

16 August 2019

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National Transport Commission
Att: HVNL Review Project Team
Level 3, 600 Bourke Street
MELBOURNE VIC 3000

NHVR's SUBMISSION TO THE EFFECTIVE FATIGUE MANAGEMENT ISSUES PAPER

The National Heavy Vehicle Regulator (NHVR) welcomes the opportunity to respond to the critically important Heavy Vehicle National Law (HVNL) Review Issues Paper on *Effective Fatigue Management*.

As the national regulator of heavy vehicle operations, the NHVR is uniquely positioned to understand the challenges created by the existing law as well the law's impact on heavy vehicle users and the safety and efficiency of the broader transport task.

Through the Australian Fatigue Safety Forum and subsequent meetings and workshops, the NHVR has been working with key industry representatives to develop key strategies to improve fatigue safety performance across Australia.

In terms of fatigue safety, the consensus view is that the HVNL review must deliver a multi-tiered approach incorporating both risk-based and prescriptive arrangements. Those within industry capable of demonstrating effective driver fatigue risk management should face minimal interference from prescriptive requirements, whereas those less capable in fatigue risk management should face more prescriptive requirements to supplement any shortfalls.

The NHVR believes that improved safety outcomes can only be achieved when the law adopts the safest standard possible for fatigue management – fatigue risk management. To achieve this, we believe that the review must deliver five (5) key reforms:

1. Adopt fatigue risk management as the default fatigue safety object of the law.
2. Introduce a rule development power to enable the regulator to develop standards for work and rest hours, record keeping and alternative means of compliance.
3. Remove prescriptive standards for work and rest limits and record keeping into subordinate standards.
4. Revise provisions being retained to correct any errors or inconsistencies.
5. Introduce a power for no-fault investigations and reporting for building knowledge.

The NHVR has also been working with heavy vehicle operators to conduct the NHVR's Fatigue Monitoring Trial. This trial is still in progress and we provide a summary of our initial findings in this submission. However, it is clear, even in these early stages that there are potential fatigue safety benefits from regulatory recognition. The Regulator believes that such recognition is essential if these technologies are to be taken up by the majority of heavy vehicle users.

We also recognise that ensuring fatigue risk management becomes the primary focus as well as introducing regulatory recognition of fatigue monitoring technology are significant changes and that further policy work is needed to define and refine these concepts. However, as we observed in our previous submission on risk-based, it is critical to make the most of the review opportunity to develop an expert legislative base to enable regulation that encourages and adapts to the evolving needs of the heavy vehicle industry.

Finally, while the National Transport Commission is working to timeframes set by Ministers at the Transport Infrastructure Council, the NHVR suggests that a six-month delay in the Consultation Regulatory Impact Statement is needed if these concepts are to be included in the options being presented for consideration. This would provide adequate opportunity for these concepts to be developed to sufficient maturity to allow open and transparent scrutiny for regulatory purposes.

To avoid delays to the full delivery of the HVNL review, we propose that the Regulator works with the NTC to develop a transitional plan compatible with the proposed new HVNL requirements and that the Regulator implement this plan using our current administrative powers in parallel with the legislative process, where possible, to expedite the transition to the new arrangements.

Yours sincerely

A handwritten signature in black ink, appearing to read 'SPe', followed by a long horizontal line and a stylized flourish.

Sal Petrocchio
Chief Executive Officer

Effective Fatigue Management – NHVR's Submission

Recommendations

The NHVR recommends that the Heavy Vehicle National Law is amended to

1. Adopt fatigue risk management as the primary fatigue safety object of the law.
2. Introduce a rule development power to enable the Regulator to develop standards for fatigue risk management, work and rest hours, record keeping and alternative means of compliance.
3. Relocate prescriptive standards for work and rest limits and record keeping into legally binding subordinate standards.
4. Revise retained provisions to correct errors and inconsistencies in law.
5. Introduce a power for no-fault investigations and reporting for building knowledge on the antecedents of heavy vehicle crashes caused by driver fatigue.

Fatigue Safety Performance in Australia

Consistent with the finding of the NTC's review of the heavy vehicle driver fatigue data, the NHVR has found no definitive national source of information on the role of driver fatigue in heavy vehicle crashes. However, in the absence of this information, the NHVR has investigated non-regulatory datasets to determine which data provides the most reliable indicator for time-series analysis.

The NHVR believes that the National Truck Accident Research Centre (NTARC) review of NTI Major Accident Investigations provides the most valid and reliable data for understanding the impacts of regulatory arrangements based on the frequency and consistency of data collection and analysis.

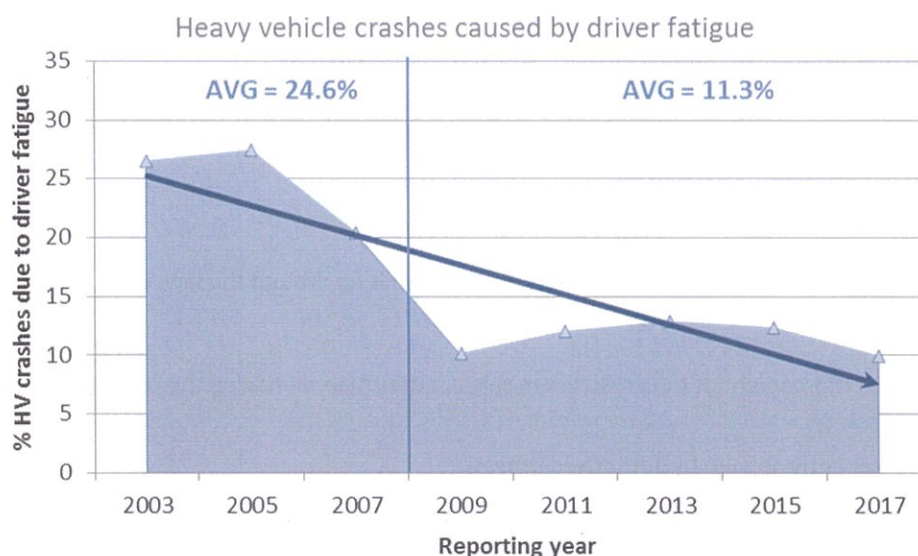


Figure 1 Trend in heavy vehicle crashes caused by driver fatigue in Australia between 2003 and 2017

