

**ELECTRONIC SYSTEMS FOR
HEAVY VEHICLE DRIVER FATIGUE
AND SPEED COMPLIANCE**

DRAFT POLICY PAPER

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FOREWORD

The National Transport Commission (NTC) is an independent body established under Commonwealth legislation and an intergovernmental agreement, and is funded jointly by the Commonwealth, states and territories.

The NTC has an ongoing responsibility to develop, monitor, maintain and review uniform or nationally consistent regulatory and operational reforms relating to road, rail and intermodal transport. In developing reform recommendations to Transport Ministers, NTC's objective is to improve productivity, provide a safe transport system and protect the environment.

The NTC recently released a draft of the *National In-Vehicle Telematics Strategy: The Road Freight Sector*. This strategy aims to encourage the use of in-vehicle telematics, through a partnership between industry and government to support better safety, productivity and environmental outcomes. Australia's national transport reform objectives.

The *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft policy paper* acts as one policy position under this strategic direction.

The Australian transport and logistics industry is already using technology to improve its efficiency and business processes. Harnessing its potential to improve road safety compliance and reduce unnecessary red tape is a terrific opportunity.

I encourage you to make comment on this report to ensure the potential benefits identified in this report are fully realised. In particular, we are seeking comment from makers and users of in-vehicle telematics systems.

Ways to make a submission are detailed in this report with submissions due by Friday 3 October 2010. We will make any submissions received available on our website (www.ntc.gov.au). After the public submission period closes, the NTC will consider all submissions in developing the final policy proposal. The last step in the process is the submission of the final policy proposal to the Australian Transport Council for approval.

I would like to thank all those individuals and organisations involved in the consultation to date and especially those who have made written submissions. I would also like to acknowledge the work of NTC staff in developing this report, particularly Rob de Maid, Neil Wong, Tim Eaton, Chris Jones, Ray Hassall, Karen Dowling, Jeff Potter, Shaun Talko and Lisa Kazalac.



Greg Martin
Chairman

SUMMARY

In its most recent discussions on fatigue management, the Australian Transport Council (ATC) requested that the National Transport Commission ‘develop a possible regulatory framework [...] for electronic devices to monitor heavy vehicle speed and fatigue’ (ATC 2008a).

Electronic devices offer the potential to record and use information in ways not possible within the current paper-based system. For example, these devices can assist drivers to comply with the law and plan their work and rest times. This information can also be fed back to operators to assist them in responding proactively to on-road events (such as loading delays) by changing trip schedules, roster and planned rest breaks.

The current paper-based system is a key barrier to improving the voluntary uptake of electronic systems and harnessing their potential to manage fatigue and speed risks, as recommended by the draft *National In-vehicle Telematics Strategy: The Road Freight Sector* (NTC 2010a).

Many operators are operating electronic systems for commercial purposes and retaining the paper-based work diary for regulatory requirements. Being able to combine these instruments into a single system can significantly reduce unnecessary red tape – an important policy goal for all governments.

National fatigue laws already allow for the use of an electronic work diary as an alternative to the written work diary, and have established a process for approval. However, the legal requirements do not specify the level of performance the electronic devices need to meet. For example, when using a paper-based diary the driver’s signature is prescribed as the form of authentication, but there are no specifications for authenticating an electronic record.

Regulators have also been reluctant to consider applications for using electronic work diaries without further guidance on how an assessment should be undertaken. Some regulators would like an electronic work diary to eliminate the shortcomings of the paper-based diary, and therefore improve road safety compliance. Industry believe a higher standard of record keeping would simply result in the continued use of written work diaries.

Regulators and some industry stakeholders argue that a robust performance specification for in-vehicle telematics devices is needed to monitor persistent speed and fatigue offenders. Courts could then apply these requirements through a supervisory intervention order¹ if additional guidance material is developed.

This draft policy paper argues that electronic work diaries can be made available to industry by finalising the approval process, developing guidance material and making some minor legislative changes. The report also recommends an operational pilot of electronic work diaries to test the institutional and operational environment described within the guidance material.

The NTC believes the development of guidance material consistent with the current legislation will provide certainty to industry and governments about the requirements of electronic work diaries. When the NTC developed this paper, it aimed to provide the minimum requirements to meet regulatory needs without explicitly identifying a particular

¹ Supervisory intervention orders are similar to enforceable undertaking and are a serious course of action for those operators and drivers persistently breaching speed and fatigue laws.

type of technology wherever possible. The NTC believes that his approach gives industry the policy certainty they need, while still allowing the broadest scope for the uptake of this technology and minimising cost to operators. The proposed approach also allows courts to impose additional conditions such as automatic data capture, or speed monitoring which prevents recidivist drivers from dishonest recording.

This policy paper addresses other key policy issues, such as ensuring historic sanction policies for speed and fatigue laws do not unfairly penalise breaches of very low consequence. In-vehicle telematics devices can identify work or rest hours breaches of 1 second and very minor speed breaches, potentially resulting in the accumulation of many penalties over a short period of time. Given the likely safety benefit of building in-vehicle telematics monitoring into management systems, more detailed consideration of sanctions policy in an in-vehicle telematics environment is warranted.

Roadside enforcement also presents challenges when using in-vehicle technology. Road authorities and Police would need technology to view electronic records, or require the ability for electronic or paper records to be produced at the roadside. As well as the cost imposition to the overall system, this requirement has ramifications on the reliability and robustness of the solution and may affect adoption rates.

These issues are significant and are being explored by the Roads and Traffic Authority New South Wales pilot of electronic work diaries. The pilot is expected to focus on the institutional, operational and business processes required when using these technologies and provide further information on the solutions to these issues.

Feedback from consultation on this draft policy paper and the results of the pilot will inform the development of a final proposal and Regulatory Impact Statement.

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GLOSSARY OF TERMS

Term	Definition
Approving authority	The authority that grants approval for the use of a proposed type of electronic work diary system to be used in the market in accordance with section 74 of the model fatigue legislation.
Driver	The driver of a regulated heavy vehicle that uses an electronic work diary system to maintain his or her work diary.
Enforcement officer	An authorised officer or police officer – a person authorised under the model fatigue legislation or the associated compliance and enforcement regulations to access and review the records of work and rest for one or more drivers in order to assess the compliance of drivers, record keepers and/or other parties in the chain of responsibility with the legislation.
Written work diary	Written work diary or paper work diary issued by an approving authority (currently state and territory road authorities).
Electronic work diary	A system of recording information defined by the model fatigue legislation, labelled and approved by an authority.
Non-approved electronic work diary	An electronic work diary not approved by an approving authority for use to comply with fatigue or speed regulations.
Record keeper	The person responsible for maintaining records of work and rest for a driver as defined under section 62 of the model fatigue legislation and any person engaged in accordance with this section to carry out some or all of the record keeper's functions.
Work time	As noted in section 37 of the model fatigue legislation – time that the driver spends driving a regulated heavy vehicle whether or not it is on the road and any of the following: <ul style="list-style-type: none">• loading or unloading• inspecting, servicing or repairing the vehicle• inspecting or attending to the load on the vehicle• attending to the passengers of a bus• cleaning or refuelling the vehicle• performing marketing tasks in relation to the

operation of the vehicle

- helping with, or supervising, an activity mentioned in subparagraphs (i) to (vi) (of section 37)
- recording informing or completing a document.

Rest time

As noted in section 38 of the model fatigue legislation – time that is not the driver’s work time.

Circadian

Physiological activity which occurs every 24 hours.

Interoperability

The ability of a system or a product to work with other systems or products.

Digital Tachograph

A digital tachograph is the digital version of the conventional tachograph system. Tachographs record time, vehicle speed and driver identity information and are used to determine the compliance of drivers to hour of service regulations.

1. INTRODUCTION

The Commonwealth's *Heavy Vehicle Driver Fatigue National Model Legislation 2008* ('model fatigue legislation'), which was approved by the Australian Transport Council (ATC) in February 2007, allows for either electronic or paper-based recording of work and rest by drivers of regulated heavy vehicles. In preparing for implementation of this reform, the NTC began work in 2006 to develop a specification and policy for the approval of electronic work diaries by states and territories for the purpose of recording work and rest required by the legislation.

Since the introduction of the model fatigue legislation, the focus of the ATC policy request has changed a number of times, as illustrated within the timeline shown in Figure 1.

In 2007 an existing NTC project on developing a specification for an electronic work diary was re-directed at the request of Australian transport ministers. The new request was to investigate, with Austroads, the feasibility of using the European digital tachograph² as an operational in-vehicle telematics tool to manage fatigue and speed compliance. A project to pilot the technology within Australia was commenced, but it became clear in preparation for the pilot that the technology would not be appropriate to meet the compliance requirements of fatigue and speed management in Australia. As such, the focus of Australian governments returned to electronic work diaries as a primary tool.

At a November 2008 ATC meeting, transport ministers requested that NTC bring forward the development of a possible regulatory framework for heavy vehicle driver speed and fatigue (ATC 2008a). In addition, ATC requested that the NTC continue preparing a national policy framework and regulatory impact statement for heavy vehicle driver systems. This work was to address electronic systems to manage heavy vehicle driver fatigue and speed compliance. Under this directive Austroads embarked on preparing a performance-based specification for electronic work diary and heavy vehicle speed monitoring. This specification was to sit alongside the national policy framework being prepared by the NTC. The specification developed by Austroads is a working draft and is being released simultaneously with this policy paper.

Mid 2009 saw the release for public comment of a draft position paper titled *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* (NTC 2009). The responses to this paper have been taken into consideration in preparing this report and are specifically addressed in Sections 5 and 6. Complementing this report, the NTC has released a *Draft National In-vehicle Telematics Strategy: The Road Freight Sector* (NTC 2010a) and a supporting discussion paper titled *In-vehicle Telematics: Informing a National Strategy* (NTC 2010b). These documents set out a national framework for the use of in-vehicle telematics in the road freight sector. The papers aim to increase the awareness of in-vehicle telematics and policy certainty to the transport and logistics industry, allowing an informed adoption of this technology.

The ATC has, on a number of occasions, indicated that it supports the use of in-vehicle telematics to promote safety, productivity and environmental improvements in the transport and logistics industry (refer to Appendix A for ATC's vision, objectives and principles for transport).

² The digital tachograph is the digital version of the conventional tachograph system. Tachographs record time, vehicle speed and driver identity information, they are used to determine the compliance of drivers to hour of service regulations.

This policy paper deals with issues relating to the use of electronic systems to manage hours of work and rest and speed compliance for heavy vehicle drivers. The paper examines the use of electronic systems for drivers, entities within the chain of responsibility and for use by courts to manage fatigue and speed.

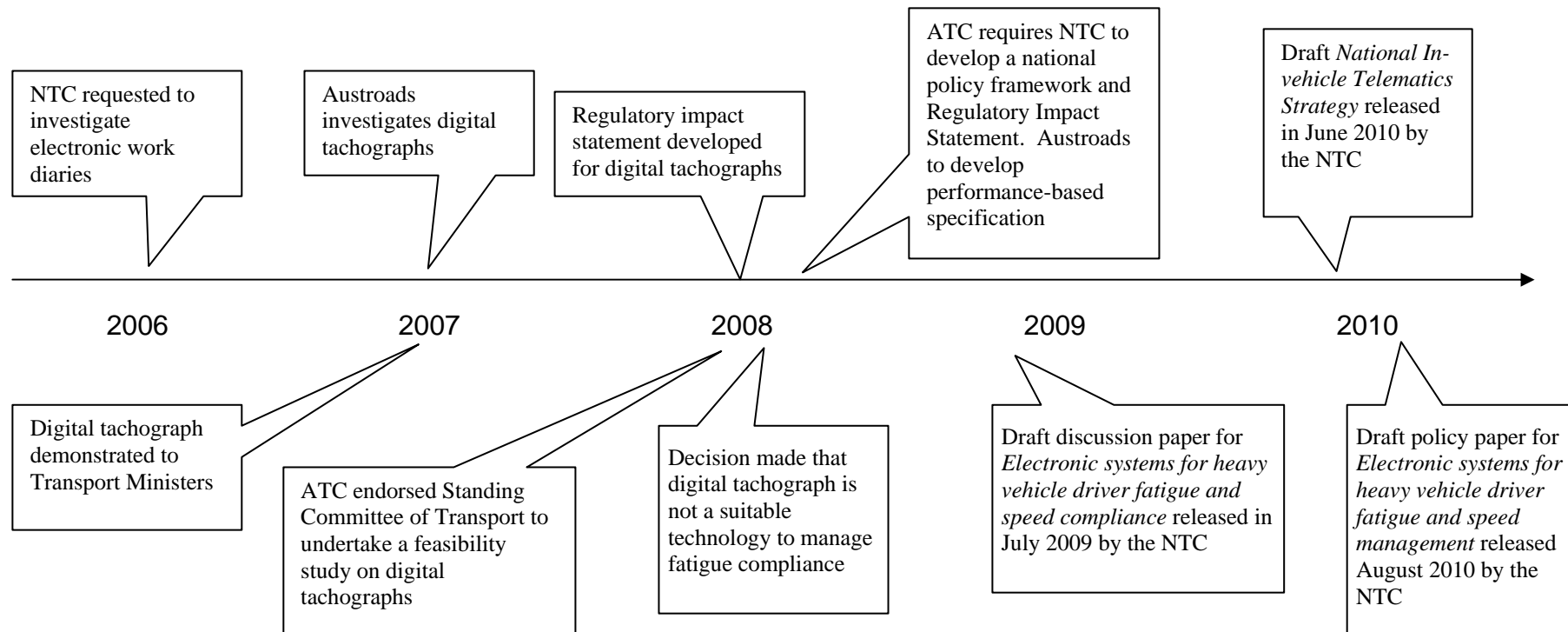
Some transport operators are using in-vehicle telematics to monitor work and rest hours and vehicle speeds. This assists them in meeting their responsibilities to manage speed and fatigue under the chain-of-responsibility obligations and for efficient fleet management. Beyond this, these systems have been used to manage staff rostering and to provide organisations with data to make strategic business decisions. Despite this, drivers are required to carry a complete written record of their work and rest, which in many cases duplicates information that their employer already captures electronically. However, before states and territories can approve the use of an electronic rather than written means of capturing this information, guidance is required as to the performance specification of systems to meet at least the regulatory requirements of the written work diary.

Drivers have a duty not to exceed speed limits, exceed maximum work limits or breach minimum rest requirements. Complementing this, entities within the chain of responsibility must take reasonable steps to prevent driver fatigue or situations that lead to drivers breaching speed limits. Finally, if the duty on the driver or obligations on the entities within the chain of responsibility fail in managing heavy vehicle driver speed or fatigue compliance, courts have sufficient tools to impose sanctions that continually monitor heavy vehicle driver fatigue and speed

Supervisory intervention orders are available for use by courts under compliance and enforcement legislation. These orders can impose monitoring via in-vehicle telematics solutions for repeat offenders to ensure transport operators or truck drivers comply with fatigue and speed legislation. However, it is difficult for courts to know which systems can ensure the monitoring is carried out with sufficient integrity such that the information is an accurate representation of the driver's actions.

A thorough analysis of the issues associated with the use of electronic systems for fatigue and speed monitoring is presented within this report. These issues are discussed and recommendations are made with the purpose to resolve the issues with a minimum level of government intervention. Feedback is sought from all stakeholders on the practical implementation of the proposed approach.

Figure 1: History of the electronic systems for heavy vehicle driver fatigue and speed compliance project



2. BACKGROUND

The development of this policy paper has been one part of the work being undertaken in relation to the application of electronic systems for managing heavy vehicle driver fatigue and speed compliance. Most recently, with the release of the *Draft National In-vehicle Telematics Strategy: The Road Freight Sector* (NTC 2010a), much interest has arisen on the role and use of these types of technologies in making the transport network and freight supply chains safer, more productive and more sustainable. In part, this interest has incorporated ways in which in-vehicle telematics may be a suitable replacement to traditional forms of record keeping such as the written work diary.

Before in-vehicle telematics can be approved as a regulatory tool, authorities must be confident that they meet the requirements of the associated legislation and produce information of evidentiary quality.

To achieve this Austroads commissioned Transport Certification Australia to undertake the development of a performance-based specification for electronic work diaries and heavy vehicle speed monitoring. In particular, the specification contains the minimum functional and technical requirements for an electronic work diary to be approved by authorities.

These specifications complement this policy paper and guidance material to provide assurance to regulatory authorities on how electronic systems can be used as an alternative to written work diary systems.

The NTC released a draft position paper *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* (NTC 2009) in July 2009 and received 13 submissions including those from transport agencies, road authorities, technology system suppliers, transport operators and industry bodies. A thorough analysis of the issues raised by stakeholders is contained in Section 5 of this report.

2.1 Background to fatigue and speed compliance legislative context

The ATC has asked the NTC to develop a policy framework and regulatory impact statement for heavy vehicle driver systems. Complementing this, Austroads has developed a performance-based specifications for electronic work diary and heavy vehicle speed monitoring. To understand how these tasks fit together and what outcomes they aim to achieve a discussion of the relevant fatigue and speed legislative environments is presented below.

2.2 Fatigue

It is widely recognised that fatigue is a serious and common contributing factor to heavy vehicle crashes in Australia and around the world (NTC 2006). In September 2008 the *Heavy Vehicle Driver Fatigue National Model Legislation 2008* (NTC 2008b) came into force in Queensland, New South Wales, Victoria and South Australia. This new fatigue reform makes parties in the supply chain legally responsible for preventing driver fatigue. The model fatigue legislation applies to trucks with a gross vehicle mass (GVM) of over 12 tonnes and buses with more than 12 seats including the driver's seat.

The model fatigue legislation is consistent with current obligations under occupational health and safety laws. This law imposes a general duty on: the employer of a heavy vehicle; the prime contractor of the driver; the operator of the heavy vehicle; the scheduler of goods or passengers for transport by the vehicle, and the scheduler of its driver; the consignor of goods for transport by the heavy vehicle; the consignee of goods for transport

by the heavy vehicle; the loading manager of goods for transport by the heavy vehicle; the loader of goods on to the heavy vehicle; and the unloader of goods from the heavy vehicle to take reasonable steps to manage driver fatigue (not merely to comply with driving hours).

The reform changes the focus from regulating work hours to managing fatigue. Long hours of work and work at circadian low points are widely recognised as high risk for fatigue-induced errors (NTC 2006). Proper management of fatigue includes planning trips and rest breaks, managing work and rest records, and training staff to understand the causes of driver fatigue.

In most developed countries, drivers of large heavy vehicles are subject to some form of regulation relating to driving or working time. These rules limit continuous driving time and may also require drivers to take minimum breaks or rest periods. This helps to reduce the risk of drivers becoming involved in fatigue-related incidents and improves road safety.

