developed, the NHVR will advocate for the implementation of the HV fleet policy into local and state government heavy vehicle operations, procurement processes and infrastructure projects and contracts to drive the uptake of safer vehicles.

NRSAP: Other Critical Action K of the NRSAP identifies improved safety requirements for contractors and government funded projects as a priority. Development of a national heavy vehicle purchasing policy will directly deliver on this action.

Educate industry about vehicle safety and environmental technology

Issue definition

While regulators and industry can work to increase the presence of the latest safety and environmental technology in the heavy vehicle fleet, a lack of understanding of how these systems function and potential disabling or overriding of the systems in-service has the potential to undermine the benefits.

Making sure that drivers are aware of the systems, what they do, how they function and the impact they will have on their control of the vehicle is just as vital as fitting the technology in the first instance.

Proposed work package

The NHVR will, in collaboration with OEMs and industry associations, develop guidance material to assist vehicle drivers to understand the new technology that is fitted to their vehicles, how it functions, what they can expect when the system activates, how it can assist them in controlling the vehicle safely and also how to understand telltales and other system messages that they may be provided.

As an education piece, a communication and engagement plan must be developed to describe how the NHVR will deliver this content and that considers multiple ways that we can have our message(s) reach heavy vehicle drivers. This could include safer vehicle demonstration events and coordination with vehicle manufacturer delivered driver training.

For further information about the NHVR's activities, functions and services, please visit our website or contact us via:

National Heavy Vehicle Regulator
PO Box 492
Fortitude Valley QLD 4006

P 1300 MYNHVR (1300 696 487)
E info@nhvr.gov.au

www.nhvr.gov.au