The NTARC data on heavy vehicle crashes caused by heavy vehicle driver fatigue between 2003 and 2017 is shown in Figure 1. This data indicates that the rate of crashes caused by heavy vehicle driver fatigue has dropped since the Heavy Vehicle Driver Fatigue reform (the precursor to the current HVNL fatigue management requirements) was introduced in 2008, with the average rate in the years prior to the reform was substantially higher than the average rate in the years since the reform (24.6% versus 11.3%).

However, the NHVR notes that the rate of heavy vehicle crashes caused by driver fatigue has been relatively stable between 2009 and 2017.

Australian Fatigue Safety Forum

The apparent stagnation in fatigue safety performance in terms of heavy vehicle crashes caused by driver fatigue is of concern to the Regulator. To understand the factors that led to this result, the Regulator conducted two Fatigue Safety Forums with leading heavy vehicle industry representatives.

The first Fatigue Safety Forum, held in October 2018, investigated the perceived barriers to fatigue safety in the current operational context and identified key themes for the new fatigue management regulatory framework.

In the second Fatigue Safety Forum, held in July 2019, participants discussed specific goals and options for fatigue risk management including assessment and compliance requirements for each option and transitional initiatives.

The key findings from both forums are discussed in detail in the following sections.

Current Challenges

Participants in the Fatigue Safety Forum identified several key challenges in the current environment that they believed led to the stagnation in the fatigue safety performance.

The first key factor was the HVNL itself, which they perceived as ineffective because it:

- Relied too much on work and rest hours limits (not driver fatigue).
- Didn't adequately recognise or encourage fatigue risk management of technological developments.
- Was overly prescriptive and unnecessarily complex.
- Was not uniformly applied.

The second challenge was the regulatory framework that had built up around the law, which they perceived as undermining voluntary compliance because it:

- Focused on enforcement of the prescriptive rules, rather than managing the risk and controls of driver fatigue.
- Was inconsistently applied by authorised officers.
- Created disincentives to investing in positive safety practices (like fatigue monitoring technology or Advanced Fatigue Management (AFM)).

The third challenge to fatigue safety was meeting the physical demands of moving freight around Australia given the current road conditions and rest area availability.

The final two challenges are both related to knowledge of fatigue, the risk factors for fatigue and the potential planning and other controls needed to reduce fatigue risks. Participants in the forum were particularly concerned about inadequate driver preparation and training to allow them to understand the rules. They also raised concerns that there was inadequate industry education as a whole to allow operators to maintain basic safety standards.

A new fatigue management regulatory framework

Participants unanimously supported the HVNL and fatigue management regulatory framework being reformed to enable improved fatigue safety and support industry in managing the risks of driver fatigue. This approach was supported because participants agreed that the current prescriptive approach of the HVNL will not deliver better fatigue safety outcomes because:

- Compliant activities can be unsafe.
- Non-compliant activities can be safe.
- The focus of the law is too narrow.
- The law is too complex to be applied consistently.

Whilst recognising that caps on hours are necessary for some segments of the industry, participants felt that the regulatory framework should reward those with good safety practices **as well as** discourage those with bad safety practices.

The various discussions and workshops resulted in 10 key themes for a future fatigue management regulatory framework, representative of overcoming the current shortfalls and delivering a stronger culture of safety, not just compliance. The 10 themes are represented in Figure 2, below.