In order to monitor driver compliance with the legislation governing work and rest, most countries require drivers to make and keep records of work and/or driving. These records show what hours the driver has worked, when they have rested and what trips they have undertaken. In Australia, the model fatigue legislation requires drivers of heavy vehicles to use a work diary in the following circumstances:

- when they are engaged in work 100 km or more³ from their home base within a 28-day period
- when driving for an operator in a fatigue accreditation scheme (either basic or advanced fatigue management).⁴

The model fatigue legislation provides guidance about fatigue management to parties in the transport supply chain and increases compliance through more effective enforcement, offences, sanctions and record-keeping requirements.

To achieve the desired outcome of improving safety while enabling maximum productivity, the model fatigue legislation was developed using the following key principles:

- Encourage effective management of the key determinants of fatigue. Collecting electronic information allows for ‘real time’ information to be used to feed fatigue-management decision making.
- Address commercial actions from parties in the supply chain that increase risks of fatigue and resultant effects on road safety.
- Ensure accountability of all those with responsibility for, or control over, practices that result in unsafe outcomes. Electronic information allows effective distribution to those within the chain of responsibility.

³ These provisions are implemented through state-based legislation and may vary slightly in some states and territories.

⁴ Basic Fatigue Management (BFM) allows operators more flexible work and rest hours linked to accreditation (i.e. National Heavy Vehicle Accreditation Scheme). Advanced Fatigue Management allows operators to create their own safety management system and work hours linked to accreditation (i.e. National Heavy Vehicle Accreditation Scheme) (NTC 2008c, 2008d).

- Provide confidence to operators that they are complying. This is of greatest importance for smaller operators who are less likely to have the resources to develop complex compliance systems.
- Be flexible and applicable in the full range of circumstances in which road transport operations are undertaken and within the diverse structure of the industry.
- Do not impose excessive compliance costs on transport operators.
- Enable cost-effective enforcement.

While the core function of a work diary is for drivers to record their work and rest for compliance assessment, this information is also needed on a practical level to meet the obligations for entities within the chain of responsibility to manage driver fatigue.

The legislation allows for records of driver work and rest to be kept either in a written work diary or in an approved electronic work diary. Currently there are no electronic work diaries approved for use in Australia for regulatory purposes. However, many companies and their drivers are already using technology that electronically records information on drivers' work, driving and rest times in addition to the written work diary.

The current collection of information within the operators' commercial record keeping for other business and operational needs creates two significant issues. First, the recording of work and rest in both an electronic system and a written work diary is cumbersome and inefficient. Second, as all information recorded by the operator is discoverable, conflicts between the information contained within the commercial electronic record-keeping system that contradicts the written records of the driver could be incriminating for the driver and operator.

These issues may act as a barrier to many operators who might otherwise opt for a streamlined and efficient electronic record-keeping system.

2.3 Speed

Research shows that excessive speed is the other major contributing factor to heavy vehicle crashes in Australia and internationally (NTC 2007b). The problem of speeding in heavy vehicle road transport is characterised by a range of factors:

- Speeding is relatively common among heavy vehicles (Robbins 2010).
- Analysis shows that speeding is a significant factor in heavy vehicle crashes, and is likely to pose a greater risk to these vehicles than for lighter vehicles (NTC 2007b).
- There is a high cost to the community from deaths and injuries from heavy vehicle crashes where speeding is a factor. The NTC estimated this to be \$343 million per annum (NTC 2007b).
- Although vehicles above 12-tonne GVM are required to be limited to not more than 100 km/h, this device has no effect in reducing speeding on roads where the speed limit is below 100 km/h; instances of tampering with speed limiters are regularly reported.
- It is not unusual for heavy vehicle drivers to be put under external pressure to meet deadlines, which can influence on-road speeding.
- Speeding heavy vehicles attract higher operating and maintenance costs but also achieve a competitive advantage over operators who do not speed.
- Speeding results in higher fuel consumption and greenhouse gas emissions.

- In certain areas of Australia there are community concerns about the safety of sharing the roads with speeding heavy vehicles. This problem is likely to be compounded by the projected doubling of the freight task by 2020 (NTC 2007b, p. 13).

These factors have the potential to hold back future productivity reforms for the road transport industry unless addressed.

The issue of speeding heavy vehicles has been a concern for some time in Australia. There are many policy and legislative responses that attempt to address this problem. These responses include education, industry initiatives and enforcement (e.g. the use of speed cameras, radar devices, point-to-point cameras). The 'safe systems' approach to road safety, as set out in the *Australian National Road Safety Strategy Action Plan 2009–2010* (ATC 2008b), recognises that drivers will make errors and that roads, vehicles and travel speeds should accommodate the consequences of human error. As a result, the system should be designed and managed to reduce the risk of crashes, and to prevent serious injury or death if a crash does occur.

In 2007 the ATC approved the Commonwealth's *Model Act on Heavy Vehicle Speeding Compliance Regulations 2008* (NTC 2008e). This national regulation introduced general and specific duties for transport parties for speed. These duties are for transport parties to take reasonable steps to ensure their activities do not cause the driver to exceed speed limits.

The issue of speed management presents quite differently to that of fatigue. That is, fatigue management is done through a number of tools. First, through the model fatigue legislation, this requires the driver not only to abide by work and rest limits, but to record their work and rest within a work diary. This work diary acts as a record for interested parties to review the driver's compliance and implement corrective actions to modify noncompliant behaviour. Second, through chain-of-responsibility legislation that explicitly requires entities to take reasonable steps to manage driver fatigue. This, combined with the driver recording requirements, removes the ability for entities to claim that they 'do not know' what the driver has worked.

Speed on the other hand is only captured in the chain-of-responsibility requirements. The model Act on heavy vehicle speeding compliance does not require records to be collected, or for electronic equipment to be used in that collection. As there are no current record-keeping requirements of the driver in relation to speed, speed management is difficult for off-road parties. Unless a noncompliant driver is detected by on-road enforcement or automatic detection devices, offences cannot be prosecuted.

2.4 Supervisory intervention orders

There are a number of sanctions available that can be used by courts to manage persistent and systematic offenders (both transport operators and truck drivers) under compliance and enforcement legislation. Figure 2 demonstrates the hierarchy of sanctions available to courts (NTC 2004). Within this hierarchy, supervisory intervention orders (SIOs) may make use of an in-vehicle telematics speed or fatigue-management system. SIOs are similar to enforceable undertakings and are a serious course of action for those operators and drivers persistently breaching speed and fatigue laws. However, without a recognised standard of device to impose upon an operator or driver, the effectiveness of this sanction is uncertain.

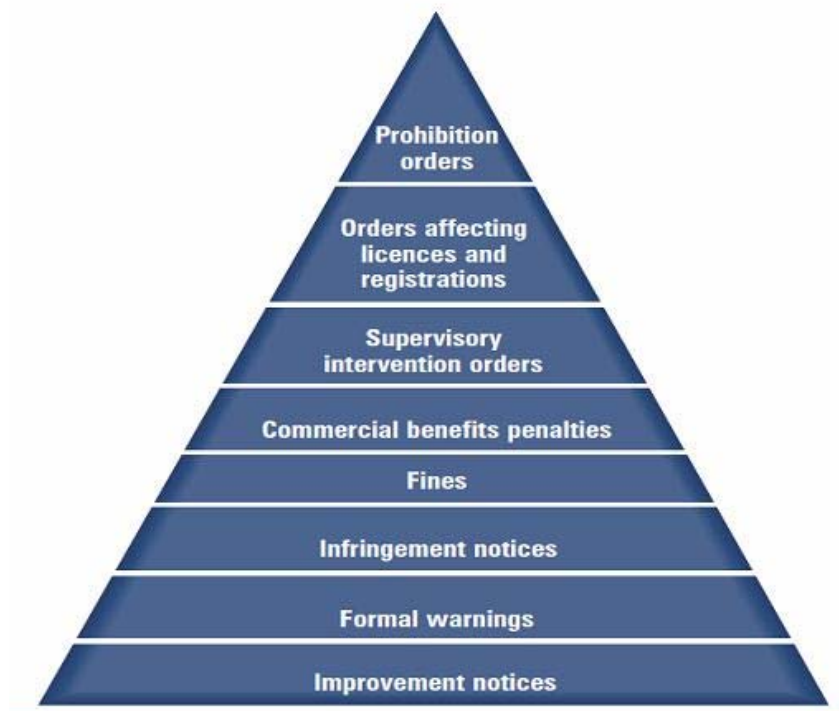


Figure 2: The hierarchy of sanctions under the national Compliance and Enforcement Bill

2.5 Scope of this policy paper

The scope of this policy paper is limited to the immediate issues associated with enabling an electronic alternative to the written work diary and determining the appropriate policy recommendations for speed management. This paper does not intend to review the existing written work diary nor its operational environment.

This paper reflects the position of the model fatigue legislation allowing for an electronic work diary as an alternative to the written work diary. That is, at a minimum any electronic work diary must be able to collect the same information, and provide at least the same security, protection, useability and durability as the written work diary. For example, the information contained within an electronic work diary must be able to follow the driver across vehicles and transport operators.

It is important to note there are new possibilities that the electronic work diary presents that the existing written work diary cannot perform (e.g. assisting drivers with information for declarations of work and rest). There are also instances where the electronic work diary will not be able to easily replicate what the written work diary does. For example, a written work diary is always operational and never 'breaks down'. However, a written work diary cannot provide records to an operator or entities within the chain of responsibility in real time, or alert operators or drivers of impending breaches of the work and rest regulations.

Consideration needs to be given to the different audiences for which the electronic work diary will be used. The electronic work diary can be used by transport operators, truck drivers, regulators and enforcement officers to name a few. The operational needs of these stakeholders needs to be carefully considered if electronic work diaries are to reflect the existing written work diary and be used as a tool to manage fatigue or speed compliance.

3. SPEED AND FATIGUE MONITORING: A CASE FOR ACTION

The current legislative environment under section 74(4) of the model fatigue legislation states:

In approving a type of electronic work diary, the Authority must have regard to any guidelines in relation to electronic diaries approved by the Australian Transport Council by notice published in the Commonwealth Government Gazette.

At this stage there are no guidelines available to assist authorities in approving electronic work diaries for use in meeting fatigue and speed compliance requirements. This section provides a discussion of the identified problems and presents the case for guidance material. Section 4 identifies the issues associated with the approval of electronic work diaries and Section 5 provides a summary of the feedback to the previous NTC position paper for this topic. Section 6 provides the policy options to allow electronic work diaries to be used and discusses the relationship between the policy, guidelines and performance-based specifications, which are all required in order for these electronic systems to be approved.

In conjunction with fatigue, some states and territories have asserted there is little advice regarding the use of fatigue and speed-management systems available to prosecutors or courts. Sections 4, 5 and 6 explore the issues, feedback and policy options to the lack of advice on available tools for fatigue and speed management for use as court-imposed sanctions.

3.1 What is needed to allow electronic work diaries and speed monitoring to be used?

Two problems were identified in the *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* released by the NTC in July 2009:

Problem 1: While the regulations for the use of electronic work diaries currently exist, approvals are being impeded by the absence of agreed national processes or guidance for their use in managing compliance.

Problem 2: There is an absence of guidance material on the available tools that may be imposed by courts for fatigue and speed compliance. This lack of guidance material limits the effectiveness of supervisory intervention orders as a sanctioning mechanism.

While the speed chain-of-responsibility legislation does not contain record-keeping obligations, it does require the entities within the chain to take reasonable steps to manage a driver's speed compliance. Unlike the written work diary, entities within the chain have had little at their disposal to actively manage the driver's speed until they have been caught by roadside enforcement.

There is a need for guidance material to be developed to provide minimum specifications and procedures to allow for the approval of electronic work diaries to be used for compliance purposes. Companies are already using electronic systems for a variety of reasons, including monitoring drivers' driving time for commercial purposes. The current model fatigue legislation provides for the use of electronic work diaries, but there have not been any approvals issued for their use. A consequence of the absence of guidance material is that industry is not using technology to its fullest capabilities. The potential benefits of such technologies are widely acknowledged and are the key driver to the recently released *Draft National In-vehicle Telematics Strategy: The Road Freight Sector* (NTC 2010a).

There are two key issues that must be considered when developing guidance material:

- guidance material that permits applications for approval of electronic work diaries by companies that only operate trucks in one state or territory (for example, material which describes the specific requirements of one states roadside enforcement officers to review electronic work diary records)
- guidance material that permits applications for approval of electronic work diaries by companies that operate trucks in more than one state or territory (for example, material which describes the requirements for multiple states roadside enforcement officers to review electronic work diary records).

This paper focuses primarily on dealing with applications for multi-state/territory approvals and makes the assumption that procedures for resolving such applications should be applicable to single state/territory approvals.

The fatigue model legislation provides powers for a road or transport regulator ('the authority') to approve the use of an electronic work diary. If the electronic work diary is for use in multiple states and territories and is approved, the agency needs to notify the agencies in other states and territories of its decision.⁵

3.2 Why is guidance material needed?

Guidance material is needed to ensure that decision making by regulators is informed by knowledge of the technical requirements that a device must meet in order to satisfactorily fulfil the function of regulatory record keeping. Understandably, regulators are reluctant to approve the use of electronic work diaries without the necessary guidance material as stipulated in section 74(4) of the model fatigue legislation.

Guidance material also has an important role to play in ensuring consistency between jurisdictions when approving applications and providing potential designers, providers and users of electronic work diaries with certainty - they can understand the requirements for their device to be acceptable as an alternative to the written work diary.

Without adequate guidance material, there are likely to be delays in the approval process and a range of issues will arise:

- industry will experience an unnecessary cost burden from operating electronic systems for business purposes but continuing to use written work diaries for fatigue regulatory compliance purposes
- the potential for conflicting information being recorded in two separate recording systems requiring operators to audit and rectify the conflict
- it acts as a barrier to innovation and safety improvements by restricting the use of advanced systems to manage driver fatigue
- potential costs for government and industry of continuing to rely exclusively on current enforcement practices.

The absence of guidance material for the approval process has existed since 1999. The problem is likely to be of growing significance, as electronic systems and devices in vehicles and transport operations are becoming much more common.

⁵ Refer to section 116 and 118 in the heavy vehicle driver fatigue national model legislation (NTC 2008d)

One way to estimate the significance of the problem is to quantify how many drivers and operators would seek to use this option. The NTC, therefore, is seeking input from industry about the likely numbers of drivers and transport operators that would consider using electronic work diaries.

The NTC is also seeking stakeholders' views about the significance of the problem. These might be broader views. For example, one stakeholder has advised that the problem is significant because it undermines the credibility of the regulatory framework by legislating a non-functioning system.

Consultation

The NTC welcomes feedback on the likely numbers of drivers and operators that would consider using electronic work diaries.

4. ISSUES

A number of issues arise when shifting from a regulatory paper record-keeping environment to a regulatory electronic record-keeping environment and introducing a speed-management system based on continuous monitoring. These issues can be broadly described as issues concerning either the 'system integrity' of an electronic work diary, 'users' of the electronic work diary and 'speed management'.

4.1 System integrity of an electronic work diary

The model fatigue legislation has minimum record entry requirements for work diaries. This includes the recording of: driver identity; work time (driving and non-driving); rest-time information; and details of any and all work and rest changes.

The electronic environment has the potential to provide many advantages to its users. Most people have contact with some form of electronic device that allows details to be recorded, erased or altered. This ability provides a significant advantage to the computer users because mistakes can be easily corrected and other alterations made without the need for starting again.

This simple yet important functionality is not possible within the paper environment and highlights one of the greatest challenges in determining the requirements of an electronic work diary. The ease of changing or erasing records without detection almost appears contrary to the core requirement of a regulatory record-keeping system and is at the heart of the issues discussed in this section. In addition to this challenge, moving to an electronic diary environment presents another issue for recording of non-driving work hours. Presently, under fatigue chain-of-responsibility requirements all non-driving work hours need to be entered by the driver. Under an electronic system this information still needs to be captured. To do this, drivers would have to manually enter the non-driving component of their work hours and cannot solely rely upon the in-vehicle equipment to make declarations of work and rest. Whilst creating a complexity of the system, it does ensure the driver maintains their personal declaration for all records.

4.1.1 Entry of data

Work diaries require the recording of driver identity, work–rest option information (e.g. standard, basic fatigue management or advanced fatigue management) and the details of work and rest changes (particularly relating to time and location of any change).

The model fatigue legislation requires that declarations of work and rest are performed by the driver.

In a written work diary all declarations (entries in the diary) must be physically entered by the driver. It is not possible to be assisted in the entry time, location or odometer readings within driver declarations. Drivers are required to enter the following information in their work diaries to ensure their compliance:

- full name
- licence number
- state or territory where the licence was issued
- date
- day of the week
- solo or two-up driver
- work/rest option driver is working under
- the odometer reading
- the location where the driver started work, had a work/rest break and when the driver stopped work
- the number plate of the vehicle
- the time spent working solo or two-up
- the signature(s) of the driver(s).

In an electronic environment it is possible and potentially advantageous for the electronic record-keeping device itself to provide the information necessary for the declaration. For example, a global positioning system (GPS) receiver can automatically provide location or time information. However, if a device makes a declaration without the driver's input then it may be argued that the device, rather than the driver, has made the declaration.

At a minimum, and in keeping with the essence of the written work diary and the model fatigue legislation, a driver is required to enter all the information. This ensures the driver makes the declaration because the responsibility of any information recorded within the work diary lies solely with the driver.

Pre-loading information or automatic data capture may be a time and labour-saving benefit of an electronic work diary; however, it is important that any errors from the pre-population can be corrected by the driver.

The automatic capture of information can only increase the accuracy of work and rest declarations for work involving the driving of a vehicle. Automatically captured information about the vehicle's travel allows reviewers of this information to use an independent measure to corroborate the work and rest changes. For example, a reviewer may check that the declarations of work, rest and back to work occur at the same location, or that rest did not occur while the vehicle was 'moving'.

Work within the model fatigue legislation includes the time that the driver spends in doing tasks that are related to the operation of the vehicle. This can include tasks such as loading and unloading vehicles or paperwork associated with the operation of the vehicle.

Automatically populated data for non-driving work cannot be used to corroborate the driver's work or rest breaks and as such the accuracy of non-driving work declarations would still rely upon the driver's honesty.

To meet this objective and still permit the advantages of using electronic sensors to provide relevant information, the electronic work diary can present the information for acceptance by the driver. For example, if the electronic work diary determines that the driver is at the first rest stop south of Tarcutta at 12:03 pm, this information would be presented to the driver. The information would not constitute the driver's declaration until they accept the information (this may be done by a press of a button or similar). In this case, the electronic device is not making the declaration but rather assisting the driver by providing information ready for their acceptance.

The electronic assistance provided to the driver in making declarations can have several advantages, but all times it is important that the minimum requirements set out by the model fatigue legislation are being met.