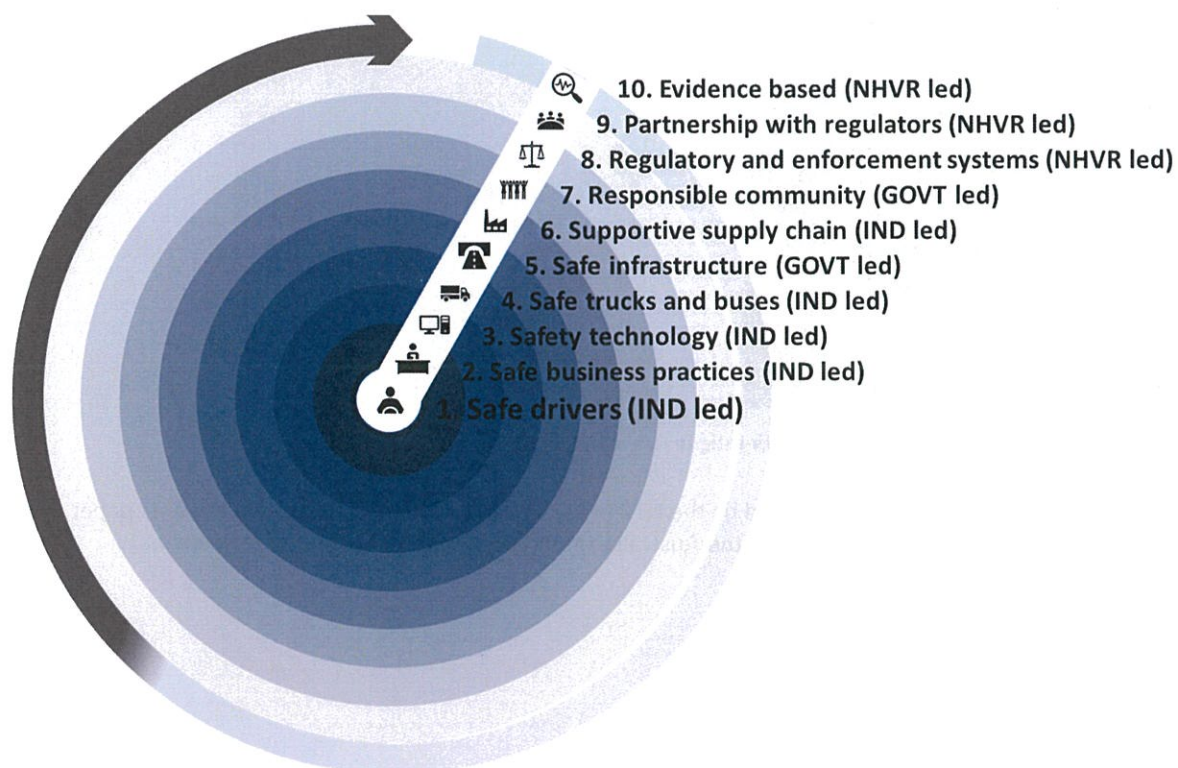


Figure 2 Themes for a new fatigue management regulatory framework

Goals for the HVNL Review

At the second Fatigue Safety Forum, participants and the NHVR discussed how to use the HVNL review to deliver the new fatigue management framework described above. They agreed on seven goals for the HVNL review, being:

1. We need to manage fatigue risks, not just rely on measuring hours of work.
2. A new and realistic approach to enforcement of fatigue safety risks is essential.
3. A flexible fatigue risk safety framework is critical to effectively manage risk as it increases.
4. Get the HVNL right with this review – more time is required to get it right.
5. All participating states must have the same Law, with no derogations.
6. Transition period reforms are also important while HVNL changes are considered.
7. Achieving better fatigue safety is a whole-of-community social licence issue.

In terms of managing fatigue risks, the NHVR notes that while AFM offers the most flexibility under the current work and rest options and is based on fatigue risk management principles, it was significantly under-utilized compared to Standard Hours and Basic Fatigue Management. Participants agreed but confirmed that the key focus of the HVNL review for fatigue safety should be on encouraging participation in fatigue risk management, effectively flipping the current arrangements upside down, as represented in Figure 3, below.

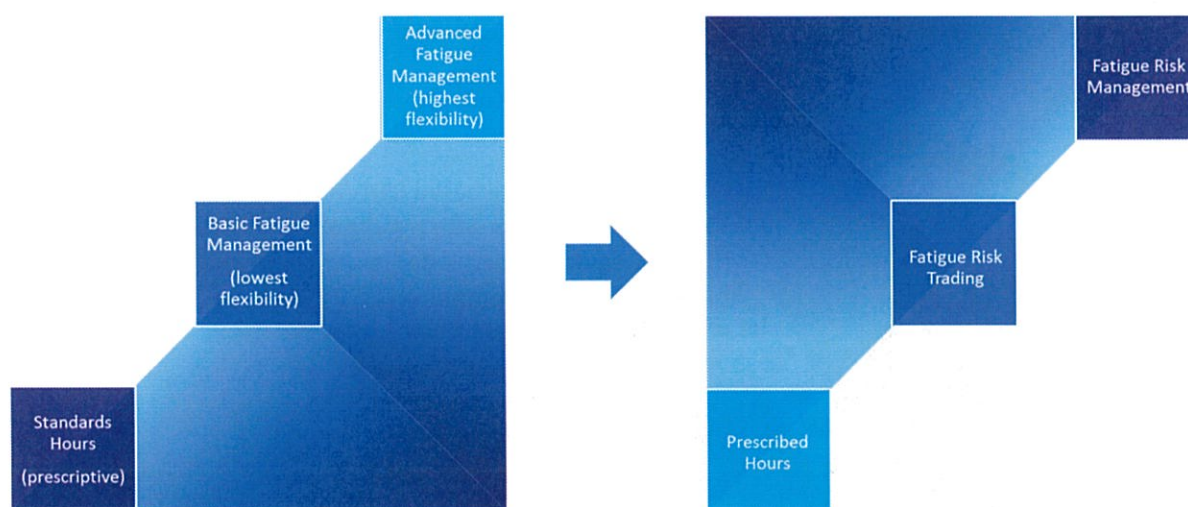


Figure 3 Representation of safety culture shift for fatigue risk management

The NHVR's responses to the questions posed by the NTC in the *Effective Fatigue Management* issues paper draw from the goals agreed by participants in the Australian Fatigue Safety Forums and are shown in Attachment A of this submission.

NHVR's Fatigue Monitoring Trial

As a consequence of unanimous support from participants in the Australian Fatigue Safety Forum, the NHVR commenced the Fatigue Monitoring Trial in late 2018 to gain a greater understanding of how fatigue monitoring technology works and are used.

The purpose of the trial is to determine how best to encourage industry uptake of technology that monitors drivers and detects fatigue and/or distraction. Fatigue and distraction detection technology/devices have the ability to identify potential incidents caused by heavy vehicle driver fatigue before they occur. The concept of preventing crashes rather than looking at them post event is a challenging but unique opportunity to make a real and positive difference in fatigue safety on our roads.

The trial is being conducted in five phases between January 2019 and June 2020 being:

- | | |
|-------------------------------|--|
| Phase 1 (Research) | Review of the relative merits/disadvantages of currently available fatigue/distraction detection technologies. |
| Phase 2 (Analysis) | Analysis of records and data from operators currently using the technology to assist in identifying ways to facilitate the successful adoption and use of fatigue and distraction technology by the road freight industry. |
| Phase 3 (Testing) | Field assessment of technology to assess adaptability for operator use and validate key findings from Phase 2. |
| Phase 4 (Consultation) | Consultation with industry stakeholders on potential use of technology to manage fatigue and its inclusion in the Heavy Vehicle National Law. |
| Phase 5 (Reporting) | Completion of reports for Phases 1 to 4. |

Phase 1 is now complete, while the interim report from Phase 2 is currently being drafted and summary of key findings is follows. In terms of the types of fatigue monitoring technology, the available suggest that:

- Fatigue and distraction technologies can identify and address fatigue incidents before they impact drivers' operation of the heavy vehicle.
- The concept of preventing crashes has not been definitively tested.
- Technologies could be categorised into six key paradigms:
 1. Fitness for duty tests.
 2. Continuous operator monitoring - Oculomotor measurements.
 3. Continuous operator monitoring – EEG – Electroencephalography.
 4. Other continuous operator monitoring technologies.
 5. Performance based monitoring.
 6. Vehicle related technologies including crash avoidance technologies .
- Each paradigm has potential safety benefits and disadvantages, depending on the operational risks faced and the safety management approach adopted by user.
- Oculomotor measurement devices or face monitoring systems utilising in-vehicle cameras provide real-time monitoring of driver fatigue and also driver distraction.
- Devices should not be implemented as a stand-alone tool for fatigue management.

In Phase 2, the Research team interviewed 85 participants from 12 heavy vehicle operators and seven technology providers from across Queensland, New South Wales and Victoria. The preliminary data from these interviews shows overwhelming support for regulatory recognition of fatigue monitoring technology by heavy vehicle operators and a strong belief that the use of fatigue monitoring technology will reduce both fatigue and distraction related incidents and improve fatigue safety.

However, in terms of legal changes needed to increase the uptake of fatigue monitoring technology, the research team observed that merely extending prescriptive arrangements to cover fatigue monitoring technology use would not be sufficient. Rather the laws must shift the regulatory focus away from compliance and create condition where heavy vehicle drivers have an irreproachable 'authority to stop work' where the technology indicates a fatigue or distraction event and there is a shared responsibility between heavy vehicle drivers and operators to determine and proactively manage fitness-for-work.

In addition to legal changes, the research team has identified safety cultural aspects essential to delivering the anticipated safety benefits. These are

- Probabilistic decision making by heavy vehicle operators.
- Legally and scientifically defensible risk assessment and mitigation strategies based on Safety Management Systems principles.
- Creation of indicative standard operating procedures (SOP's) for heavy vehicle operators.
- Collaborative data exchange between users and the Regulator to accelerate learning cycles on risk factors in heavy vehicle operations across Australia.

The NHVR's responses to NTC's questions in the *Effective Fatigue Management* issues paper have incorporated these findings, where appropriate.

Timing of the review of the HVNL

At the *Australian Fatigue Safety Forum*, participants observed that industry representatives and others are struggling with providing genuine and constructive feedback to all the HVNL Issue Papers. The Forum agreed that the NTC should approach Responsible Ministers seeking an extension of time to finalise the HVNL, and importantly for the development of the Regulatory Impact Statement (RIS). The Forum also agreed that the NTC should be encouraged to circulate options in key areas based on the responses received to indicate how the preferred outcomes might be shaped.

The NHVR strongly believes that it is critical to make the most of the review opportunity to develop a modern legislative base to enable effective regulation that encourages and adapts to the evolving needs of heavy vehicle operations in Australia. The key concepts of 1) introducing a new safety objective for fatigue risk management and 2) giving regulatory recognition to fatigue monitoring technology require further policy development and this won't be complete with the current deadlines for the review of the HVNL.

Accordingly, the NHVR suggests that a six-month delay in the Consultation Regulatory Impact Statement is needed if these concepts are to be included in the options being presented for consideration. A six-month delay would provide adequate opportunity for these concepts to be developed to sufficient maturity to allow open and transparent scrutiny for regulatory purposes.

To avoid delays to the full delivery of the HVNL review, we propose that the Regulator works with the NTC to develop a transitional plan compatible with the proposed new HVNL requirements and that the Regulator implement this plan using our current administrative powers in parallel with the legislative process, where possible, to expedite the transition to the new arrangements.

Attachment A – NHVR's responses to Issue Paper Questions

Q1: How can we change our approach to fatigue management so we reduce fatigue-related incidents and deliver Australia's road transport task efficiently and safely?

New object for fatigue risk management to improve fatigue safety

Given the concerns raised with the NHVR during the Fatigue Safety Forums, the NHVR believes that the current requirements in the HVNL do not sufficiently encourage proactive voluntary compliance for fatigue risk management.

The key factors that influence voluntary compliance are:

- the credibility of the rules in effectively managing the issue of concern
- the presence of acceptable alternatives to compliance,
- the costs and benefits of compliance in the market-place, and
- regulated entities knowledge of the suitable business practices^{1 2}.

The discussions with industry at the Fatigue Safety Forums, indicate that the current HVNL requirements negatively affect industry's perceptions on credibility, net benefit and adoption of new fatigue safety practices. Indeed, the recurrent theme in the feedback was that 'safer' operators were concerned at being disadvantaged when compared to other less safe operators in a competitive commercial environment.

The NHVR believes that a systemic improvement in fatigue safety outcomes will only be achieved when industry decides to invest in safety beneficial practices. This will occur when there is a clear, unambiguous regulatory requirement in the HVNL for heavy vehicle users to manage fatigue risks as part of the chapter for fatigue management.

The NHVR also believes that the review of the HVNL needs to address the elements within the current prescriptive requirements that inhibit proactive safety practice and that the Regulator should have capacity to recognise new and innovative fatigue safety practices made by industry, even when these practices are not previously countenanced in the prescriptive requirements in the HVNL. For example, allowing the Regulator to provide regulatory recognition of fatigue monitoring technology.

As discussed earlier in our submission, there are multiple objective measures of safety performance and culture that the Regulator can use to monitor system performance.

Using these measures, the evidence from AFM (the only fatigue risk management system currently endorsed under HVNL) is that AFM operators are safer, have a lower risk exposure and are more compliant than those operating under other work and rest arrangements.