The automatic pre-population of information ready for driver acceptance may be considered as a time and administrative saving. That is, instead of the driver having to enter the time and location, the driver simply accepts the information provided automatically by their electronic work diary as part of their declaration.

Electronic assistance when making a driver declaration could be considered as increasing the accuracy (and therefore integrity) of the information recorded. Unlike the written work diary, electronic work diaries that contain the automatic generation of information for driver acceptance as part of their declarations provides an independent and real-time recording of when and where the work and rest change occurred. This independent measure provides assurance that a driver has not incorrectly recorded their work and rest times and has the potential to increase confidence in the quality of the recorded data.

This may not be the case with the written work diary because the time and location entered by the driver may be accidentally or deliberately inaccurate. However, it can also be argued that the automatic entry of data as part of a driver's declaration does not assure the quality of the data completely.

To capture the location and time of the vehicle would require the necessary electronic sensors (e.g. GPS). While this technology has become widely used and is relatively cheap, it may come at an incremental cost to some operators' systems and is not required by the model fatigue legislation. That is, although it confers benefits in both accuracy and ease of use, it goes beyond the minimum requirement for record keeping set out in the model legislation.

Last, the model fatigue legislation allows drivers to enter in previous work and rest declarations immediately after the driver becomes aware that they are about to undertake over 100 km work. In these instances the driver will need the ability to backdate work and rest declarations and manually enter in the appropriate information. Similar to declaring non-driving work, the accuracy of data entered for prior work would rely upon the driver manually entering this information.

4.1.2 Driver identification and authentication

Identification is the process of determining the identity of an entity; for example, the process of asking a driver their name is a process of driver identification.

Authentication is the process of verifying that someone is who they claim to be. For example, checking the name the driver has provided against their drivers' licence is a form of driver authentication.

The model fatigue legislation defines that a driver is to be identified by their name and licence details within a work diary.

For the written work diary, the model fatigue legislation prescribes the driver's signature as the authentication mechanism. Before being issued with a written work diary, the driver is required to fill out their personal details and sign the front of the work diary. At the end of each work day, the driver must sign the daily sheet. The signature on the daily sheet may be compared with the signature at the front of the diary and on the driver's licence allowing enforcement officers to verify that the person issued with the diary, filling out the daily sheet and driving the vehicle are the same person.

However, the legislation does not specify the form of electronic authentication required within an electronic work diary.

Since the work diary records the driver's declarations of their work and rest changes, it is critical that the driver enters their details into their diary and nobody else's. It is important then that in the electronic environment a driver's identity may be authenticated.

Electronic authentication can take many different forms. Having to key in a personal identification number is a common method used to ensure the correct person is entering the information. For example, a door lock may have a keypad and will only open when the correct combination of numbers is entered. On their own, personal identification numbers are not a particularly strong form of authentication because they may be stolen or susceptible to a persistent attack (i.e. a 'brute force' attack where the attacker enters in all possible combinations of the personal identification number until the correct number is discovered). Stronger forms of electronic identification utilise a combination of measures to verify the identity of the user and may involve the possession of an item (e.g. a key fob) or information unique to the user (e.g. biometric information).

While it is possible to use many different techniques to authenticate the driver's identity, it will be important that the technique provides at least the same assurance of the driver's identity as the signature within the written work diary.

4.1.3 Data integrity

For many stakeholders the motivation for shifting from a written work diary to an electronic work diary is the perception that the electronic work diary will ensure a higher level of data integrity than the written work diary.

This view has been expressed by not only government but also by operators who have to rely on information within the written work diary to meet chain-of-responsibility obligations.

As mentioned earlier in Section 4, the inherent ability to alter and erase electronic information without detection is a significant challenge in the electronic environment.

The integrity of the data recorded within a work diary relies upon accurate capture of the information (discussed in Section 4.1.1) and the protection of the information after it has been captured.

The written work diary has minimal controls regarding the accuracy of information recorded. For example, there is little in the written work diary to indicate if the driver has correctly declared the time of a work change. However, once the driver declaration is captured, the written work diary contains a number of controls to prevent information being changed or altered.

The written work diary consists of paper and therefore is familiar to all users. This familiarity not only allows users to know how to record declarations but also how to check if entries have been altered.

Each paper page of the written work diary consists of a primary white sheet and two carbonless copy sheets: one yellow and one pink. By incorporating three sheets within each page of the work diary, any recorded information is instantly duplicated on two other sheets with different-coloured backgrounds. To covertly alter declarations, a driver would need to identically erase the information across all sheets and re-enter the information.

The written work diary protects information by not preventing alteration, but rather making alteration difficult without being evident. Defacing or changing an entry in a work record (written or electronic) is an offence within the model fatigue legislation.

The written work diary is also a single-use instrument that is always operational. Unless the diary or pen is not physically present, it is impossible to argue that the written work diary is not operational or has inadvertently corrupted the driver's declarations.

By definition, the electronic work diary records a driver's declarations in an electronic format. In light of the controls within the written work diary, electronic work diary designers will be required to determine how records entered by the driver are either protected from or evident of alteration.

Electronic work diary designers will also be required to determine how the electronic work diary remains operational and, as required by the model fatigue legislation, how the electronic work diary reports to the driver that the system is or is not functioning correctly. This, unlike a written work diary, may need to consider the ever-changing electronic threats present within the electronic environment.

4.1.4 Electronic threats

As mentioned in the previous section, the written work diary may be considered as always being operational. The written work diary's simplicity results in its robustness and reliability.

In comparison, the electronic work diary is more complex and contains a greater opportunity for failure. As with any electronic device, it is susceptible to component failure, software 'bugs' and depending on its internet connectivity, may be open to viruses or other electronic threats.

It is envisaged that most electronic work diaries will utilise hardware that is common to other applications. For example, a single in-vehicle electronic device might be used as an electronic work diary, an Intelligent Access Program In-Vehicle Unit (telematics unit within the vehicle) and a personal navigation device. In this environment, the hardware and software of the electronic device is shared among applications, increasing the complexity of the environment housing the electronic work diary.

In the case of evolving electronic threats, such as computer viruses, the electronic protection contained within the electronic work diary must also evolve. This concept is not new and would be familiar to many personal computer users. Computer users often receive notices of software updates released through the internet (e.g. by Microsoft) or by the

supplier of their internet security software. These companies continually monitor the performance of their software and, if appropriate, release a new version.

4.1.5 Approval of electronic work diaries

The model fatigue legislation places the responsibility of approving an electronic work diary with the authority that has received the application. The authority must ensure that the electronic work diary meets the legislative requirements as well as any guideline in relation to electronic work diaries approved by the ATC.

To ensure consistency of the approval process and to share information on system approvals, the NTC are proposing to amend the Fatigue Authorities Panel's business rules such that if the authority's decision of approval affects another authority, the authority making the decision must inform the Fatigue Authorities Panel of the decision and any authority that the decision impacts.

Work is currently underway to achieve the COAG request for a national heavy vehicle regulator to be established by 1 January 2013. It is envisaged that this regulator will be the sole authority for vehicles over 4.5 t and will be responsible for the approval of electronic work diaries.

This change to the business rules would allow the Authority (be it state based or the national heavy vehicle regulator) to take on advice from the Fatigue Authorities Panel. It is expected that neither the Authority nor Fatigue Authorities Panel will have the technical knowledge or resources to assess an electronic work diary application and therefore will either take on technical advice from a certification body or testing institution that the device in question meets the minimum requirements for approval. It is also possible that an Authority may delegate its powers of approval to another body that does possess the necessary technical skills.

The model fatigue legislation requires that any variation of an electronic work diary is approved by an approving authority. It is expected that many of the electronic devices supporting an electronic work diary will house other regulatory or commercial telematics applications. Any variation to either the electronic work diary, hardware of the device or software environment shall require notification to and approval from an authority. Authorities will need to consider the administrative impact of this as it is expected that the number of approvals and re-approvals required will be significant.

The technical assessment of an electronic work diary is not expected to be a simple task. As required by the ATC, the specification for an electronic work diary is to be performance-based.

A performance-based specification aims to define the desired outcomes and minimise the detail of how to achieve the outcomes. This technique allows designers to develop innovative solutions that may evolve over time without being restricted by the specification.

While performance-based specifications allow for flexibility of the solutions presented by industry, this flexibility increases the complexity of the assessment task. Appropriate testing regimes must be designed and potentially re-designed for each application received. In contrast, prescriptive specifications that define how solutions shall be designed restrict industry innovation but allow for a simple 'one size fits all' testing regime.

4.2 Users of the electronic work diary

A significant challenge in shifting to an electronic environment suitable for a work diary is the many different users of the electronic work diary. The electronic work diary is used by a driver to record declarations of work and rest. The electronic records are to be provided to a record keeper. Depending on how the driver is engaged, the record keeper may change over time.

Driver declarations may be reviewed by multiple enforcement agencies (police or authorised road officers) across multiple states.

The declarations may also need to be viewed by entities within the chain of responsibility as defined in the model fatigue legislation. These include, for example, the operator, loader, consignor and scheduler. If a driver works for multiple operators then the list of people required to use the information grows significantly.

The ability for these entities to view and use the data is at the heart of many of the issues discussed within this section.

4.2.1 Information for multiple entities

The written work diary allows for information to be used by many entities by maintaining a standard format and form, and prescribing the way in which data is entered. In simplistic terms, drivers know what and how declarations should be recorded, enforcement officers know how to read the diary and look for breaches with the relevant regulations and entities within the chain of responsibility know the important information to review to fulfil their responsibilities.

In a similar manner, consideration will need to be given to how the information within the electronic work diary can be readily used by many entities. One of the simplest approaches will be to prescribe and standardise the format in which the information required by the model fatigue legislation is stored and provided.

While this level of prescription prevents designers from altering the way information is stored, it allows all users to design tools to view, interrogate and take information as required. It should be noted that this technique is common within the information communication and technology (ICT) sector. For example, the information on a mobile phone's Subscriber Identity Module card (SIM card) is stored in a prescribed standard format such that it may work with any modern mobile phone.

4.2.2 Information at the roadside

The model fatigue legislation requires an electronic work diary to be capable of reproducing information that is readily accessible, able to be understood and can be used as evidence at the roadside by enforcement officers.

Roadside inspection is performed by both the road traffic authority authorised personnel and the police. Dependent on the route of the driver and state the driver is working within, inspection frequency may vary considerably. Most operators agree that roadside inspection is relatively infrequent.

While inspection is relatively infrequent, the ability to be pulled over and inspected by any police officer or authorised road traffic authority personnel provides a driver with the deterrence to being noncompliant.

This deterrence stems from the driver's belief that there is an unpredictable and uncontrollable risk of detection and this combined with the consequences of being detected are greater than the benefit from being noncompliant.

The perception of how great the risk of detection is by a driver is controlled somewhat by the presence of enforcement officers on the roads. It is widely recognised that not all police officers are experts at reviewing driver work diaries. However, it is impossible for a driver to recognise which officers are skilled and which are not. Thus, to a driver, the risk is informed not by how many officers do conduct a detailed compliance check, but rather how many can. To maintain a continued deterrence to noncompliance, it is important to maintain the ability for all enforcement officers to be able to check work diaries.

The legislation has deliberately made reference to the availability of information at the roadside to enable the continued detection and deterrence of noncompliance.

While the terms within the legislation are subjective, it may be argued that due to the number of different enforcement agencies (at least two in each jurisdiction), this will necessitate not only a standardised format but also a medium in which agencies are able to capture the information.

The form of electronic information at the roadside presents a significant challenge.

Ideally, the electronic records stored within the electronic work diary could easily be provided to an enforcement officer. This requires the enforcement officer to have the necessary electronic equipment (i.e. computer, laptop or personal digital assistant) to view the electronic records and a direct or wireless connection to the in-vehicle equipment or for the records to be provided on a storage medium. In consultation with enforcement agencies, it is evident that while agencies are providing officers with greater levels of technology, not all officers currently have access to equipment suitable to view electronic records.

Alternatively, equipment within the driver's vehicle could be prescribed to provide the information within a standardised form that does not require the enforcement officer to have any specific technology. For example, electronic work diaries could be required to contain a standardised screen or printers where driver declarations are printed out for the enforcement officer.

In shifting to an electronic environment, the ability for information to be available at the roadside is likely to bear a cost imposition to either the operator or the enforcement agency. In the case where only electronic records are provided to the roadside enforcement officer, the cost of equipment to view the records is borne by the enforcement agency. It may be argued that the review of electronic records would be faster because this may be completed by processing software, which would offset, to some degree, the level of investment required. In the case of providing a printing facility in the heavy vehicle, the cost is borne by the operator. The operator is unlikely to achieve any productivity gain by providing a printout at the roadside because the review of the paper records is likely to take the same time as reviewing the written work diary.

It should be noted that a printing facility is likely to increase the level of complexity and cost of the electronic work diary solution and is not commonplace with current telematics equipment.

4.2.3 Evidence

A core regulatory requirement of the work diary is to provide information that may be used as evidence. Section 76C of the model fatigue legislation states a document produced by an

electronic work diary is evidence in the matters contained within the document. This statement can be a little misleading because some confuse the admissibility of a document with the integrity of the information contained within the document. This legislative requirement has been introduced to ensure that the evidence is admissible but makes no obligation on the court to believe the contents of the document.

In contrast, while information can be admitted as evidence, its ability to support or defend an allegation may be challenged. The credibility of the information contained within the document may then come down to the standard or specification used by the approving authorities to approve the system, the operational state of the system and how it was operated to generate the documented information.

Current commercial electronic record-keeping systems purport to be capable of meeting the legislated recording requirements of an electronic work diary. However, as commercial systems are not currently recognised as electronic work diaries, they may not be designed specifically to maximise the ability for their generated information to be considered credible evidence.

HB 171 – 2003 Guidelines for management of IT evidence (SAI 2003) is a document designed by the Australian Government to provide insight into the management of electronic records to maximise their ability to be used as credible evidence within a court proceeding. This document provides guidance on Information Communication Technology industry best practices to the creation, storage and protection of information such that negative assertions on the integrity of the data cannot be substantiated.

Electronic work diary designers will need to design their systems in accordance with the principles discussed within the *Guidelines for management of IT evidence*.

4.2.4 Portability of records

The written work diary has a significant advantage of being portable. This allows a driver to transfer the written work diary between vehicles or operators regardless of the equipment installed at any particular location. This must also be a function of the electronic work diary.

However, many existing commercial electronic record-keeping systems utilise equipment that is tethered either electrically or physically to the vehicle making it impractical to move the installed equipment.

As discussed in Section 6.3.7, an electronic work diary is a system for recording driver information as required by the model fatigue legislation. This system could be compared to the driver's pen in the written work diary environment. Further, the records recorded by an electronic work diary may be considered to be comparable to the pen recordings within a written work diary.

Like the written work diary, the critical component for the driver is not which pen they use to fill out the diary, but rather the records within the diary itself. The same may be said for an electronic work diary. As long as the recording equipment is capable, it does not matter which recording equipment is used to record the drivers' declarations of work and rest.

As such, an alternative approach to making the complete diary portable is to make the drivers' records portable across vehicles and systems. For example, many personal computer users store files on memory sticks or CDs. The file can be easily transferred between computers.

While this technique is common within the ICT industry, it would require another level of prescription. That is, the format and medium that the electronic records are stored within

would need to be prescribed to ensure all approved systems were capable of reading from and writing to the same medium.

4.2.5 Counting time

The model fatigue legislation prescribes that a period of work shall be rounded up to the nearest 15-minute increment while a period of rest shall be rounded down to the nearest 15-minute decrement. This provision has been designed to simplify the recording requirements on drivers and to ease the compliance and assessment task of enforcement officers.

This provision creates a bias to safety by slightly overstating time at work and understating rest time.

For example, if a driver starts work at 7 am and drives for three blocks of two hours and one minute, resting 15 minutes between driving blocks, the time on the driver's watch will be 1:33 pm (i.e. 7 am + 2 hrs 1 min + 15 min + 2 hrs 1 min + 15 mins + 2 hrs 1 min = 1:33 pm).

However, examining the driver's written work diary would suggest the time is actually 2:15 pm (i.e. 7 am + 2 hrs 15 mins + 15 mins + 2 hrs 15mins = 2:45 pm) as shown in Figure 3.

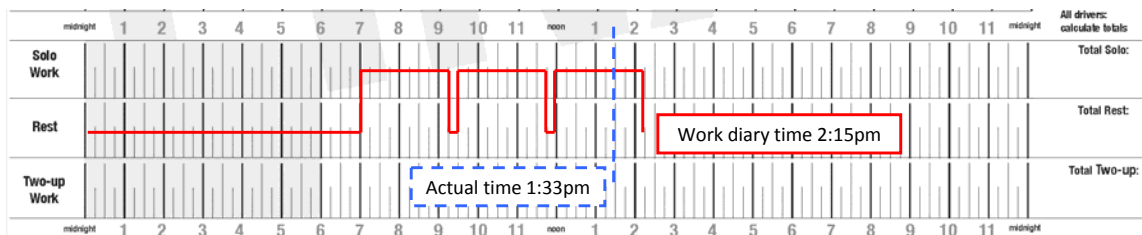


Figure 3: Counting time

Figure 3 shows that the driver cannot record accurate information if abiding by the counting rules within the model fatigue legislation. Practically, many drivers would not follow the legislative requirement to round the two hours and one minute driving blocks to two hours and 15 minutes, meaning the declarations in their work diary, while illegal, would show the time as 1:30 pm (much closer to reality).

This scenario creates a significant challenge for the electronic work diary. It is expected that many systems may automatically pre-populate information within a driver's declaration in readiness for the driver to accept the declaration as their own. However, designers of the electronic work diary, to meet the legislative requirements, would need to follow the prescribed counting rules, creating an inaccurate recording system.

Alternatively, the counting time rules within the legislation may be modified to allow electronic work diaries to count time accurately. While this addresses the issue of the counted cumulative work and rest matching reality, it creates a significant difference to the written work diary and may need to be considered further from an equity perspective.

4.2.6 Compliance

The alternative counting time rules described within Section 4.2.5 create an alternative problem for the determination of driver compliance.

Under the current counting time rules, drivers cannot record information in any time period smaller than 15-minute blocks. This means that the smallest breach of a driving regulation is 15 minutes. Further, as many drivers using a written work diary will not always round up work time and round down rest time, their exposure to breach detection is significantly reduced.

Accurate driver recording allows much smaller breaches of the limits of work and rest prescribed within the model fatigue legislation as compared with the written work diary. For example, a driver may drive for five hours and 16 minutes before being able to take a rest. This driver, under the standard hours' provisions of the legislation has breached the allowable work limit by one minute. Under the current sanctions within the heavy vehicle driver fatigue national model legislation, this driver may be treated the same as a driver who has breached the regulated work time by 15 minutes.