The NHVR **recommends** that the HVNL is reviewed to:

- Adopt fatigue risk management as the primary fatigue safety object of the law

¹ Prananjaya, Kadek & , Supriyati. (2018). Voluntary compliance individual taxpayer: personality intellectual factor. *International Journal of Business Management and Economic Review*. 1. 91-100.

² Sharpiro & , Rabinowitz. (2000). Voluntary regulatory compliance in theory and practice: The case of OSHA. *Administrative Law Review*. 52. 97-155.

Q2: What fatigue risks that are currently out of scope for the HVNL should be brought into scope? What is in scope that shouldn't be?

Rising importance of sleep

Recent research is showing that the quality and quantity of sleep drivers get is emerging as the sentinel issue for determining potential fatigue impairment. Sleep is an active process where the body repairs damage done during the waking hours. Poor sleep is associated with poorer driving performance, increased emotional volatility and a range of health issues (e.g., diabetes, fertility loss, cancer, and anxiety and depression) that exacerbate driver fatigue.

Whilst, the seven principles outlined in the *NHVR's Body of Knowledge on Fatigue Management* (discussed below) uses a work and rest paradigm for managing drivers' exposure to risks associated with inadequate sleep, they are only required to be applied to Advanced Fatigue Management and work and rest hour exemptions. The prescribed maximum work and minimum rest hours in Standard Hours and Basic Fatigue Management do not address the seven principles and, accordingly, they and driver sleep are not effectively regulated by the HVNL.

The NHVR also observes that there are elements within the Heavy Vehicle National Law that hamper proactive strategies for improving driver sleep quantity and quality. Mass, dimension and loading requirements, for example, hamper the introduction of prime movers vehicles with extended sleeping cabs as, to fit within the prescribed lengths, these prime movers must be combined with shorter trailers. Despite the potential safety benefits of provided more comfortable sleeping accommodation in the vehicle, operators face a permanent productivity loss in terms of carrying capacity.

Deemed impairment and drivers' right to stop

The primary fatigue safety duty in Chapter 6 of the HVNL prohibits drivers from driving a fatigue-regulated heavy vehicle on a road while impaired by fatigue. Despite this, the primary operational focus for drivers, heavy vehicle operators and authorised officers is compliance with the prescribed maximum work and minimum rest limits. The NHVR believes that there are two factors that contribute to this outcome.

The first factor is that there currently is no standard or tool to allow drivers, heavy vehicle users or authorised officers to objectively determine when a driver is impaired by fatigue. Whilst technological solutions are being developed, one possible legal approach to overcome this would be to introduce deemed impairment provisions. These provisions use the best available science on human performance to determine an easily understood and reliable heuristic of potential impairment. For example, the current breath alcohol limit of 0.05 for most open licence holders in Australia is a deemed impairment provision for alcohol impairment.

The second factor is that there is no legal protection from repercussion for drivers, should they decide they are impaired and need to stop. Knowing that they are impaired from fatigue doesn't protect driver or the public if the driver isn't able to act on that knowledge. Heavy vehicle users face commercial pressure to make deliveries on time. The NHVR has received numerous complaints from heavy vehicle drivers saying that they felt that they could not stop, even when they thought they were no longer safe to drive, because of potential contract or employment restrictions going forward.

Employment and contract protections exist for drivers and heavy vehicle users providing assistance to the Regulator but not for the primary fatigue safety duty. The NHVR believes that the current protections in the HVNL should be extended to give drivers the right to stop when they deem themselves or are deemed to be impaired.

Q3: What are the key risk factors associated with long hours, night shifts and other work schedule factors? How do we account for the fact that not all work hours have the same risk without introducing excessive complexity?

NHVR's Body of Knowledge on fatigue management

The key factors associated with heavy vehicle driver fatigue are well known. The NHVR's approved body of knowledge on driver fatigue identifies seven key principles, outlined below.

In terms of work-related rest breaks (short breaks from driving within the driver's shift to reduce performance impairment due to extended time-on-task) the two key risks are:

- the time spent continuously working in the work opportunity, which can be countered by allowing drivers additional time for short rest opportunities; and
- the time spent continuously driving, which can be countered by taking more frequent breaks from driving, including non-driving work tasks.

In terms of allowing drivers to recover from work done on a shift, there are four risks associated with providing drivers the opportunity to obtain restorative sleep in order to reduce the likelihood of unsafe levels of fatigue in subsequent shifts. These are:

- short sleep opportunities taking drivers' biological needs and recent work histories into account, which can be countered by planning adequate sleep opportunities to allow drivers to obtain sufficient sleep; and
- sleeping during daylight hours and insufficient night sleep, which can be countered by scheduling sleep opportunities during the night; and
- stopping work between midnight and 6 am, which can be countered by avoiding scheduling shifts to end between these hours; and
- Prolonged wakefulness, which can be countered by minimising extended shifts for drivers.

In terms of giving drivers a break from work days to reduce the likelihood of drivers accumulating unsafe levels of fatigue over an extended sequence of shifts, the key risk is:

- working too many consecutive days in a row, which can be countered by resting for at least 30 hours (including two midnight to 6 am night periods).

Q4: How should a new HVNL address driver health and lifestyle factors? What kinds of controls could be effective?

Improve regular screening of heavy vehicle drivers with industry specific data

The NHVR agrees that driver health is an important contributing factor to the onset of driver fatigue. Whilst there is little peer-reviewed research evidence of a direct link between health and heavy vehicle driver fatigue in Australian driving conditions, there is evidence of such a link from available from other industries and other operating contexts.

Currently, under Fatigue Management accreditation, there are already requirements for drivers to be fit for duty (BFM/AFM) and to have a health management system (AFM). This potentially includes drivers undertaking regular medical assessments using the *Assessing Fitness to Drive 2016* guide developed by the National Transport Commission and by Austroads. The NHVR is also aware that many jurisdictions have introduced similar requirements as heavy vehicle driver licencing requirements. Anecdotally, these requirements are complied with by drivers and companies.

Accordingly, the NHVR believes that the broader regulatory environment for heavy vehicle users already contains sufficient entry controls for driver health and fitness for duty.

However, the NHVR is aware that some larger operators have begun using their safety performance data to identify health issues that occur commonly within their business and may not be covered in the current version of *Assessing Fitness to Drive 2016*. Two concerns raised with the Regulator are of specific cardiac issues and issues with the accuracy of the Epworth Sleepiness Scale used as an earlier indicator of potential sleep apnoea. The NHVR would support a further review of the *Assessing Fitness to Drive* guide to take full advantage of the heavy vehicle user specific data.

Shared responsibility for fitness to drive

Lifestyle factors originating outside of heavy vehicle operations have the potential to significantly affect drivers' fitness to drive. To ensure that such factors are considered in meeting broad occupational safety requirements, work health and safety laws in Australia create a shared responsibility between employees and employers. This shared responsibility necessitates that employees to advise employers of factors that may introduce or create a safety risk and that employers work with their employees to ensure that the risk created by drivers' lifestyle factors are controlled.

The Regulator observes whilst the HVNL provisions create positive safety duties similar in some respects to work health and safety laws, they do not provide for shared responsibility between drivers and other heavy vehicle users. The Regulator's experience is that lifestyle factors that may impact road safety are inconsistently managed because of this.

In the absence of a shared responsibility, drivers are reluctant to share information in fear of reprisals or loss of income and operators do not make themselves aware of driver lifestyle factors that may make drivers potentially unsafe for their proposed duties. This means that lifestyle factors of drivers that may increase the risk of drivers being unfit for their proposed duties or the risk of becoming impaired by fatigue are difficult to control and mitigate. The Regulator believes that the new HVNL should create a shared responsibility so that driver lifestyle factors are better controlled and managed.

Promote better proactive driver health management

The NHVR believes that a system of regular medical assessments for heavy vehicle drivers is only part of the health issue. The latest research shows that there is a strong association between the quantity and quality of sleep and a number of health issues commonly observed in drivers and other heavy vehicle users. Accepted health impacts of insufficient and poor quality sleep include:

- Sleep difficulties
- Diabetes
- Cardiac disease
- Gastrointestinal disorders
- Anxiety/Depression

- High blood pressure
- Cancer

The potential negative health impacts resulting from the sleep loss incurred by shift work fall under the remit of various Work Health and Safety Acts, which to protect the health and safety the heavy vehicle drivers. However, the NHVR believes that the review of the HVNL should investigate if the prescriptive rest requirements provide a sufficient sleep opportunity for heavy vehicle drivers to get adequate sleep. The NTC's Heavy Vehicle Driver Fatigue Research found that a seven our sleep opportunity (based on the current long rest break requirement in the HVNL) only allowed drivers five hours of sleep³. This is well below the recommendations in the American Sleep Associations Joint Consensus Statement, which calls for a minimum of seven hours of sleep for healthy adults working in normal conditions⁴.

In addition to reviewing the prescriptive rest requirements in the HVNL, the NHVR believes that industry specific education materials need to be developed on the danger of sleep loss, the risk factors common to heavy vehicle users that are associated with sleep loss and business practices that mitigate against these risks. Given the unique nature of heavy vehicle operations in Australia, the NHVR believes that these should be developed and promoted by transport regulators working in collaboration with industry stakeholders.

Q5: How do we ensure the HVNL is agile enough to adopt best practice fatigue management as it emerges? How do we encourage continuous improvement? Can training help?

Allow the NHVR to work with stakeholders to develop new standards

Just as it is not possible to design a set of work and rest arrangements to mitigate all driver fatigue risk factors for all drivers, the NHVR believes that it is not possible to design work and rest rules that can address;

- unknown risk factors identified in future research, or
- the impact of changes in market forces and operational practices, or
- emerging technologies.

This failure historically hampers continuous improvement in safety practices by creating downward pressure on safety practices as businesses with a strong safety culture are discouraged by facing higher safety costs than businesses with a poor safety culture and become economically less viable than their competitors.

To counter this downward pressure, the laws for other safety-oriented jurisdictions, have been amended to allow the regulators to develop both legal binding and voluntary standards by administrative processes. For example, Occupational Health and Safety law allows regulators to develop Codes of Practices to address new and emerging safety risks. Also, international and Australian aviation safety laws allow the regulator to develop legally rules, like CASA recently did in order to manage the emergence of drones interfering with commercial aviation operations.

These administrative safety standards allow regulators to counter the downward pressure by setting new, public safety expectations, based on the current fatigue body of knowledge and understanding of industry practices.

³ National Transport Commission. (2019). *Heavy Vehicle Driver Fatigue Research Key Findings*.

⁴ Consensus Conference Panel, Watson, N. F., Badr, M. S., Belenky, G., Bliwise, D. L., Buxton, O. M., ... Tasali, E. (2015). Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society on the Recommended Amount of Sleep for a Healthy Adult: Methodology and Discussion. *Sleep*, 38(8), 1161–1183. doi:10.5665/sleep.4886

The NHVR **recommends** that the HVNL is reviewed to:

- Introduce a rule development power to enable the regulator to develop standards for fatigue risk management, work and rest hours, record keeping and alternative means of compliance

Q6: How can we better accommodate emerging technologies? How can the new HVNL get the best value from technology and data? Do you think fatigue monitoring technology can supersede work and rest hours requirements?

Monitoring indicators of heavy vehicle driver fatigue

As discussed earlier in this submission, the NHVR is undertaking the Fatigue Monitoring Trial to assess the potential role of fatigue and distraction technologies in improving fatigue management of heavy vehicle users operating under the HVNL regulatory framework. The Trial commenced in early 2019 and is due to be completed in 2020.