Given that the sanction policy within the model fatigue legislation has been framed around 15-minute breaches, it appears to be unreasonable that breaches of one minute be enforced. Enforcement officers are able to apply their discretion when determining the appropriate action following non-compliance detection. This is similar to the discretion applied to speed compliance and assessment with passenger vehicles.

Further, the model fatigue legislation allows drivers, as a defence, to annotate if insufficient or unsafe rest areas were available at the time of the required rest break. While this will be assessed and again relies on the discretion of the enforcement officer, it would be difficult to believe a driver with a legitimate defence would be sanctioned for an insignificant breach. This allowance has not been adopted by all participating jurisdictions. However, this jurisdictional inequality is expected to be resolved by the introduction of the National Heavy Vehicle Regulator.

4.2.7 Other uses of information

The model fatigue legislation requires a work diary to record the work and rest of a driver. In an electronic work diary it is possible to do much more with the data. For example, it would not be a significant task to have the electronic work diary determine and display the driver's compliance to the relevant regulated working hours' provisions. An electronic work diary, in this example, could be made to have a timer counting down the allowed work for the driver prior to taking a rest.

This functionality could assist a driver in knowing how long they have left before requiring a break and assist them in managing their compliance. Further, if this functionality was also present for rest breaks, then it would be difficult for drivers to accidentally declare a rest that was marginally under the required limits. For example, when the driver declares that they are resting, a counter could appear on a screen counting down the time to the end of the minimum legal rest.

Extending this theme, an electronic work diary could easily report breaches (or impending breaches) to operators, allowing intervention prior to an offence being committed. For example, if an impending breach is transmitted to an operator, they may be able to call the driver and offer an alternative schedule to allow the driver to operate legally and still achieve the freight task.

Extending this theme further, gross noncompliance with the regulated driving hours could be reported directly to the regulator, allowing for intervention by enforcement officers.

While these provisions are not possible with a written work diary nor required under the model fatigue legislation there may be features that individual providers of electronic work diaries could offer to enhance the functionality and attractiveness of their product.

The focus of this paper is the guidance material on the minimum requirements necessary to enable the provision of electronic work diaries under the model fatigue legislation. Other uses of information beyond the minimum standard to assist compliance is however welcomed and encouraged.

4.2.8 System malfunction

The model fatigue legislation requires an electronic work diary to indicate to the driver if it is malfunctioning. In the case of a malfunction, the driver is required to notify the record keeper within two days and the record keeper is responsible for returning a malfunctioning electronic work diary to working order.

As introduced in Section 4.2.4 and discussed in Section 6.3.7, an electronic work diary is not just a device, but rather a system for recording driver information required by the model fatigue legislation. The system may range in complexity and incorporate a device within a vehicle, a communication network and a back-office receiving system.

Recognising this, a malfunction may not be confined to just the device within the vehicle. A malfunction may occur within the communication network or the back-office system. It may therefore be difficult for a device within a vehicle to monitor all components of the system and report this to the driver.

To effectively monitor the functionality of an electronic work diary may require the combination of diagnostics within the in-vehicle equipment, diagnostics of the back-office system and some level of overall system monitoring by personnel well versed in the design and operation of the system. It is recognised that the competencies of the record keeper may not extend to the rectification of electronic devices and as such, there may need to be a relationship between the record keeper and a ‘caretaker’ that has the competency to monitor the operation of the electronic work diary and rectify the electronic work diary if necessary.

This model is not new to the ICT industry. Commonly referred to as ‘service providers’, these entities assure the continued provision of a service. Telephone companies, electricity suppliers and road traffic authorities are all examples of service providers. Telephone companies ensure the electronic communication channel remains operational and rectifies faults. Electricity companies ensure there is enough power for all users and repair lines or faults as required. Road traffic authorities manage the road network and rectify faults with the road and traffic signals associated infrastructure.

4.2.9 Cost–benefit ratio

Pragmatically, an electronic work diary will only be adopted and enforced if it brings advantages to its users that outweigh its costs. Operators will not adopt the technology if the costs to implement exceed the perceived benefits. States and territories are unlikely to approve devices that do not deliver improved compliance or have increased costs for enforcement.

For example, if the specification for electronic work diaries contains requirements that substantially increase the cost of solutions beyond that of commercial systems, then operators will continue to run commercial electronic record-keeping systems and written work diaries. Operators who have not made the shift to using in-vehicle telematics will also not be swayed to adopt this new technology.

This situation extends to the enforcement community. If the specification requires significant changes to the process or equipment required by the approving authority, then authorities may choose not to approve any electronic work diaries. Further, if the task of

assessment is too onerous or is incapable of being enforced, enforcement officers may not continue with fatigue checks.

For example, if an electronic work diary requires a printer to provide records to enforcement officers and drivers know that claiming a broken printer results in the enforcement officer not checking their electronic records, then this excuse will become common within the industry. Further, if an enforcement officer has no alternative to view the records or the process is too time consuming, the review of the records will practically become an unenforceable activity.

The specification for electronic work diaries will need to balance the cost, complexity, robustness and ease of use for stakeholders if it is to be successfully adopted.

4.2.10 Roles, responsibility and the legislation

The model fatigue legislation recognises the roles and associated responsibilities of the driver and the record keeper. These roles are sufficient for the operation and record-keeping obligations of a written work diary.

The legislation does not introduce any other roles when describing the environment of the electronic work diary. As highlighted in Section 4.2.8, complex electronic work diary systems that involve many integrated components may require the introduction of a separate entity to perform the monitoring and rectification of the work diary.

It may be argued that, like other parties within the chain of responsibility, this entity should bear legal responsibility to maintain the equipment and rectify problems within a timely manner if required. Currently, the legislation places the responsibility for identifying a malfunction with the driver and the responsibility to rectify or have the diary rectified with the record keeper. This is discussed further in Section 6.3.8.

4.3 Speed management

Unlike the model fatigue legislation, comparative speed legislation does not require the speed of a vehicle to be recorded with a regulatory record-keeping system.

While speed must still be managed by drivers and entities within the chain of responsibility, its management is not recorded nor is its compliance checked during roadside interception. Rather, traditional speed compliance is conducted via point-in-time speed detection, such as radar or speed cameras, or point-to-point detection where cameras identify the vehicle at two points and averages its speed.

In-vehicle telematics can offer the ability to continuously monitor the speed of a vehicle and record this speed for compliance review. Speed measurements every second are available if a GPS is utilised. If the in-vehicle telematics technology incorporates a direct connection to the vehicle (e.g. gearbox) then higher frequencies of speed measurements are possible.

However, the policy for continuous speed monitoring is relatively immature as opposed to point-in-time or point-to-point monitoring. The equipment, system requirements and how the speed data is generated and used are all issues and are discussed in the following sections.

4.3.1 Equipment

The monitoring of heavy vehicle speed requires the ability to determine the speed of the vehicle, store this speed and provide this to an end user. Unlike an electronic work diary, it is not practical to manually capture speed information.

Speed monitoring is not new. Speed limiters installed on heavy vehicles monitor the vehicle speed and restrict this to the maximum allowable speed for that class of vehicle. This may be implemented through either an electronic system monitoring the drive train and engine diagnostics or through a physical governor on the drive shaft or gearbox. While this equipment is common, so is the practice of tampering with this equipment, rendering it ineffective.

GPSs that provide time, location and speed recordings are becoming increasingly commonplace for many passenger-vehicle drivers. Usually contained within a satellite navigation device, this equipment is relatively cheap, accurate and does not rely on integration with the vehicle (i.e. connection to the vehicle's gearbox or engine management system).

GPSs are also difficult to covertly tamper with. For example, it is difficult to make a GPS receiver record a speed 10 km/hr lower than the actual speed.

In contrast, it is simple to remove or tamper with the antenna of a GPS receiver. However, this form of tampering is relatively evident because the self-reported data quality drops to an unexpectedly low quantity that is easily detected.

To be able to manage speed compliance against speed zones rather than just the state maximum, the location of the vehicle will need to be acquired to determine which zone the vehicle is travelling in. GPSs also provide this functionality.

Regardless of the technique used, speed monitoring will require a sensor to be able to capture the vehicle speed and a mechanism to store and provide this information to a user.

4.3.2 Speed data

As mentioned within the introductory section, speed data may be collected at significantly high frequencies as opposed traditional speed-detection techniques. This has the potential to generate an accurate representation of the vehicle's travel, minimising the opportunity for missed speeding events.

After the necessary speed-monitoring equipment has been purchased, the capture of the speed data will usually be cost free. Information collected from the vehicle or via a global position system receiver is free. However, the transmission of this data to the end user may incur a cost. For example, if the telematics application relies upon the Global System for Mobile communications network (GSM mobile phone network) then the provider of the network will charge a fee based upon the amount of information communicated.

From these two perspectives, a balance needs to be reached whereby enough speed data is captured to provide an accurate representation of the vehicles travel while not capturing so much data that its transmission costs become prohibitively expensive.

4.3.3 Uses of the data

Authorities have a significant body of knowledge on point-in-time speed compliance and its associated penalty regime. The sizes of infringements are determined based on the severity of the breach. Point-in-time speed detection is relatively infrequent and as such motorists who speed intermittently will only rarely be detected. As such, the infringement is usually set at an appropriately high level to deter noncompliance. Point-to-point speed enforcement is less widely used in Australia but is common overseas. It measures the time taken by a vehicle to cover a longer distance (tens or even hundreds of kilometres) and can be used to prosecute a driver on the basis of their average speed over that distance.

For continuous speed monitoring, all speeding breaches, independent of the severity or frequency, are able to be detected. For example, a vehicle travelling between Melbourne and Sydney may breach the speed limit hundreds of times and not be detected by traditional speed-detection techniques. However, with a continuous speed-monitoring device, all of these breaches could be detected.

Data from in-vehicle speed monitoring can not be used for enforcement of individual speeding offences under current Australian law.

Continuous speed-monitoring data can be used to inform operators of the speed of their drivers either in real time or post trip. This may be used by operators to manage drivers and discuss driving behaviour with drivers should non-compliances exist. Without a speed-monitoring device, this is only possible after the driver has been detected and infringed by roadside enforcement.

The ability to manage driver speed behaviour and implement controls also allows operators to demonstrate clearly how they are meeting their obligations under the speed chain-of-responsibility legislation.

4.3.4 System

While applicable speed-compliance laws do not include legal requirements of speed-monitoring systems, some requirements may be logically derived.

As a speed-monitoring device monitors the vehicle and driver combination, the speed-monitoring device will need to be able to identify and authenticate the driver. These concepts are discussed in Section 4.1.2.

The compliance management of heavy vehicle speed is not dependent on historical information. Unlike the limits of work and rest contained within the model fatigue legislation, speed compliance does not rely upon previous driving history. As such, a heavy vehicle speed-monitoring device or data does not need to be transferred from system to system or from operator to operator.

For the information derived from a speed-monitoring device to be useful for compliance management, the information must have a high degree of integrity. Since there are many examples of speed-limiting devices that have been tampered with, this may be a considerable task and require quality-assurance techniques such as regular audits and inspections.

If the information derived from a speed-monitoring device is to be used as evidence for the prosecution or defence of a charge under the speed chain of responsibility, then the system will need to be designed such that it can generate, store and provide information in a suitable way so that it can be considered as credible evidence. Many of these concepts are discussed in Section 4.2.3.

5. STAKEHOLDER FEEDBACK

Thirteen submissions were received in response to the invitation to comment on the *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* (NTC 2009). The respondents included transport agencies and authorities, system suppliers, transport operators and industry associations. A summary of responses along with the original responses are provided in Appendix E.

Respondents identified a number of the issues discussed within Section 4. The themes from the feedback have been grouped into eight categories as follows:

1. the integrity of an electronic work diary
2. relationship between an electronic work diary and the Intelligent Access Program
3. legislative changes required for an electronic work diary
4. sanction policy review required for an electronic work diary
5. policy review required for an electronic work diary
6. connection between an electronic work diary and speed monitoring
7. technical requirements of an electronic work diary
8. transition arrangement for an electronic work diary.

Each of these categories and the associated themes are discussed below.

While not formally part of this submission process, a summary is also provided on the thoughts of the Austroads Steering Group, which provided direction to the team developing the performance-based specification for heavy vehicle speed and driver fatigue monitoring systems. This group consisted of senior representatives from the Commonwealth Government and state road agencies (that have adopted the model fatigue legislation) and included representatives from the NTC.

5.1 The integrity of an electronic work diary

Most respondents commented on the integrity of information available from an electronic work diary including, Roads and Traffic Authority (New South Wales), Department of Transport (Victoria), Department of Transport, Energy and Infrastructure (South Australia), Department of Transport and Main Roads (Queensland), Australian Trucking Association and Tasmanian Forest Contractors Association. Integrity may be considered as the assurance that information has not been accidentally or maliciously altered or destroyed. While most respondents agreed that an electronic work diary must assure a high level of integrity, differences existed in the interpretation of what constitutes a 'high degree'.

One respondent argued that commercial electronic record-keeping systems that are used within the transport industry offer sufficient protection of information for use as electronic work diaries. As these systems have been selected to be used for business and operational decision making, it could be argued that this justifies their suitability as systems to demonstrate compliance to regulations (Australian Trucking Association).

Another respondent argued that commercial electronic record-keeping systems do not provide sufficient protection of information for use as a regulatory system. It could be argued that the motivation of the users of commercial systems and electronic work diaries are significantly different and this reflects in the design of information protection within these systems (Roads and Traffic Authority New South Wales).

A commercial system is not recognised as a regulatory instrument and therefore is not offered to enforcement officers at the roadside for inspection. Any information that is contained within a commercial system is unlikely to be compared with regulations and as such has little chance of incriminating its users. Conversely, any information contained within an electronic work diary will be used by enforcement officers to determine the

compliance of drivers and, therefore, the motivation to change any incriminating information may be substantially greater.

This argument continues with one respondent identifying that commercial systems are not designed to provide roadside enforcement with evidence. These respondents also identified that the lack of standardised output from commercial systems will cause insurmountable challenges for the enforcement community in reviewing data at the roadside (Roads and Traffic Authority New South Wales).

Other respondents quantify the integrity assurance required by an electronic work diary by comparing it with that contained within the written work diary. Some respondents believe the requirements of the electronic work diary should be no more onerous to those contained in the written work diary (Australian Trucking Association), while others believe the electronic work diary should maintain at least as much, if not more protection to information as contained within the written work diary (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Tasmanian Forest Contractors Association, Department of Transport (Victoria)).

A respondent also commented on the necessity for automatic data capture within an electronic work diary. This respondent argued that it would be logical to extend the functionality of an electronic work diary to require the automatic capture of time and location (Roads and Traffic Authority New South Wales). This respondent also argued that this automatically captured information should be protected from alteration by the driver. Another respondent argued that the required functionality of an electronic work diary should not be any greater than that of the written work diary (Australian Trucking Association). This argument would support manual data entry of all data including time and location data.

5.2 Relationship between an electronic work diary and the Intelligent Access Program

Some respondents commented on the connection of an electronic work diary and the Intelligent Access Program (IAP) (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Fleet Effect, Australian Trucking Association). The Intelligent Access Program utilises secure in-vehicle telematics equipment to monitor the time, location and speed of a vehicle's travel and provides this to an Intelligent Access Program Service Provider (IAP-SP). The IAP-SP is then required to compare the vehicles travel with authority-provided network access conditions. Breaches of the access conditions are provided to the authority in the form of an automated electronic report.

Some respondents commented that an electronic work diary application should become part of the IAP (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Fleet Effect). Technology used as part of the IAP would be suitable for use as an electronic work diary and reduce duplication of hardware for users requiring both applications.

Conversely, another respondent argued that the IAP represents a more secure level of monitoring than what is required by an electronic work diary application. This respondent believed that the IAP would be a more suitable tool for supervisory intervention orders (Australian Trucking Association).

Respondents also stated that there should be a single application process between the IAP and the electronic work diary (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Fleet Effect). It can be argued that an

electronic work diary will require the technical assessment of the telematics equipment similar to the assessment Transport Certification Australia (TCA) carries out for equipment used within the IAP. TCA is a public company owned by governments that administers the IAP and certifies and audits systems provided by IAP-SPs.

5.3 Legislative changes for an electronic work diary

Respondents broadly supported the development of guidelines to support the approval of electronic work diaries, but confusion existed on what the guidelines would detail (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Department of Transport, Energy and Infrastructure (South Australia), Department of Infrastructure, Energy and Resources (Tasmania), Australian Trucking Association). A respondent believed the guidelines would provide broad guidance on the requirements of an electronic work diary (Australian Trucking Association), while another interpreted the term guidelines to be equivalent to a functional and technical specification (Roads and Traffic Authority New South Wales).

Accompanying the broad support for the guidelines was agreement that legislative changes were necessary before electronic work diaries could be approved (Roads and Traffic Authority New South Wales, Department of Transport (Victoria), Road transport and road safety advocate). These comments focused on the counting of time provisions and the roles and responsibilities of entities within the legislation.

The model fatigue legislation currently states that time must be counted in blocks of 15 minutes for all work diaries. Work time is rounded up to the nearest 15-minute block while rest time is rounded down to the nearest 15-minute block. Respondents recognised that this rounding algorithm is not strictly followed by users of the written work diary but would be followed in the electronic work diary (Roads and Traffic Authority New South Wales, Department of Transport (Victoria), Road transport and road safety advocate). This disparity may provide a disincentive for adopting electronic work diaries.

Respondents broadly agreed that time should be recorded to a resolution significantly finer than 15 minutes (i.e. 1 min, 1 sec etc.), but changes must be made to how work and rest are counted within the legislation (Roads and Traffic Authority New South Wales, Department of Transport (Victoria), Department of Infrastructure, Energy and Resources (Tasmania), Department of Transport, Energy and Infrastructure (South Australia), New Zealand Transport Agency, Australian Trucking Association, Road transport and road safety advocate, Circuitlink).

A respondent identified that in shifting from a paper to an electronic environment, it may be necessary to recognise the responsibility of other entities in the legislation (Roads and Traffic Authority New South Wales). This argument extends from the complexity contained within an electronic work diary. Unlike a written work diary, the competencies required to install, maintain and monitor the ongoing operation of an electronic work diary may fall outside the core competencies of the driver or record keeper. Legal responsibility for these functions may need to be explicitly stated within the legislation and assigned to someone other than the driver or record keeper.

5.4 Sanction policy review required for an electronic work diary

Along with recognising the need to change the counting time requirements within the legislation, many respondents identified that if a more accurate recording of time is to be required within an electronic work diary, a review of the sanction policy will also be required (Roads and Traffic Authority New South Wales, Department of Transport (Victoria), Department of Transport, Energy and Infrastructure (South Australia),

Department of Infrastructure, Energy and Resources (Tasmania), New Zealand Transport Agency, Australian Trucking Association, Road transport and road safety advocate, Circuitlink).