The NHVR is undertaking this trial because of a lack of research evidence on the role of fatigue monitoring technology as tool for fatigue management generally, and the absence of any research evidence collected under Australian operating conditions, which typically involve travelling great distances, poor road and environmental conditions, and infrequent safe opportunities for driver to stop and take rest.

The initial data being collected suggests that there are six different categories of fatigue detection technologies and that they vary considerably. Each category has strengths and weaknesses and many of them capture factors other than driver fatigue. For example, one fatigue monitoring system frequently used in Australia also captures evidence of driver distraction. In fact, driver distraction events are reported more frequently than driver fatigue events.

It is also clear that fatigue monitoring technologies are most effective when integrated into assurance program. Whilst almost all of the technologies involve some form of in-cab warning or interaction with the driver, the data suggests that this interaction alone is not sufficient to fully counter the effects of fatigue impairment. It is common for drivers to have multiple consecutive fatigue events triggered, despite the potential intrusiveness of the in-cab warnings.

To counter this, several operators have introduced internal protocols for a responsible person within the business to immediately contact drivers with multiple events and triage the driver and provide potential options for rest and recovery to mitigate against ongoing impairment. However, the operators have developed vastly differing approaches in terms of trigger points for contact, triage method and options for resolution.

The NHVR has not completed its analysis of the timing of fatigue events detected by fatigue monitoring technology. However, preliminary analysis indicates that the majority of fatigue events occur earlier in the shift of drivers, and well before the work limits specified in the HVNL. Whilst this difference can be partially explained by the negotiating process used to agree the maximum work limits in 2008, which saw more generous limits introduced, the difference suggests that predictive value of fatigue monitoring technology is a more precise intervention than reliance on compliance with work and rest limits.

Considering the above, the NHVR believes that fatigue monitoring technology may be most suited to operate separate to work and rest hours, potentially as part of indicator of when a driver is “good-to-go” in a fatigue risk management system. One possible arrangement along these lines would be for operators to be permitted to allow drivers to manage their own work and rest up to outer limits, so long as the driver was actively monitored and not detected as having a fatigue event. This arrangement is scheduled to be included in Phase

Three of the NHVR's Fatigue Monitoring Trial. The NHVR believes that the data on the timing of fatigue events also presents an opportunity for businesses to reassess their trip planning and for Regulators to reassess the effectiveness of current work and rest limits.

Given the current lack of supporting evidence and significant variance in monitoring technology and operational practices, the NHVR believes that it is premature to include specific provisions in the HVNL at this time. However, the NHVR believes that recognition for fatigue monitoring technology is a strong candidate for introduction through a rule developed under proposed rule development rule outlined previous in this submission. This should not commence until the NHVR's Fatigue Monitoring Trial is complete and the results have been peer-reviewed and presented to relevant stakeholders.

Q7: How can the new HVNL meet the needs of all Australian states and territories? What should the new HVNL adopt from Western Australia and the Northern Territory, other transport modes and other industries' fatigue management approaches?

Seamless operations across borders

The NHVR recognizes that the different regulatory frameworks for heavy vehicle users in different states and territories of Australia, create operational inefficiencies through duplication of effort by operators working between Western Australia and the Northern Territory and participating jurisdictions.

The NHVR supports moves towards a single regulatory framework in order to remove the duplication and minimize costs for heavy vehicle users. However, such moves should not result in either a lowering of fatigue safety standards applying in any jurisdiction or create an unreasonable burden on heavy vehicle users in any jurisdiction.

The NHVR notes that *commercial vehicle operations in Western Australia are restricted to heavy vehicle users operating under the Western Australian Heavy Vehicle Accreditation (WAHVA) Scheme*. WAHVA is an entry control used by the Western Australian government to restrict or remove heavy vehicle users performing commercial operations who don't have an effective fatigue risk management scheme in place based on a mandatory audit arrangement.

Under the HVNL there already is a scheme that closely aligns with the WAHVA. AFM accreditation requires heavy vehicle operators to implement a fatigue risk management scheme and provides additional work and rest hour flexibility that is similar to the hours permitted under the Western Australian *Code of Practice – Fatigue management for commercial vehicle drivers*. The NHVR notes, however, that under AFM accreditation there are 16,384 potential work and rest hour combinations, including some outside of the parameters set in Western Australia.

The Regulator also notes that the prescriptive requirements in the HVNL allow new and developing heavy vehicle operators a way to operate as they build their capability. This is discussed further in the NHVR's response to the next question.

If a single national law cannot be achieved through the HVNL review, the HVNL needs to provide the Regulator with authority to engage with non-participating jurisdictions to develop protocols for seamless operations across borders as they relate to fatigue safety.

Q8: Are prescriptive rules desirable in a new HVNL? If so, how can we simplify rules in the HVNL to make them easier to understand so that they're easier to comply with?

Support those in industry who need prescriptive rules

In the Australian Fatigue Safety Forum, heavy vehicle users from across Australia agreed that “Caps on hours are necessary and the current work limits are acceptable in most circumstances.” It was widely also acknowledged that prescriptive rules were important for new heavy vehicle users and represented a “safe harbor” for owner-operators and smaller heavy vehicle operators (of between 1 to 5 vehicles).

These two groups of heavy vehicle operators represent about three quarters of heavy vehicle users in Australia. On this basis, the Regulator believes that there is a strong case for retention of prescriptive rules in the regulatory framework created by the HVNL.

However, participants in the forum noted that the prescriptive rules in the HVNL will not deliver better fatigue safety outcomes because:

- compliant activities can be unsafe
- non-compliant activities can be safe
- the focus of the law is too narrow, and
- the law is too complex to be applied consistently.