Sanctions within the legislation are currently imposed based on the expectation that only breaches of longer than 15 minutes will be identified due to the current counting time regime. However, if the resolution of time is increased without a corresponding penalty review, breaches of one minute may attract the same penalty as breaches of 15 minutes.

5.5 Policy review required for an electronic work diary

Some respondents believed the *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* lacked clear policy and suggested that more depth was required on the regulatory and compliance strategies for both fatigue and speed monitoring (Roads and Traffic Authority New South Wales, Department of Transport and Main Roads (Queensland), Tasmanian Forest Contractors Association). Other respondents believed that the policy on the use of the electronic work diary must be underpinned by a detailed cost–benefit analysis (Tasmanian Forest Contractors Association).

Central to the policy debate was whether an electronic work diary should be mandatory in its application and replace the written work diary. Most respondents agreed that electronic work diaries should remain an optional alternative to the written work diary citing the cost–benefit of shifting to an electronic environment may not be substantiated for all segments of the industry (Department of Transport and Main Roads (Queensland), Department of Transport (Victoria), New Zealand Transport Agency, Australian Trucking Association, Bus and Coach Association, Tasmanian Forest Contractors Association). Another respondent argued that by mandating an electronic work diary, costs of in-vehicle telematics equipment would be lowered and a significant safety benefit would result (Fleet Effect).

Another respondent questioned the value of providing guidance material for supervisory intervention orders (Department of Transport (Victoria)). By explicitly providing advice for the use of an electronic work diary under a supervisory intervention order, a negative perception of the electronic work diary may be created due to its connection to a punishment technique.

5.6 Connection between an electronic work diary and speed monitoring

Respondents provided mixed commentary on the topic of speed monitoring (Department of Transport (Victoria) and Roads and Traffic Authority New South Wales). It was identified that operators or drivers who currently falsify records to gain an advantage by unsafe driving hours, cannot do so with an electronic work diary and may seek to extract the same unfair competitive gains by increased speed (Roads and Traffic Authority New South Wales).

Another respondent provided commentary on the technical hurdles of speed compliance assessment ((Department of Transport (Victoria)). To determine the compliance of a driver, the location, time, speed and speed zone will be required. This necessitates a continuous and accurate monitoring technology (e.g. GPS) and a national regulatory digital map containing speed zones. While GPS technology is relatively cheap and is commonly part of in-vehicle telematics technology, a national regulatory digital map containing speed zones does not yet exist.

5.7 Technical requirements of an electronic work diary

Some respondents commented on the technical requirements of an electronic work diary (Department of Transport and Main Roads (Queensland), Fleet Effect, Roads and Traffic Authority New South Wales, Circuitlink, Department of Transport (Victoria)). There was a desire for electronic work diaries to be available to both large and small operators and that the requirements allow for many different technologies (Department of Transport and Main Roads (Queensland)).

This implies that the minimum requirements of an electronic work diary should not require a costly solution nor should the requirements be prescriptive of any single technology.

Respondents commented on the need for a strong form of identity management citing techniques that included biometric information (Roads and Traffic Authority New South Wales, Department of Transport (Victoria)).

Respondents commented on some of the challenges involved in the assessment task that will be involved in approving electronic work diaries (Department of Transport (Victoria), Circuitlink). One significant challenge if multiple agencies are used for assessment will be the ability to maintain equality between assessors. A respondent recommended that a single organisation should be used to address this issue (Roads and Traffic Authority New South Wales).

Another respondent recommended that electronic work diaries should not utilise in-vehicle printers (Fleet Effect). In-vehicle printing will increase the complexity and cost of the solution and potentially reduce the reliability of the electronic work diary.

5.8 Transition arrangement for an electronic work diary

There was broad support from respondents for transitional arrangements (Roads and Traffic Authority New South Wales, Department of Transport, Energy and Infrastructure (South Australia), Australian Trucking Association, Tasmanian Forest Contractors Association). Transitional arrangements recognise a pathway for operators that have current electronic record-keeping systems to transition to systems that are suitable for approval as electronic work diaries. This concept recognises that operators may have systems that meet much of the requirements of an electronic work diary but fall short in some areas.

5.9 Austroads Steering Group

The Austroads Steering Group (the Group) was assembled to provide direction to the team producing the performance-based specification. This group intended to provide direction to allow the development of the specification to continue while NTC worked on progressing the policy.

While this Group tried not to provide policy advice, some views on how the electronic work diary should operate were necessary, making it impossible not to provide some policy advice.

Ultimately the policy will be driven by the consultation process of stakeholders in conjunction with the research performed by the NTC. However, the view of the Group provides an insight into some of the issues discussed above and as such is important to consider.

Two of the most significant points from the group were to do with integrity of information and printing at the roadside.

The steering group believed that the progression to an electronic environment should not be just for the sake of changing the recording mechanism, but rather to provide an improvement in the recording system to all stakeholders. The information recorded by an electronic work diary is used in the first instance by authorities to determine driver compliance and in the second instance as a basis for operational decision making by operators. Common to both of these stakeholders is the requirement for accurate information. Inaccurate information does not allow compliance to be determined nor good decisions to be made. As such, the Group believed that due to the low cost imposition of automatic data capture, this should be a minimum requirement of the system. As presented in Section 5.1, where the majority of the work task involves driving, the integrity of the system may be increased by utilising an independent measure of time and location.

The Group also recommended that the specification does not include a printing facility. This decision was reached after considerable debate. Without a printing facility within the cabin of the truck, it could be argued that roadside officers without suitable electronic equipment do not have an avenue to review driver records. However, the group also recognised that, in many instances, the cabin of the truck is not a suitable environment for the reliable operation of a printer and the cost imposition of making this part of the electronic work diary system will negatively impact industry take-up. As such, the steering group recommended that it is not placed in the specification and an investigation of the actual impact of this on the enforcement community be undertaken.

6. POLICY OPTIONS FOR ELECTRONIC RECORD KEEPING

The NTC identified two problems in the *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* released by the NTC in July 2009:

Problem 1: While the regulations for the use of electronic work diaries currently exist, approvals are being impeded by the absence of agreed national processes or guidance for their use in managing compliance.

Problem 2: There is an absence of guidance material on the available tools that courts may use for fatigue and speed compliance. This lack of guidance material limits the effectiveness of supervisory intervention orders as a sanctioning mechanism.

While the speed chain-of-responsibility legislation does not contain record-keeping obligations, it does require the entities within the chain to take reasonable steps to manage a driver's speed compliance. Unlike the work diary, entities within the chain have had little at their disposal to actively manage the driver's speed until they have been caught by roadside enforcement.

NTC proposed three options to address problem 1:

- Option A1: Do nothing (keep the status quo).
- Option A2: Develop guidelines consistent with Section 74(4) of the model fatigue legislation.
- Option A3: Develop an approval process and an alternative compliance framework for electronic work diaries.

NTC proposed two options to address problem 2:

- Option B1: Do nothing (keep the status quo).

- Option B2: Develop guidance material on the tools available that courts may use for fatigue and speed compliance.

The options are discussed in more detail below.

6.1 Problem 1: Options discussion

Respondents to the consultation process of the draft position paper released in July 2009 did not support options A1 or A3.

Option A1 (do nothing) does not address the problem and would not result in approvals of electronic work diaries. As such, the NTC believes this option is not viable.

Option A3 (developing an approval process and alternative compliance framework) would, from a regulatory perspective, address the problem but may not be supported by industry.

Option A3 proposed a continuous monitoring regime and either electronic audit or electronic compliance reporting to the Authority. This option has the potential to remove work diary review from roadside enforcement and provide a time saving to both operators and Authorities. However, as roadside enforcement incorporates a number of compliance checks including vehicle inspection for roadworthiness, until these checks can also be removed from roadside enforcement the actual time saving may not be significant.

Further, the leap from a paper-based environment to the alternative fully electronic compliance framework may be too large for many operators and drivers. Concerns were expressed from industry on how electronic records may be reviewed at the roadside and what the policing policy may be for small breaches of the law during roadside inspection. In an alternative compliance policy framework, this concern becomes even more significant because all breaches could be reported.

Respondents to the position paper did support option A2. Option A2 consisted of developing guidelines consistent with Section 74(4) of the model fatigue legislation. The guidelines would encompass the necessary steps for an authority to approve an electronic work diary application. For example, the guidelines would make reference to any application forms and applicable processes, submission requirements and technical specifications. This concept is shown in Figure 4.

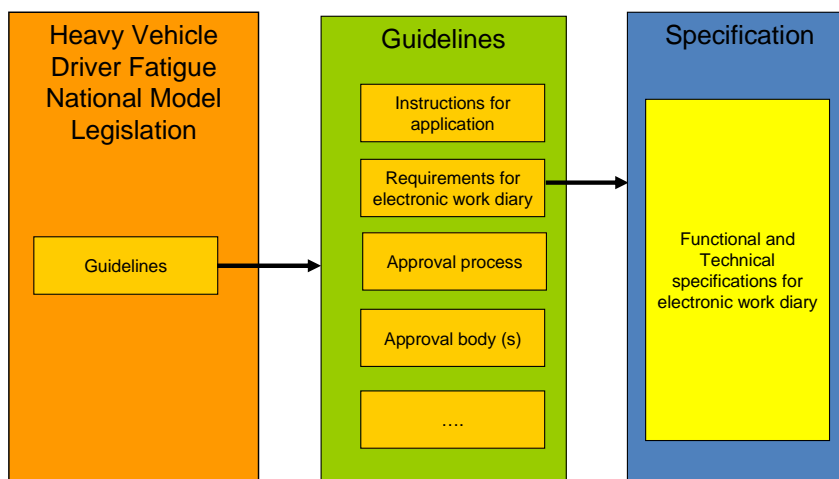


Figure 4: Relationship between legislation, guidelines and specification

A discussion of the content of the guideline is provided below.

6.2 Option A2: Develop guidelines consistent with section 74(4) of the model fatigue legislation

The guideline consistent with section 74(4) of the model fatigue legislation describes the application and approval process for an electronic work diary.

The approval process is designed to provide approving authorities with the necessary steps to be able to approve an electronic work diary solution. To do this, authorities will require the confidence that the electronic work diary system can meet the requirements contained within the model fatigue legislation and the operational environment of the written work diary.

Unlike the written work diary, it will be very difficult for authorities to have confidence in the system without the system being tested. Authorities must have the capability to rely on the information provided by the electronic work diary to the extent that the information can be used as evidence within a prosecution.

As such, the guideline must contain the necessary testing of an electronic work diary and the process of providing the confidence to authorities in readiness for their approval. The testing of electronic work diaries is discussed further in the following section.

6.2.1 Testing of the electronic work diary

Unlike the single-format written work diary, it is expected that many different electronic work diary solutions will be presented to authorities. While the output of each system must meet legislative and operational requirements, the way in which each system achieves this output will be dependent on the hardware and software design.

Before authorities approve electronic work diary systems, they will require the confidence that the hardware and software design is capable of providing information suitable for regulatory use as an alternative to the written work diary. Authorities cannot afford to trust a system on face value only to find out it is not capable of providing the necessary information during a prosecution. Specifically, authorities will need to be confident that systems can:

- operate reliably in accordance with the regulatory and operational requirements
- interoperate with other suppliers or enforcement systems
- adequately protect the integrity of the information
- adequately protect the information once stored
- continue to meet the regulatory and operational requirements as threats to the system evolve.

It is expected that this shall not be able to be achieved without each system being tested to demonstrate its ability to meet the Authority's requirements and that it is likely that this testing will be beyond the ability of the Authority.

Australian Standards (AS 17000 series and the related HB 68 series of handbooks) defines this type of testing as conformity assessment. These standards identify three broad strategies for assessing conformity. In the context of an electronic work diary system, these strategies are:

- First-party conformity assessment – in which assessment is performed by the supplier of the electronic work diary. This strategy is generally applicable in cases where the supplier already has established trust within the market and the risks associated with

incorrectly assessing a non-conformant system as being conforming are minor or are capable of satisfactory mitigation by other means.

- Second-party conformity assessment – in which assessment is performed by a person/organisation with a user interest in the electronic work diary (e.g. a buyer of a product). For example, if a system is purchased from a supplier then the buyer would test the system for conformance. This strategy is generally applicable in cases where the risks of non-conformance are significant for the assessor and the supplier but are minor for any other stakeholders.
- Third-party conformity assessment – in which assessment is performed by a person/organisation that is independent of both the supplier and the user interests. This strategy is applicable in situations where the risks of non-conformance are significant for multiple stakeholders other than a single acquirer and seller. For example, when there are external regulators and/or multiple suppliers whose components need to interoperate reliably.

An electronic work diary system is expected to be a complex, distributed information system linking drivers, record keepers, enforcement officers and other parties within the chain of responsibility. For example, an electronic work diary system will have:

- multiple users interacting with each other in complex ways – for example, one driver may perform work for multiple operators; one record keeper may manage records for multiple drivers
- multiple interacting system components, including driver recording devices, in-vehicle telematic equipment, systems operated by enforcement officers and back-office systems involved in driver registration and records maintenance
- multiple external stakeholders with critical risks being managed through the system, including regulators, and government
- potentially different service delivery models such as systems provided and operated by transport operators and/or by independent third-party service providers.

Based the broad range of designs and implementations of electronic work diary systems, the range of stakeholder interests, the potential for multiple suppliers with requirements for interoperable components, and the critical risks that impact on regulators and the general public (especially those relating to compliance and evidence), it is unlikely that authorities would be confident with approving systems that had not been assessed by an independent third party. This is consistent with practice in other comparable complex distributed information systems with significant regulatory implications including the IAP, digital tachographs and telecommunications systems.

A third-party conformance assessment model can be implemented in many different ways. For example, the third party may conduct all testing themselves or use a combination of testing and audit of the supplier's testing to make their assessment. Whichever avenue is chosen, it is likely that the conformance assessment will be part of a certification process where the system is certified as meeting the requirements of the guideline ready for approval by the authority.

It is interesting to note that part of this requirement for third-party assessment comes from the freedom provided by a performance-based specification approach. Under this approach, designers of systems are given the greatest choice in hardware, software and architecture. This flexibility produces uncertainty for the authority because they have little knowledge of how the particular implementation will meet the regulatory or operational requirements.

The performance-based approach is significantly different from the current written work diary implementation. The written work diary is a closed, single-use, prescriptive device. While there may be multiple printing facilities producing the diary, there is only one design for all drivers. Testing this one design provides authorities with the confidence to know that the diary can deliver the necessary information to support a prosecution if required.

6.2.2 Guideline and application process

The guideline is designed to describe the application process and makes reference to all the necessary requirements of the applicant including the performance-based specification.

Broadly, the application process requires the applicant to have had their submission certified by an approved certification body. Authorities will hold lists of approved certification bodies. It is anticipated that the approval process could be managed by a National Heavy Vehicle Regulator.

Each certification body will maintain a current version of the functional and technical specification that contains the requirements of an electronic work diary system. Applicants will be required to acquire a copy of the specification from the Authority they intend to seek approval from.

Each certification body will have a process by which the applicant applies to have their electronic work diary certified. The applicant will follow the process detailed by the certification body to provide sufficient information for the diary to be assessed. For example, upon application to the certification body, the applicant may be provided with the specification and a checklist that must be filled out. The certification body would use the populated checklist and any associated documentation in conjunction with an example of the electronic work diary system to assess whether it meets the functional and technical requirements with the specification.

The applicant will be provided with a certificate from the certification body upon successfully meeting the requirements. The applicant then provides this certificate and applies to the authority for approval of their electronic work diary system.

Once satisfied with the evidence provided by the applicant, the Authority shall grant approval of the electronic work diary system.

An applicant whose application is not approved may appeal this decision with the Authority. Each authority will have processes to appeal rejected applications.

Section 11 provides the guideline for approval of electronic work diaries.

The recommendations for the functional and technical requirements of the electronic work diary are discussed below.

6.3 Performance-based specification for an electronic work diary

This section describes the NTC's recommended requirements for an electronic work diary.

To communicate and fairly assess these requirements, it is necessary to contain these within a specification. A specification provides more than just advice and aims to provide developers with a level of detail such that they may design a solution that may be fairly approved.

Readers should note that while these requirements are discussed within this section, the translation of these requirements into functional and technical requirements is detailed within the specification referred to within the guideline.

6.3.1 Entry of data

As required by the model fatigue legislation, the electronic work diary must record the driver's declarations of work and rest. At a minimum, the driver needs to enter in the information required under Section 57 of the model fatigue legislation.

Electronic work diary systems are not required to, but may, assist drivers in making their declaration. For example, an electronic work diary system may use a GPS to populate time and location information within the driver's declaration.

Consistent with Section 74(3e) of the model fatigue legislation, where the diary assists the driver in making their declaration, the electronic work diary will require the driver to confirm the details as being correct. If the details are not correct, the driver will be able to alter the details.

As discussed in Section 4, a significant motivation for operators to shift to an electronic work diary is the increased integrity it offers. If operators choose systems that assist drivers in making their declarations by populating information, then these systems will allow a driver to change the information but also record the details of any change. While the ability for the driver to confirm and change records in the electronic work diary is a legal requirement, doing this without an auditable trail diminishes the potential integrity gains sought by the operator. As such, in systems that offer driver declaration assistance, details of the declaration that the driver changes will be recorded such that the original information populated for the driver's acceptance is still available for audit.

In electronic work diary systems that provide assistance in the driver's declaration, the information must be recorded in a format suitable for the driver to confirm its accuracy. For example, presenting a latitude and longitude to a driver to confirm would not be suitable without a corresponding English description of the location.

Providing this flexibility of data entry allows varying technology and designs to be submitted for approval and allows operators to choose the solution that is right for them. This is consistent with the consultation feedback of ensuring that a range of technologies may be used and that solutions are available to both large and small operators.

NTC position summary

Electronic work diaries must allow the manual entering of information within a driver's declaration.

Electronic work diaries may provide assisted entering of information within the driver's declaration, so long as the following conditions are met:

- the information is in a format suitable for the driver to understand
- the driver must confirm the information
- drivers can alter information they believe is incorrect
- details of any alterations are recorded.

6.3.2 Driver identification and authentication

Since it is critical that the driver makes the declaration, an electronic work diary will require a method of identification and authentication. The method of identification and

authentication will automatically populate the appropriate identification details described under Section 57 of the model fatigue legislation.

Consistent with the performance-based directive from the ATC, the method of identification or authentication should not be prescribed, but rather meet a standard that is equivalent to the driver's signature as used with the written work diary.

The method of identification and authentication will be used for each and every declaration that the driver makes. This measure ensures each declaration is authentic.

NTC position summary

Electronic work diaries should contain a method of identification and authentication consistent with the standard of the driver's signature used within the written work diary.

The method of identification and authentication should be used for each driver declaration and automatically enter the driver's personal details required under Section 57 of the Heavy Vehicle Driver Fatigue National Model Legislation.

6.3.3 Data integrity

The integrity of the information within an electronic work diary may be conceptualised as the integrity of the data capture and the integrity of the data storage.

Feedback from the consultation on the position paper presented two main themes. One theme stated that the electronic work diary should have a high level of data integrity but should not be more onerous than the written work diary. The second theme stated that an electronic work diary should have a high level of data integrity that should be at least equal to the written work diary.

From this feedback, it may be surmised that an electronic work diary should, at a minimum, protect the integrity of the data to at least the same standard as the written work diary.

The integrity of the written work diary, by its design, can only offer controls to protect the integrity of the data once it has been entered. There is little in the written work diary that makes a driver enter the 'correct' information.

In an electronic work diary, for work involving driving, the integrity of the captured data can be increased by using automatic data-capture techniques. While increasing the integrity of the data within the electronic work diary, this shifts the functionality further than that of the written work diary.

In some cases this will be a logical function to include in an operator's electronic work diary. Operators that currently have a 'track and trace' solution are already collecting data that may be akin to that required, at least in part, under an electronic work diary. For these operators, the necessary equipment may already be installed and the ability to utilise the automatically captured information of their 'track and trace' solution removes the dilemma of having two potentially contradictory sources of information at their disposal (i.e. information from a track and trace solution and information from the driver's manual entry).

In some cases operators may want to maintain the ability to enter information manually. This may be due to a perceived saving in the capital investment of the system or they may

only want to utilise the electronic work diary to fulfil their legal obligation and are confident of the integrity of their manual data entry.

The NTC believes that operators should be able to decide if the data contained within a driver declaration should be captured through an automatic or manual means. That is, as long as the minimum requirements required by the legislation, and equivalences from the written work diary are met, then the operator can choose the extra measures to assure data integrity offered by their system.

Operators that choose to run a multiple information system should be able to consider the ramifications and the risks of conflicting information available to authorities. For example, an operator using a fleet tracking system and a manual driver declaration electronic work diary must ensure the information recorded by both systems does not conflict. Operators should make this decision in the recognition that while an electronic work diary shall assure the integrity of the information post capture, only systems that utilise automatic methods of data acquisition may be considered as providing integrity gains greater than that of the written work diary.

Post capture, electronic work diaries shall assure the data quality to at least the level offered by the written work diary. To achieve this, designers of electronic work diaries should consider the ways in which the system can be designed to electronically protect information and maximise its ability to be used as credible evidence.

Part of the strength of the written work diary is its simplicity and its continual operation. To maintain equivalence, the electronic work diary shall provide a highly reliable and robust environment for driver record keeping. In achieving these requirements, designers of systems will need to consider the evolving threats associated with the electronic environment and the necessary technical competency required to rectify faults.

NTC position summary

Electronic work diaries should assure the integrity of driver declarations to at least that as is offered by the written work diary.

Electronic work diaries should be designed to maximise the ability for driver declarations to be used as credible evidence.

The use of electronic work diaries should provide a highly reliable and robust environment for driver record keeping.

6.3.4 Information

Driver declarations are required to be used by:

- enforcement officers in multiple agencies in multiple jurisdictions
- multiple entities in the chain of responsibility
- multiple systems (when transferring across different electronic work diary solutions).

In examining the requirements of the entities further, it is evident that declarations also must be available:

- independent of where they are viewed
- independent to the time that they are viewed
- outside the vehicle
- for capture by the enforcement officer as evidence.

The added complexity of having the driver declarations available at any time and location means that an electronic work diary cannot solely rely upon a cellular communication system to provide declarations to the roadside. Instead, a local copy of at least the last 28 days worth of driver declarations shall need to be kept with the driver.

To meet these user requirements, electronic work diary records shall be stored in a standard format and on a portable standard medium. While it is recognised that this shall need to be prescribed within the specification, it is seen as a necessity to ensure interoperability (i.e. systems can operate with each other). For example, records could be stored on a smartcard or universal serial bus mass storage device (USB memory stick). Whatever memory device is specified, it must be cost effective and contain suitable protection of the information.

Storing records on a removable memory device allows driver declarations to easily provide records to enforcement officers, operators or entities within the chain of responsibility and keeps a copy of the driver declarations with the driver without cellular communications.

The ability for electronic records to be reviewed at the roadside has the potential to reduce the review time for an officer and allow a driver to continue with their task sooner. Unfortunately the entire enforcement community does not currently possess the ability to review electronic information. This produces a significant challenge to the requirements of an electronic work diary.

As explained in Section 4.1.2, the ability for any enforcement officer, to be able to review driver declarations at the roadside is important in providing a strong deterrence against driver noncompliance. Since not all enforcement officers who review work diaries will be suitably equipped to deal with electronic data, it will be necessary for the electronic work diary to display the driver records to an enforcement officer without the need for the officer to have any technology. This can be achieved in many different ways but requires a greater amount of technology to be available within the driver's vehicle. Further, to ensure simplicity and parity with the written work diary, the method to review the driver declarations should be standardised such that reviewers do not need to learn how to review the information for each different system.

The most widely accepted way for this to be met is for the electronic work diary to have a printing facility as part of the electronic work diary solution. From a technical point of view, requiring a printing facility is not ideal. That is, it is recognised that mandating a printing facility as part of an electronic work diary solution will increase the cost and complexity of the solution. It is also noted that many operators believe a heavy vehicle is not a suitable environment for the reliable continued operation of a printer.

Both the transport and telematics industries have provided clear feedback that requiring a printer inside the vehicle is not the preferred approach. Both industries have suggested that either a viewable screen in the cabin of the truck or a back-office solution where the records are sent to the officer or agency at a later date would be preferable. However, these options do not meet our understanding of the enforcement community's current needs. A screen inside a truck is not ideal for enforcement officers who would prefer to respect the privacy of the driver and avoid an OH&S issue by not entering the cabin. Having a removable screen that can be passed to an officer outside the cabin allows officers to review the information but not collect the information as evidence without equipping officers with the necessary camera. A back-office solution that relies on cellular communications coverage limits the places where officers may conduct their roadside intercepts.

Thus, until the enforcement community has suitable equipment and procedures to review electronic records, NTC has not found an alternative that meets all these requirements. The planned pilot of electronic record-keeping devices by the New South Wales Roads and Traffic Authority does, however, provide an opportunity to provide clear practical direction on both the practicality of in-vehicle printers, and the feasibility of meeting enforcement requirements by an entirely paper free solution.

The heavy vehicle driver fatigue national model legislation requires information to be electronically transferred to the record keeper. Where the record keeper is either the operator or employer, this requirement infers that the records will be transferred from the electronic work diary via a direct or wireless connection. Where the record keeper is the driver (i.e. self-employed), the records do not technically need 'transfer' as they are contained on the driver's standardised storage medium.

NTC position summary

Electronic work diaries should record information in a standardised format on a standardised medium.

Records stored in the standardised medium should be appropriately protected.

Electronic work diaries should be able to print records in a standardised format for unequipped roadside enforcement officers.

Electronic work diaries should be able to electronically transfer records to the record keeper.

Consultation

In light of the upcoming New South Wales Government pilot of electronic work diaries, the NTC will consult with stakeholders on viable options to record, display and/or transfer standardised information at the roadside.

6.3.5 Counting time

Consultation feedback supported the need to change the way in which time is counted within an electronic environment. It is important to distinguish between the requirement to record time in a particular way and the legislated maximum work and minimum rest times for drivers. The legislated work and rest times for drivers are the time limits with which drivers must comply. For example, a short rest break must be a continuous minimum of no less than 15 minutes. The counting-time method is the way the driver records their work or rest times in a work diary. For example, a driver must round down a short rest break of 17 minutes to 15 minutes for recording in a work diary.

In recording time in an electronic work diary, particularly if independent confirmation of the time of an entry is recorded from a GPS or other time data, rounding time to 15-minute blocks will result in a growing difference between 'recorded time' and 'actual time' as the day progresses. As such, time must be counted accurately to reflect what the driver does in their work day.

This increased visibility of the driver's work practices also coincides with an increased visibility of driver's breaches of the work and rest limits within the model fatigue legislation. Where drivers using the written work diary can, at a minimum, breach the work

and rest limits by 15 minutes, drivers whose work and rest limits are recorded accurately can be in breach of the regulations by much smaller amounts (i.e. by one minute).

It could be argued that by having an electronic system, the driver may be better informed as the system could be made to indicate how long the driver has left before requiring a rest. This argument relies on the system having the capability to report to the driver the remaining working or resting time. While an attractive feature, this has been identified as being significantly above the capability of the written work diary and as such NTC has deliberately not mandated this as a policy position.

Industry has expressed considerable concern over this issue, highlighting the disparity between the electronic work diary and the written work diary. This inequality may have a significant effect on the adoption of electronic work diaries if left unaddressed.

Both regulators and industry have expressed views that an altered resolution of work and rest should produce an altered work and rest sanction regime. This regime could involve a number of changes to the legislation regarding driver work and rest.

One option is to allow drivers using an electronic work diary a different assessment model against the current regulated work and rest limits. For example, drivers may be compared over a 24-hour period and the accumulated work and rest be examined against the regulated limits rather than individual working blocks. This would potentially allow drivers to work slightly longer on some occasions in exchange for working slightly less on other occasions.

Another option may be the ability to apply an assessment tolerance to the work and rest recorded by the driver in an electronic work diary. This would allow a driver to legally breach the regulations up to a point without receiving a sanction. The ongoing behaviour of the driver can then be examined with repeat offenders being sanctioned.

Neither approving authorities nor industry claim to have a definitive solution to the issue. Both agree that whatever the approach, it must be enshrined within the policy or legislation so that it may be applied fairly by all enforcement. Allowing this to be left to the discretion of the enforcement officer was acknowledged as providing the ability for unfair treatment.

It is, however, important to recognise that moving the regulated working or resting hours is not a solution. The issue revolves around the ability of a driver to breach a limit by a small amount. Moving the limit does not change the ability for a driver to breach a limit by a small amount.

Considering these points, a review of the policing or sanction policy associated with driver breaches when using an electronic work diary is necessary to ensure that the potential benefits of accurate record keeping to improve scheduling and fatigue management are not sacrificed for the sake of prosecuting minor timing errors that pose negligible safety risks.

NTC position summary

Electronic work diaries should record time accurately.

Policing and sanction policies should be reviewed for drivers using an electronic work diary.

6.3.6 Other uses of information

A significant motivation for the electronic work diary is the ability to use the information recorded within the diary for new and innovative management of driver fatigue. For example, unlike the written work diary an operator is able to receive real-time information on a driver's work and rest.

The NTC see no reason in restricting the ability for information to be used in new and innovative ways as long as the core requirements of the work diary under the model fatigue legislation are met. The NTC also do not see a need to mandate a different use of this information. For example, while operators are able to view information in real time with the use of in-vehicle telematics, it is not a mandatory requirement to do so. These are options for an operator to employ as they regard as reasonable steps under their general duty to manage fatigue.

In allowing further use of the information generated from an electronic work diary (for fatigue management purposes), the NTC recognises that the environment supporting the diary is now multipurpose and will potentially change over time as new uses of the data are explored. As such, this changing environment necessitates new roles that must be filled by entities. This is further detailed below.

NTC position summary

Information generated by the electronic work diary may be used for other purposes as long as the core requirements of the work diary are maintained.

6.3.7 What is an electronic work diary?

The model fatigue legislation defines an electronic work diary as any system of recording information electronically that has a label and is in a form approved by the approving authority under the approval section of the legislation. A complete list of legislative requirements for the electronic work diary is provided in Appendix B.

The approval section of the model fatigue legislation (Section 74) requires an electronic work diary to:

- indicate if it is, or is not, properly functioning
- be capable of accurately recording information under the Act
- be used by multiple drivers to record information under the Act if applicable
- have a mechanism to ensure that the driver cannot alter information once confirmed by the driver
- have a mechanism to indicate if information has (or has not) been sent to the record keeper if the information is sent to the record keeper
- be able to reproduce the information
- provide the information to an authorised officer that is readily accessible, reasonably capable of being understood and that can be used as evidence.

Further, records within an electronic work diary must be electronically transferred to a record keeper (Section 62).

These requirements, superficially, appear to be relatively simple. However, upon examining these requirements, several key concepts are revealed.

An electronic work diary is not a single device as such, but rather a system. It is a system of recording information and electronically transferring this information to a record keeper. While this may be as simple as plugging a device into a cable and pressing a button, it may also involve communication networks requiring telecommunication companies or proprietary communication networks. In the latter case, specialised ICT knowledge will be required from time to time to maintain this functionality. Smartphone users with email

connectivity will most likely be familiar with interruptions in connectivity requiring system administrator intervention and support.

The electronic work diary system must be able to indicate to the driver if it is (or is not) properly functioning. This requirement implies that the system may contain diagnostics to show it is functional. However, it may be argued that system diagnostics can never be designed to monitor every facet of a system. For example, the system diagnostics of the electronic work diary may malfunction, preventing the system from alerting the driver to a malfunction. As such, an indicator may consist of system diagnostics combined with the monitoring of the system's behaviour.

The system must allow a driver to provide their identity and authenticate this identity. If the system is used by multiple drivers to record their information, the electronic work diary system must include a process for registering a new driver to the system and, if required, deregistering a driver who is no longer using the system to record their work and rest. This is likely to require suitably trained personnel to manage the update process of the driver registrations.

The system must be able to ensure that information that has been confirmed by the driver as being correct is not able to be altered. This is a challenging requirement given the motivation by some to covert noncompliant behaviour. In an electronic environment, this process is achieved by one of two approaches. The first approach is to try to design every security feature into the initial design of the system. This is similar to the deployment approach of the digital tachograph (see Box 1). The digital tachograph has a strong security system designed to resist many forms of deliberate tampering. This is an expensive approach and may be argued as a futile effort due to the innovative nature of those who tamper. An alternative approach is to design a security architecture that is able to evolve with the evolution of threats. For example, if users of a system figure out a way to tamper with the system, the system is changed to prevent this form of tampering. This method does not try to predict every different tampering method, but rather monitor the system and adapt the protection as necessary. This form of protection involves suitably trained personnel being responsible for the monitoring and update of the system when necessary.

Box 1: What is a digital tachograph?

A digital tachograph is the digital version of the conventional tachograph system. Tachographs record time, vehicle speed and driver identity information and are used to determine the compliance of drivers to hour of service regulations.

These systems are mandated by many countries within the European Union (EU) and are now supplied as integrated components within many new vehicle sold in the EU.

The digital tachograph is a single-use instrument dedicated to its regulatory task. Information is recorded on to an on-board unit and on a driver smartcard. Roadside enforcement is performed by either interrogating the driver smartcard or via a printout from the on-board unit.

Most importantly, for an electronic diary to fulfil its core role as a regulatory instrument, the system must be able to provide evidence of the recording. Simplistically, the information within the diary must be produced by a working approved system that has not been tampered with, in which records have not been altered and that can provide a court

with sufficient confidence to believe the information presented as records from the system are a true and correct reproduction of the information recorded by the driver. This, more than any other requirement, requires suitably trained personnel to look after the system and update or rectify it where required. The frequency or steps involved in this 'looking after' process will be dependent on the complexity of the system presented for approval.

The concepts presented above also mean that an electronic work diary is not only the hardware or software but also the deployment and environment in which the hardware and software resides. This has an effect on what may be presented for approval. As the system is greater than just the hardware and software, it is unlikely that an electronic work diary system will be able to be purchased as a stand-alone approved system. It is more likely that either an operator may purchase and implement the system within their existing ICT system and apply for approval of this integration, or an operator may engage a third party to provide the complete solution and manage this on behalf of the operator.

These concepts introduce the need for new entities to be created within the electronic work diary system. These are explained further in Section 6.3.8.

6.3.8 New roles and entities

New roles are required as part of the shift from the written to electronic work diary environment. These new roles are best explained by examining the current roles within the written work diary environment and the responsibilities under these roles.

The written work diary shares the responsibility of all tasks among the roles of the approving authority, driver and record keeper.

The authority organises for the written work diary to be printed and assures its quality. It provides the premises and authorised staff to identify and authenticate the driver and the distribution channel for the driver to pay for and collect the diary. The authority manages the process for replacing the work diary and recording all necessary details linking the diary to the driver's identity.

The driver manages the in-field operation of the diary. The driver must ensure they have the diary and a pen and record their work and rest in the standardised format. The driver also ensures the records are provided to the record keeper.

The record keeper stores the driver's records and, if appropriate, reviews the records for compliance to the relevant regulations.

As discussed in Section 6.3.4, to enable the use by many different users, the records of the electronic work diary should be stored in a standard format on a standard medium. This standard medium may be considered comparable to the physical written work diary and acts as the driver's personal driver recording device. As such, a role will be required to control how many driver recording devices a driver has at any one time, to record the details of the device and the driver, to ensure the device is functional and to issue the device to the driver after authentication of the driver's identity. This role is akin to the management of the written work diary by the authority. However, as this now incorporates the management of an electronic device, the question of who performs this role is pertinent.

An electronic work diary would not be infallible. That is, like any other electronic device it would be susceptible to faults, software 'bugs' and breakdown. It may be unreasonable to expect that a driver or record keeper is suitably skilled to maintain and rectify a malfunctioning electronic work diary. Similar to the driver looking after the operation of a written work diary, the electronic work diary would require a role of 'caretaker'. This role

requires intimate knowledge of the system and is akin to the manufacturer or provider of the electronic work diary. However, in contrast to a written work diary, the skills associated with maintaining an electronic work diary are also related to the skills required to be able to tamper with the records or information contained within the electronic work diary. As such, some may argue that if an operator does have the necessary skills to manage the ongoing operation of an electronic work diary, this represents a significant risk to the data integrity of the system. Others argue that it is not practical to manipulate the data of an electronic system or that the risk of manipulation can be mitigated through auditing the system and its data. While the role of an electronic work diary provider is recognised, the question of who is allowed to perform this role is pertinent.

While the approving authority owns the specification for electronic work diaries, it is likely that the authority will not possess the skills to be able to update the specification. The update of the specification will need to be performed by a body that has detailed knowledge in its creation, its operation and its objectives. As such, there is also a need for the role of caretaker of the specification. This 'system manager' is required to manage the process of updating or modifying the specification and may be called upon to assist in the certification process, perform the certification process or train the appropriate certification bodies. This role requires intimate knowledge of the specification and regulatory requirements.

NTC position summary

The electronic work diary should require a driver recording device issuer, electronic work diary provider and system manager.

The driver recording device issuer should be responsible for the issuing process of the driver-recording device.