The NHVR believes that current prescriptive rules in the HVNL need to be systematically reviewed to ensure that:

- only safe activities are prescribed in the rules
- outdated or redundant rules are removed
- there are no internal inconsistencies or conflicts between prescribed rules, and
- the language is simplified and key elements are clearly defined.

The NHVR has completed an internal review of the current prescribe rules, given our specialist knowledge of the practical implications of the rules in heavy vehicle operations. Our proposed revisions have not been included in this submission as they are extensive and complex, but the Regulator is very willing to discuss our proposed revisions in details at a mutually convenient time.

The criticisms outlined above were attributed to age of the rules and subsequent departures from the original regulatory framework given a better understanding of factors contributing to heavy vehicle driver fatigue, changes in heavy vehicle operational practices and the introduction of the Regulator itself. One example of this are the provisions for the Electronic Work Diaries (EWDs) were developed prior to the development of the smart phone platforms and software-as-a-service platforms for individuals. Accordingly, the legislative requirements for approving EWDs specified in the HVNL are based on standalone technology in linked to a vehicle and hamper the adoption of heavy vehicle driver-based software systems.

The Regulator believes that, in order to prevent the prescriptive rules included in the new HVNL becoming obsolete, they should be relocated from the Act and Regulations into subordinated standards. As discussed earlier in this submission, these subordinated standards should be developed by the Regulator itself, as national specialist agency in terms of heavy vehicle fatigue safety risks and issues, but with open and transparent consultation with industry, government stakeholders and enforcement stakeholders.

The NHVR **recommends** that the HVNL is reviewed to:

- Relocate prescriptive standards for work and rest limits and record keeping into legally binding subordinate standards
- Revise retained provisions to correct errors and inconsistencies in law

Q9: Would the compliance options described in section 4.5 be a more effective approach to regulating fatigue management? If so, what should be included in the new HVNL, its subordinate documents, or elsewhere, such as in work health and safety laws? How would the appropriate fatigue management option be allocated to an operator – by self-selection or other means?

As discussed earlier in this submission, the NHVR believes that the primary object of Chapter 6 of the HVNL should be effective fatigue risk management. Heavy vehicle operators could demonstrate compliance with this requirement in one of three ways:

- Compliance with prescribe fatigue risk management obligations stipulated in a fatigue risk management standard created by the Regulator
- Participation in accreditation in fatigue risk management recognised or operated by the Regulator, or
- By demonstrating alternative means of compliance.

Under this arrangement, heavy vehicle operators would be free to determine which approach best suits their capability. However, the burden of proof in each option rest with the operator itself.

The NHVR is responsible for providing third line assurance in all three options, though the nature of the checking differs depending on the options taken. In the case of heavy vehicle operators complying with prescriptive fatigue risk management obligations, the NHVR would check evidence of compliance with the obligations. In the case heavy vehicle operators who are accredited in fatigue risk management the role of the regulator is to check that the accreditation processes used by the heavy vehicle operator meet the required standards.

This may be on entry, shortly after entry or at random or triggered post-accreditation audits. In the case of heavy vehicle operators proposing alternative means of compliance, the role of the Regulator is to check the proposed alternative means achieve the same outcomes as prescriptive and accreditation options at entry and to monitor performance until the Regulator is satisfied that the alternative means are achieving the desired outcomes.

Q10: Should the new HVNL give operators the option of taking full responsibility for risk management? What would be the roles of the regulator and roadside enforcement in such a system?

As stated above, the NHVR believes heavy vehicle driver fatigue safety would be improved if the HVNL introduced a new object for fatigue risk management in Chapter 6. However, this does not mean that such an action would change heavy vehicle operators' responsibility for risk management as heavy vehicle operators already have full responsibility for fatigue risk management.

In an arrangement where heavy vehicle operators have responsibility for risk management, the role of the Regulator is four-fold:

- Setting standards for fatigue safety, including standards for fatigue risk management and deemed impairment

- Promoting and educating heavy vehicle users on fatigue safety standards and practices
- Checking heavy vehicle operators fatigue risk management systems when applying for accreditation or regulatory concessions
- Monitoring safety performance, investigating safety issues and initiating improvements in fatigue safety

In terms of roadside enforcement, the role of the Regulator is to monitor driver fatigue, monitor compliance with prescribed requirements in the HVNL, and collect information and evidence of potential systemic non-compliance or poor safety management for investigations and prosecutions.

Q11: How can we get the best overall value from a compliance and enforcement strategy for fatigue management? How are scarce resources best allocated, and what tools do regulators need? What provisions in the law do operators need?

In addition to the rule development power discussed earlier in this submission, the NHVR believes that an important component of developing appropriate safety standards for heavy vehicle users is the ability to accurately understand the risk factors, changes in market forces and operational practices and emerging technologies that combine to create the opportunity to improve safety.

When it comes to understanding the business practices, there can often be difficulties in obtaining accurate information if that information would tend to incriminate drivers or the business of unlawful practices. This reticence is most common when the law is perceived to be complex and prescriptive, much like the HVNL.

The NHVR has already encountered this while investigating the potential of fatigue monitoring technologies. Several operators currently using fatigue monitoring technology have called for assurances from the Regulator that they are will not be unduly penalized for transgressions discovered during our investigations.

Whilst the normal rule of public interest, prospect of success prosecution, etc. are considered before taking legal action, a number of the safety regulators have the additional capacity to undertake no fault investigations. For example, the Queensland Department of Transport and Main Roads has no fault investigation powers for rail safety purposes.

The NHVR **recommends** that the HVNL is reviewed to:

- Introduce a power for no-fault investigations and reporting for building knowledge on the antecedents of heavy vehicle crashes caused by driver fatigue

Q12: What else would you like to tell us about effective fatigue management?

The submission above addresses the NHVR's key concerns and proposals for the review of the HVNL.