The electronic work diary provider should be responsible for the electronic work diary's ongoing operation and rectification of malfunctions.

The system manager should be responsible for the management, update and modification of the specification and may play a role within the certification process.

Consultation

NTC would like to consult with stakeholders regarding who could perform the roles of driver-recording device issuer, electronic work diary provider and system manager. These roles may be performed by a number of entities (such as driver, record keeper, system supplier or a combination of each), dependent on the complexity of the system presented for approval and the skills and competencies of those applying for approval. NTC would also like to consult with stakeholders on the differing factors that would allow entities to perform different roles.

6.3.9 Electronic work diary and broader regulatory telematics

The provision for an electronic work diary within the model fatigue legislation places obligations on users of systems that also form part of an intelligent transport system approved under the Intelligent Access Program Act.

In stating this, it should be noted that the model fatigue legislation does not require an electronic work diary to be part of the Intelligent Access Program (IAP), nor does it require any driver or operator who wishes to use an electronic work diary to participate in the IAP.

The IAP is a voluntary program that provides heavy vehicles with access, or improved access, to the Australian road network in return for monitoring of compliance with specific access conditions by in-vehicle telematics solutions.

The IAP has been designed to maximise the ability for information generated from the in-vehicle telematics equipment to be used as credible evidence within a court prosecution.

As such, some parallels between the IAP and an electronic work diary system may be drawn. Many of the IAP service providers may have in-vehicle telematics equipment that already meets the requirements for data security and tamper evidence required of an electronic work diary system.

The IAP contains many business rules for assessing a vehicle's compliance to access conditions that are not required as part of an electronic work diary system. The electronic work diary is principally a record-keeping system with compliance being determined at the roadside by enforcement officers or by back-office audit. As such, the IAP and electronic work diary applications are unique applications.

The specification for the electronic work diary provides the minimum requirements for an electronic work diary but not necessarily other regulatory telematics applications. For example, the electronic work diary does not require a GPS for data collection, whereas the IAP requires accurate GPS information. By setting the minimum requirements, flexibility is afforded to the operator to decide which system best suit their needs now and in the future and allows operators are able to make informed choices.

NTC position summary

The electronic work diary and Intelligent Access Program are separate regulatory telematic applications.

The Intelligent Access Program may have technology that meets requirements of the electronic work diary data protection and security components.

Setting the minimum requirements provides operators with the flexibility to decide the functionality they require now and in the future from their in-vehicle telematics.

6.4 Problem 2: Options discussion

Traditionally, the main penalty for road transport breaches has been a fine imposed by a court. Maximum fines were quite low compared with fines for other offences and this, combined with the fact that they tended only to be imposed on drivers and operators, meant that road transport monetary penalties alone have not operated effectively as deterrents.

The national Road Transport Reform (Compliance and Enforcement) Bill was approved by the ATC in 2003. The Bill introduced the chain-of-responsibility concept. This means that all parties with responsibility for activities that affect compliance with the road transport laws should be held legally accountable. In addition, the Bill contains a hierarchy of sanctions and penalties for parties that are not complying with transport laws (see Figure 2). These sanctions and penalties can be used to address noncompliance with fatigue or speed-related laws.

The compliance and enforcement reform contains five general objectives. These are:

- to improve road transport safety
- to minimise adverse impacts of road transport on roads, bridges and road infrastructure
- to minimise adverse impacts of road transport on the environment
- to minimise adverse impacts of road transport on the community
- to promote effective and efficient observance of requirements of road transport law.

These general objectives are supplemented by a range of particular objectives. These are:

- to provide a system that encourages effective and efficient compliance with requirements of road transport law
- to provide a system that promotes improved outcomes for road safety, the environment, road infrastructure, traffic management and competitive equity through improved compliance with and accountability for requirements of road transport law
- to provide an effective, efficient and equitable scheme for the enforcement of requirements of road transport law
- to recognise a chain of responsibility of parties who have a role in the transport of goods or passengers by road and to make the parties accountable for their acts and omissions
- to confer powers to promote safety in the use of vehicles in road transport.

The administrative-based and court-imposed sanctions and penalties proposed in the Bill are intended to be effective deterrents. They have been tailored to address specific types of offenders (e.g. first-time offenders, those who might benefit from compliance supervision, ‘systematic or persistent’ offenders) and specific consequences (e.g. offences involving a risk to safety or the reaping of large commercial profits from the wrong-doing).

Used separately or, where appropriate, in combination, these new sanctions and penalties will enable the most effective sanctions strategy or strategies to be applied to the particular offender and the particular circumstances.

In describing the regulatory problem below, the discussion focuses on the supervisory intervention order sanction. A supervisory intervention order is described in Box 2. It can be called a ‘flexible’ sanction as the order can direct the offender to undertake a range of actions. These include changing management and operation practices through to reporting information on their compliance with the law.

Box 2: Supervisory intervention order

A supervisory intervention order (SIO) may be made by a court only upon application of the prosecutor or a road authority and only against a person who is found by the court to be a systematic or persistent offender. This order is intended to improve the person's compliance performance and the court must consider the likelihood of the order achieving this aim when deciding upon whether to make the order.

An SIO may direct the offender to:

- undertake acts to improve compliance, such as retraining or re-assigning staff, appointing a compliance auditor, obtaining expert advice, implementing operational changes and publishing compliance reports
- report or disclose information on compliance
- conduct specific operations subject to the direction of the authority.

The order cannot extend beyond one year. Any costs associated with implementing the order will be the responsibility of the person against whom the order is made. The order may be made either instead of any other penalty or in addition to any other penalty, other than a prohibition order.

Respondents to the consultation process of the draft position paper released in July 2009 did not provide much commentary on the need to introduce guidance material on the tools available for courts to manage fatigue and speed compliance. However, the NTC believes that for a court to be able to impose an effective sanction, the contents of the sanction must achieve the desired result. This requirement for an effective tool to manage fatigue and speed is shared by the greater transport industry.

It may be argued that under the current fatigue and speed chain-of-responsibility legislation, operators are currently obligated to look to ways to manage driver fatigue and speed compliance. An electronic work diary, once approved, becomes a tool available to courts and industry to manage fatigue compliance. Courts may, however, impose conditions above that required by the minimum specification as prescribed by the fatigue legislation. For example, a court may require an operator to operate an electronic work diary that contains assisted information of location and time recording, offering a record-keeping system with integrity gains greater than that of a written work diary.

However, because there is no current regulatory speed record-keeping system, it may be argued that the tools necessary for speed compliance for either industry or courts are lacking. In the July position paper, the NTC proposed two options to address the identified problem.

Option B1 involved maintaining the status quo and doing nothing. This is a viable option because it may be argued that courts and industry may cater for themselves in selecting the appropriate tools for fatigue and speed management. Further, with the specification for electronic work diaries, it may be argued that an operator has half of their fatigue and speed record-keeping solution. However, this process involves both the courts and industry potentially learning through trial and error and creating a costly learning curve.

Option B2 involved developing guidance material on the tools available that courts may use for fatigue and speed compliance. This option provides an option for selection by courts or industry that provides the minimum elements for a system assuring a high degree

of data integrity. Both courts and industry are not obligated to use this guidance material or may modify the material to suit their requirements. As such, the NTC recommends that option B2 most appropriately addresses problem 2.

6.5 Option B2: Develop guidance on tools available for courts for fatigue and speed management

A court has the ability to impose an SIO upon application of the prosecutor or a road authority and against a person who is found by the court to be a systematic or persistent offender. An SIO may direct the offender to undertake acts to improve compliance including imposing electronic on-road compliance monitoring. However, such a sanction will only be an effective measure if the electronic on-road compliance monitoring is effective in collecting and providing the information to the operator.

It may be argued that using electronic on-road telematics equipment does not in itself prevent a driver from becoming noncompliant, but rather provides the information of the noncompliance explicitly to all parties within the chain of responsibility.

To achieve this for fatigue compliance, the electronic work diary specification may need some modifications to prevent traditional false declarations from being made by the persistent offender.

To achieve this for speed compliance, a speed-monitoring specification is needed. The development of the specification then allows industry and courts to be aware of the currently unrecorded information of the driver.

6.6 Modification of the electronic work diary specification

As stated in the introduction to this section, the benefit of imposing electronic on-road telematics equipment is to explicitly provide information of the driver's action to entities within the chain of responsibility.

The entities within the chain of responsibility are then required to take reasonable steps to assure the compliance of their drivers.

However, this premise is based on the information being collected from the electronic work diary containing a factual representation of the driver's actions. In the case of systemic or persistent offenders, it may be argued that a self-declaration facility will not provide accurate information.

As discussed in Section 6.3.3, the minimum requirements within the specification do not require the electronic work diary to automatically assist in the declaration of work and rest. This feature may not be acceptable for a court-imposed order because the information under this regime alone allows the driver to self-declare information in the same manner they have done with the written work diary. Further, courts may wish to impose that reports of the drivers' work and rest are provided to the operator in real time.

Once accurate information is collected using an electronic work diary, adequate protection is provided for the information to be used as credible evidence.

NTC position summary

The electronic work diary is an available tool for courts and industry to use for fatigue management compliance.

For court-imposed sanctions, the electronic work diary should:

- contain automatic data capture for time and location
- provide reports of noncompliance in real or near real time to the entities within the chain of responsibility.

6.7 Speed-monitoring specification

Similar to the principles presented for an electronic work diary, the speed-monitoring system should meet a number of requirements to ensure it delivers appropriate data integrity and protects this information such that it may be used as credible evidence for the prosecution or defence of an offence. However, unlike a work diary application, driver speed compliance is absolutely linked to the vehicle speed compliance and as such the application is somewhat simpler to envisage.

The following sections detail the NTC position on the features of a speed-monitoring telematics application suitable to be used as a tool for either courts or industry to manage speed compliance.

6.7.1 Data capture

Speed information within a speed-monitoring system must make use of some sort of automatic data capture. While there are many different ways that the vehicle speed may be captured, the most practical and tamper-evident way is the use of a GPS.

GPSs allow speed capture to occur without any integration with the vehicle. Many systems that integrate to the vehicle as part of speed-limiting systems have been found to be ineffective against malicious tampering. Further, GPSs are relatively tamper evident as due to their 'closed' nature, attempts to tamper quickly cause the system to show unexpectedly low self-reported data quality.

GPSs are also capable of supplying speed measurements on configurable intervals with a minimum interval of one second. This flexibility allows an accurate representation of the vehicle's movement and speed while providing the ability to balance communication costs. Further, GPSs allow the position of the speed measurement to be easily determined. This will be necessary for operators to determine compliance of a driver's speed in speed zones below the state maximum.

NTC position summary

The speed-monitoring system should use a global positioning system for the generation of speed and be accurate.

The speed-monitoring system should generate information regularly.

6.7.2 Driver identification and authentication

Core to a driver speed-monitoring system is the identification of the driver. Similar to the requirements under Section 6.3.2, the identification and authentication method should meet a minimum standard that is akin to a driver's signature.

Driver's identification must incorporate enough information to uniquely identify the driver of the vehicle. This will require the driver's name, licence number and licence-issuing state or territory.

To ensure that the correct driver is driving the vehicle, drivers should be required to identify themselves each time the vehicle is turned on.

NTC position summary

Speed-monitoring systems should contain a method of identification and authentication consistent with the standard of the driver's signature used within the written work diary.

The method of identification and authentication should identify the driver by name, licence number and license-issuing state or territory.

Drivers should be required to identify themselves each time the vehicle is started.

6.7.3 Data integrity

Since information in a speed-management system may be required to act as evidence of a driver's actions, it is critical that the system provides a high level of data integrity.

The integrity of the data capture is discussed in Section 6.7.1. However, the system must offer protection of the data post capture. As such, designers of the system should maximise the ability for the speed information to be used as credible evidence.

Unlike the electronic work diary, speed monitoring incorporates monitoring the driver and the vehicle. It is therefore important that the in-vehicle equipment is not able to be removed from the vehicle, preventing the vehicle from being 'monitored'.

Last, like any monitoring device, for it to be effective it will need to be reliable and suitable for its environment.

NTC position summary

Speed-monitoring systems should assure the integrity of data post capture.

The speed-monitoring system should be mechanically tethered to the vehicle such that attempted removal is at least evident.

Speed-monitoring systems should be designed to maximise the ability for speed information to be used as credible evidence.

Speed-monitoring systems should provide a highly reliable and robust environment for driver record keeping.

6.7.4 Roles and responsibilities

Like the electronic work diary system, responsibility for the operation of the system is shared among several roles. In a speed-monitoring system, the driver will need to identify

and authenticate themselves to the system and an operator must receive the information of the driver's actions.

However, beyond this the roles of speed-monitoring system provider (akin to the electronic work diary provider) and system manager are applicable. These are explained in detail in Section 6.3.7.

NTC position summary

The speed-monitoring system will require a speed-monitoring system provider and system manager.

The speed-monitoring system provider should be responsible for the speed-monitoring system's ongoing operation and rectification of malfunctions.

The system manager should be responsible for the management, update and modification of the specification and may play a role within the certification process.

Consultation

NTC would like to consult with stakeholders regarding who should perform the roles of speed-monitoring system provider and system manager.

6.7.5 Approval

Similar to the electronic work diary, to ensure that the requirements of the specification have been met, speed-monitoring systems for court use should be certified.

While this is not strictly required of systems selected voluntarily by industry to fulfil their obligations under the chain-of-responsibility legislation, having their systems certified allows them to demonstrate the quality of the system they have employed.

NTC position summary

The speed-monitoring system used for court-imposed sanctions should be certified.

Consultation

NTC would like to consult with stakeholders regarding who should perform the certification function of speed-monitoring systems.

7. CONCLUSION

This paper presents the NTC policy framework for approving electronic work diaries, as allowed for within the model fatigue legislation. It provides guidance on two tools that may be used by courts for supervisory intervention orders involving speed and fatigue compliance.

In developing the policy framework, the NTC have attempted to provide a set of minimum requirements that allow approving authorities to approve electronic work diaries that meet the model fatigue legislation and provide operational equivalence to the written work diary.

In providing guidance to courts on the tools that may be used for speed and fatigue monitoring, the NTC have attempted to respect the ability of courts to determine the appropriate sanctions but have attempted to provide a means of imposing a sanction that reaps the desired effect.

The NTC acknowledge that this policy framework provides only the policy and associated guideline for approval. These are complemented by the functional and technical specification developed by Transport Certification Australia on behalf of Austroads.

The result of this work will be a consistent and aligned package incorporating policy, guidance and specification elements that will meet the ATC directive and provide the basis for informed public consultation with all relevant parties. This will include obtaining a realistic estimate from the telematics industry of the costs of providing devices that meet the requirements set out in the consultation documents. This will then inform any subsequent regulatory impact statement.

The Austroads specification is a working draft for the purposes of consultation alongside this policy paper. The NTC policy was finalised and approved for release in August in time for the Standing Committee on Transport meeting in August 2010. A joint consultative process will be undertaken between Austroads, Transport Certification Australia and the NTC. As a result of this consultation, a final position will be reached that can be recommended to ministers at ATC.

The NTC also acknowledge that both industry and governments have strong views on what the requirements of the electronic work diary should be. This combined with the number of stakeholders and the related safety impact of 'getting it wrong' has led to the New South Wales Transport Minister announcing a pilot of electronic work diaries (NSW Transport 2010).

This pilot is expected to inform the policy, guideline and specifications by testing the institutional, business and operational process in recording, reviewing and enforcing an electronic work diary. The NTC expects that the working draft specification being prepared by Austroads will inform the basis of devices being used within the pilot.

While the details of the pilot have not been released at the time of writing this document, the funding for the pilot covers the next three financial years.

The NTC believes that, given the additional work being conducted by the NSW Government, a complete regulatory impact statement is premature. To be able to meaningfully provide a cost imposition the finalised institutional arrangements will need to be determined.

Considering this, the policy framework will comprise:

- a finalised version of this policy document (in order to achieve this, the outcomes from the NSW pilot will be incorporated as well as the feedback from consultation)
- a finalised version of the draft guideline presented in Appendix C
- a finalised specification detailing the functional and technical specifications for assessing electronic work diaries

- an amendment package to the model fatigue legislation to address the feedback to the consultation process and outcome of the NSW pilot and counting time provisions.

Because the finalisation of this work relies heavily on the results of consultation and the NSW pilot, the NTC are encouraging industry, suppliers and approving authorities to provide feedback, not only to the highlighted consultation questions but to all facets of the proposed policy framework. The NTC believes it is only through this consultative process that effective reform will be achieved.

APPENDIX A: NATIONAL TRANSPORT POLICY FRAMEWORK'S VISION, POLICY OBJECTIVES AND POLICY PRINCIPLES

Source: ATC 2008

Vision for Australia's transport future

Australia requires a safe, secure, efficient, reliable and integrated national transport system that supports and enhances our nation's economic development and social and environmental wellbeing.

Transport policy objectives

To achieve this vision, Australia's transport ministers commit to the following policy objectives:

- **Economic:** To promote the efficient movement of people and goods in order to support sustainable economic development and prosperity.
- **Safety:** To provide a safe transport system that meets Australia's mobility, social and economic objectives with maximum safety for its user.
- **Social:** To promote social inclusion by connecting remote and disadvantaged communities and increasing accessibility to the transport network for all Australians.
- **Environmental:** Protect our environment and improve health by building and investing transport systems that minimise emissions and consumption of resources and energy.
- **Integration:** Promote effective and efficient integration and linkage of Australia's transport system with urban and regional planning at every level of government and with international transport systems.
- **Transparency:** Transparency in funding and charging to provide equitable access to the transport system, through clearly identified means where full cost recovery is not applied.

Transport policy principles

Australia's transport policy framework is underpinned by the following guiding principles.

- **Infrastructure pricing:** sending the appropriate signals to influence supply and demand for infrastructure
- **Competitive markets:** establishing competitive markets wherever possible to minimise the need for regulation
- **Private sector:** involving the private sector, where it is efficient to do so, in delivering outcomes
- **National regulation:** a national perspective should be adopted where regulation is required
- **National markets:** encouraging national markets where possible
- **Customer:** being customer focused – equitable access for all users

APPENDIX B: HEAVY VEHICLE DRIVER FATIGUE NATIONAL MODEL LEGISLATION 2007 – RELEVANT TO ELECTRONIC WORK DIARIES

Division/section number	Division/section title
Division 1.3	How this Act applies
Subdivision 1.3.1	Regulated heavy vehicle
Section 10	What is a regulated heavy vehicle?
Subdivision 1.3.2	Who this Act applies to
Section 11	Who is a driver?
Section 12	Who are the parties in the chain of responsibility?
Section 13	Who is an employer?
Section 14	Who is a prime contractor?
Section 15	Who is an operator?
Section 16	Who is a scheduler?
Section 17	Who is a consignor?
Section 18	Who is a consignee?
Section 19	Who is a loading manager?
Section 20	Who is a loader?
Section 21	Who is an unloader?
Subdivision 3.1.2	Counting time
Section 40	Counting time, including work and rest time
Division 4.2	Work diary requirements
Section 56	Driver must carry work diary
Section 57	Information that driver must record in work diary
Section 58	How driver must record information in work diary
Section 59	Destroyed, lost, stolen or malfunctioning work diaries
Section 60	Malfunctioning odometers
Section 61	Duty on employers, prime contractors, operators and schedulers to ensure driver compliance
Division 4.3	Records relating to drivers
Section 62	Information that record keeper must record
Division 4.4	False work records
Section 64	False entries
Section 65	Keeping 2 work diaries simultaneously prohibited
Section 66	Possession of purported work records etc prohibited
Section 67	Defacing or changing work records etc prohibited
Section 68	False representation of work records prohibited
Section 69	Making entries in someone else's work records prohibited
Section 70	Destruction of certain work records prohibited
Section 71	Tampering with electronic work diaries prohibited
Division 4.5	Written work diaries
Section 72	Form of written work diaries
Section 73	Issue of written work diaries
Division 4.6	Electronic work diaries
Section 74	Approval of electronic work diaries
Section 74A	Labelling of electronic work diary devices
Section 75	Variation or cancellation of approval – on application
Section 75A	Removal of electronic work diary approval label
Section 75B	Authority may permit the use of diaries whose approval has been cancelled
Section 76	Variation or cancellation of approval – without application
Section 76A	Notice of variation of approval
Section 76B	How electronic work diary to be operated

Section 76C	Admissibility of documents produced by an electronic work diary
Division 5.2	Exemptions
Subdivision 5.5.2	Other exemptions
Section 92	Work diary exemptions
Section 93	Applying for an exemption
Section 94	Granting an exemption
Section 94A	Driver must carry exemption
Division 6.2	Enforcement powers
Section 107	Powers of authorised officers or police officers in relation to fatigue and work/rest hours breaches
Section 109	Duty on officers to annotate driver's work diary
Division 7.2	Who may make a decision
Section 113	Authority may delegate powers
Division 7.3	Referral and mutual recognition of decisions
Section 115	Referral of matters to the Panel

APPENDIX C: DRAFT GUIDELINES FOR ELECTRONIC WORK DIARIES

Introduction

Electronic work diaries can be used by drivers of heavy vehicle as an alternative to the paper-based written work diary in Australia. Electronic work diaries need to be approved by government before they can be used. These guidelines describe this approval process and provide further details about what electronic work diaries are assessed against in this process.

These guidelines will be useful to those seeking to have an electronic work diary approved, technical experts making an assessment of an electronic work diary, and government staff assessing the application.

The key principles used in assessing an electronic work diary is it should, at a minimum, meet all legislative requirements and be operationally equivalent to the written work diary.

To be able to fairly assess applications, Austroads have commissioned Transport Certification Australia to develop functional and technical specifications for an electronic work diary. This guideline makes reference to this specification.

Applying to get an electronic work diary approved

The overall process is:

Step 1. The applicant shall contact the intended approving authority for

- a. an application form
- b. a copy of the functional and technical specification
- c. a list of approved certification bodies.

Step 2. The applicant shall then contact the certification body that they intend to engage to perform the functional and technical assessment of the applicant's electronic work diary. Each certification body shall have their own process for submitting an electronic work diary and its associated documentation.

Step 3. Upon completion of the assessment of the electronic work diary submission, the certification body shall provide the applicant with a report detailing the results of the assessment.

Step 4. Upon successful completion of the assessment of the electronic work diary submission, the applicant shall contact the authority and provide the assessment report.

Step 5. The authority shall then assess the report and the submission and either approve or deny the application.

Step 1

In contacting the authority, the applicant should use this opportunity to understand the authority's requirements and ask any questions they have about the process. Applicants are encouraged to read the specification carefully to determine the necessary requirements of their system. The specification is performance-based to allow applicants to be innovative

and be accepting of the widest range of technology as possible. Questions on the specification may be clarified by the certification body.

Step 2

Each certification body can provide a copy of the functional and technical specification. Applicants are encouraged to discuss their intended submission with the certification body to determine any significant short falls in meeting the requirements.

Designers of new systems are encouraged to discuss their design with the certification body to identify any potential short falls or misinterpretation of the requirements.

The applicant should also ask the certification body about the process for making a technical submission.

Step 3

Results of the technical assessment shall be provided to the applicant in a test report. The test report will detail any features that failed to meet the minimum requirements. The applicant should be aware that the certification body will not provide advice on how to change the submission but may provide clarity on why it did not meet the requirements.

Step 4

Upon successful completion of the assessment, the applicant shall take their test report and application and submit it to the authority for approval.

Step 5

The authority shall assess the test report and application form and either approve or deny the application. If the road authority approves the application, the applicant will receive written notification and a type approval number. This type approval number will need to be labelled on the approved electronic work diary (section 74A of the model fatigue legislation).

If the authority does not make the decision sought by an applicant, the authority must also give the applicant a written notice that states the decision and the reasons for the decision. Applicants may apply to have the decision reconsidered, for example, if more information was sought in the application.

Requirements that will be assessed

The functional and technical requirements of an electronic work diary are contained within Austroads Performance-based Specification for Electronic Work Diary and Heavy Vehicle Speed Monitoring (Draft) (Austroads 2010).

Variations to approved electronic work diaries

Operators of approved electronic work diaries may continue to use the electronic work diary until the authority cancels the approval of the electronic work diary or the electronic work diary is changed.

If an electronic work diary needs to be changed, the applicant will need to contact the authority that approved the electronic work diary and may need to go through the assessment process (steps 1 to 5) again.

APPENDIX D: PROPOSED CHANGES TO THE FAP BUSINESS RULES

The following is a list of proposed changes to the Fatigue Authorities Panel rules.

Unless stated otherwise, additions are underlined.

Introduction

Under the laws that will be based on the model legislation, the Panel will have a statutory role to provide advice to jurisdiction fatigue regulators on matters referred to it relating to: accreditation for Advanced Fatigue Management (AFM); Basic Fatigue Management (BFM); and approval of electronic work diaries, principally in relation to applications intended to have application in multiple jurisdictions.

Section 1

7.1 Functions of the Panel

The Panel is to provide advice on AFM and BFM accreditation and electronic work diary approval, as provided under the fatigue legislation, including:

- (a) where a matter is referred to it for advice by a fatigue authority; and
- (b) by issuing guidelines in relation to AFM and BFM accreditation; and
- (c) by issuing guidelines in relation to technical expert certification.

Section 22

Additional dot point

- the variation or cancellation of the approval of an electronic work diary.

Section 26

Appearance by applicant, auditor or expert before the Panel

- (1) An applicant, auditor, fatigue expert or technical expert may appear before the Panel if, in the opinion of the chairperson, the appearance will be likely to assist the Panel, or if the Panel has asked that the applicant, auditor or fatigue expert appear before it.

Added sections

These sections mirror the sections for a fatigue expert.

PART 6 – TECHNICAL EXPERTS

Role of technical experts

- (1) The role of a technical expert is to provide independent expert advice to the jurisdiction on matters referred to it under rule 22(1).
- (2) The Panel may issue guidelines, not inconsistent with these Rules, to assist technical experts in the performance of their functions.

Eligibility to become a fatigue expert

- (1) Subject to this rule, the Panel may register a person as a technical expert if they are recommended for registration by a fatigue authority and, in the opinion of the Panel, the person:

- (a) has demonstrated a high level of professional expert knowledge in work-related IT systems; and
- (b) has a sound knowledge of the heavy vehicle industry; and
- (c) has demonstrated high professional and ethical standards in their field of expertise.

Examples of ways to demonstrate professional and ethical standards include:

- membership of a relevant professional body
- relevant qualifications or training in professional conduct
- research approval by an ethics committee.

- (2) The Panel must not register a person as a technical expert if the person:
 - (a) has been found guilty of an offence of dishonesty within the last 10 years; or
 - (b) is bankrupt or subject to a bankruptcy law; or
 - (c) is prevented by any illness or mental or physical disability from properly performing the functions of a technical expert.

Applying to become a technical expert

- (1) A person may apply to the Panel to be registered as a technical expert.
- (2) The application must be made in the form and manner specified by the Panel.
- (3) In considering an application by a person for registration, the Panel may require the person to do one or more of the following:
 - (a) to attend an interview with a nominee of the Panel;
 - (b) to provide any documents necessary to substantiate the person's application, including samples of their research;
 - (c) to provide references as to their competence or experience; and
 - (d) to provide any other additional information to assist the Panel to determine the person's eligibility, such as proof of employment by a suitable organisation.
- (4) The Panel may register a person as a technical expert if it is satisfied that:
 - (a) the person is eligible under rule 30;
 - (b) the person is able to perform the functions of a technical expert specified under rule 29;
 - (c) the person and their employer (if applicable) has signed and is complying with a technical expert agreement under rule 33.

Note: Registration is at the discretion of the Panel. Registration is not a guarantee of any paid work for the technical expert.

- (5) If the Panel decides to register a person as a technical expert, it must advise the person of that fact in writing.
- (6) If the Panel is not satisfied that a person is eligible to be registered as a technical expert, it must notify the person of that fact in writing within 5 business days after reaching that conclusion, and it must include in that notification its reasons for reaching that conclusion.

Sections 36–39

Where the words 'fatigue expert' appeared the words 'or technical expert' have been added.

APPENDIX E: REVIEW OF SUBMISSIONS RE: NTC DRAFT POSITION PAPER

Background

The NTC's *Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance: Draft position paper* was released in July 2009. The paper discussed options to address the absence of any approvals for electronic work diaries, as well as options to address a lack of guidance for the use of supervisory intervention orders for fatigue and speed compliance.

The paper also invited stakeholders to provide written submissions, 13 of which are available on the NTC website.

Review of submissions

Submissions in response to the draft position paper were received from the following:

Government departments:	
RTA	Roads and Traffic Authority (NSW)
DTMR*	Department of Transport and Main Roads (Qld)
DOT	Department of Transport (WA)
DTEI	Department of Transport, Energy and Infrastructure (SA)
DPI	Department of Planning and Infrastructure (NT)
DIER	Department of Infrastructure, Energy and Resources (Tas)
NZTA	NZ Transport Agency
Non-government organisations:	
ATA	Australian Trucking Association
BCA	Bus & Coach Association NSW
RHA	Road Transport and Road Safety Advocate (Rod Hannifey)
TFCA	Tasmanian Forest Contractors Association
Companies:	
FEF	Fleet Effect – a telematics company producing fleet performance technology
CCL	Circuitlink – a designer and manufacturer of digital tachographs

*The submission received from the Department of Transport and Main Roads included the views of Queensland-based transport operators.

Submissions in response to the draft position paper relate to:

- policy decisions or recommendations
- the technology and system of electronic work diaries.

All submissions are summarised under these headings.

A) Policy decisions relating to electronic work diaries

1. A clear policy direction is lacking.

The paper lacks a clear policy direction and framework, and features very little discussion on overarching policy objectives (RTA).

The NTC needs to better articulate what outcomes (e.g. road safety, compliance etc) are sought through the introduction of electronic systems for fatigue and speed monitoring (RTA).

It will be important to specify more clearly what policy position, regulatory and compliance strategies, and technical solutions are proposed for speed monitoring (RTA).

The electronic work diary system should be developed from a clear policy perspective rather than around a concern simply and solely to secure a lower impost on industry (RTA).

The ambiguity existing in the policy is impacting on the development of a specification (RTA).

QLD notes that the draft position paper does not enter into significant discussion on the issues surrounding electronic speed compliance, including what speed is monitored (DTMR).

The position paper does not readily identify the short and even long-term benefits for the various groups of heavy vehicle users and this is critical going forward (TFCA).

This debate though must be underpinned by a detailed cost–benefit analysis that takes into account various heavy vehicle users and where they (TFCA)

2. The 100 km local driving exception should be scrapped.

The original proposal from RTA NSW of a 0 km rule appears to reflect the exact solution necessary to reduce fatalities (FEF).

3. Sanctions policy will need to be reviewed for the use of electronic work diaries.

Rather than directing drivers to manipulate the accuracy of data generated by an electronic diary a better approach would be to amend the law to allow integrity of data whilst ensuring that drivers are not subject to sanction for safe behaviours (RTA).

A system where a driver would be subject to significant penalties for minor breaches where there is little safety risk would be strongly rejected (DOT).

It is important that the time-counting method adopted for electronic work diaries does not

<p>result in drivers accumulating minor work or rest hours breaches that result in severe penalties (DTEI).</p>
<p>Under the highly accurate and continuous monitoring regime made possible by electronic work diaries the sanctions policy will need to be reconsidered if the voluntary take-up of electronic work diaries is not to be jeopardised (DTEI).</p>
<p>To encourage industry involvement, it will be very important to develop a nationally accepted sanctions policy (DIER).</p>
<p>There are a number of significant policy issues and challenges which affect the uptake of electronic devices for regulatory purposes (NZTA).</p>
<p>As a matter of policy, all governments should agree to ensure that inconsequential technical breaches are ignored, provided that those breaches fall within an agreed scale and frequency (ATA).</p>
<p>The ability to monitor drivers to the second for work hours and to the km/h for speed is simply a level of scrutiny that no one else is subjected to. The new laws have made it harder to comply, easier to be punished and harshly, for simply trying to do my job (RHA).</p>
<p>I want and need to be human and occasionally make a non-safety-related error, without it costing me my job or my family the food off their table (RHA).</p>
<p>We have some concerns about increased enforcement with electronic work records while the paper system is still in use. It would be possible for any breach of working hours in the past 28 days, no matter how small, to be detected (CCL).</p>
<p>The ATA also believes that alternative time counting rules for electronic systems need to be established as part of the package recognizing electronic systems (ATA).</p>

4. Electronic work diaries that expose drivers to penalties and costs will be unpopular.

<p>There is unlikely to be any great demand from companies and drivers to introduce this technology when it can be used to rigorously enforce the existing fatigue management standards (DOT).</p>
<p>In-vehicle speed monitoring is likely to have greater acceptance and success as a management tool rather than as a means of enforcement (DOT).</p>
<p>Voluntary uptake of telematics devices such as electronic work diaries will be problematic for the heavy vehicle industry because of the highly accurate and continuous monitoring capabilities of this equipment (DIER).</p>
<p>The costs associated with implementing electronic work diaries is likely to mean that without appropriate government funding, the PWD is likely to continue as the preferred</p>

option for smaller members of the industry (BCA).

Many drivers are worried about the absolute and impersonal monitoring capability of the current GPS-based systems. If I am monitored to the level of current systems by my company, that is one thing. If I am monitored to that level by authorities and then recognize for every minor indiscretion, I will not do this job anymore. Should this level of monitoring happen, there will be no drivers left (RHA).

With an electronic system any discrepancy would be instantly apparent, and in our opinion would greatly reduce the attractiveness of the electronic systems (CCL).

5. Electronic work diaries should not be mandatory / PWDs should continue to be available.

There should be no mandatory requirement for electronic record keeping (DTMR).

PWDs should be retained (DTMR).

Compulsory electronic recording is unlikely to be acceptable under the current 'national' fatigue management regime (DOT).

Legislating the mandatory use of telematics devices is not an option unless there is operator agreement that the benefits to them are worthwhile (NZTA).

Mandating electronic work diary/telematic solutions should be avoided (ATA).

The ATA opposes the mandating of telematics (ATA).

Electronic work diaries should be an option rather than a mandated requirement (BCA).

Efforts to impose electronic arrangements onto the forest products sector of Tasmania will not be welcomed (TFCA).

TFCA certainly could not support a mandated arrangement (TFCA).

6. Electronic work diaries should be mandatory.

There are many safety and efficiency benefits of mandating electronic work diaries (FEF).

Mandating electronic work diaries is the only logical and correct action (FEF).

The objective should be to eliminate the PWD altogether and to mandate an electronic work diary as the way forward. This would reduce the workload on the driver and simplify the training to Enforcement Officers (FEF).

The solution with the quickest implementation period is to define a minimum near-IAP telematics platform, with the additional requirements of a driver-identification method (FEF).

7. Legislative changes are required.

A regulatory system needs to incorporate features to ensure high levels of reliability, data quality and tamper evidence and be backed by relevant legislation (RTA).

For the system to function as intended the roles, responsibilities and obligations of all parties (e.g. third-party service provider, approval authority, transport operator, driver etc) in relation to the approval and operation of the system must be set in legislation. This will ensure that there are serious, enforceable penalties if a party does not meet its obligations or intentionally breaches an operating condition (RTA).

The RTA is strongly concerned that the NTC appears to be proposing to resolve problems that this legislation will pose for successful use of electronic work diaries by avoiding or 'working around' those issues rather than by directly addressing and resolving them (RTA).

Rather than directing drivers to manipulate the accuracy of data generated by an electronic diary a better approach would be to amend the law to allow integrity of data whilst ensuring that drivers are not subject to sanction for safe behaviours (RTA).

It is preferable that legislative amendments are made that recognize the features of electronic systems (RTA).

The law should also ensure that drivers are not subject to sanction for safe behaviour that will be recorded (RTA).

Requirements should also apply to record keepers, to ensure they cannot tamper with the information post-capture (RTA).

Despite the position paper indicating a review of the system is outside the scope of the paper there will not be any significant industry acceptance of electronic diaries until this occurs (DOT).

The current laws are designed for logbooks (RHA).

We would suggest that given the accuracy of electronic monitoring that work/rest time be recorded to the nearest second rather than in 15-minute blocks (CCL).

8. There should be a single application process and technology for IAP and electronic work diary.

TCA has been engaged to develop specification which can be integrated with the current

IAP specification (RTA).
The IAP model is built on the premise of roles enshrined in legislation, and the same approach should be taken for fatigue and speed (RTA).
Building electronic work diaries on the IAP framework by adding fatigue and speed modules may reduce costs for currently enrolled IAP operators (RTA).
Acceptable future regulatory standards for an electronic work diary are likely to be closely aligned with the requirements laid down in the IAP legislation (RTA).
There should be a single application process and technology for IAP and electronic record keeping (DTMR).
The logical solution is to use the existing IAP platform with all its jurisdiction interfaces and existing four Service Providers to allow the electronic work diary systems to be made available (FEF).
The discussion paper assumes the IAP is a third-tier system sitting well above possible future regulatory standards for an electronic work diary (RTA).

9. Electronic work diaries should be separate to IAP.

IAP may be a useful tool for courts who have to deal with very serious repeat offenders, where a high risk of repeat offending and a severe risk potential exist (ATA).
The ATA recommends that the use of a more robust monitoring tool like IAP be limited to part of court-imposed penalty options (ATA).

10. Electronic monitoring technology needs to bundle regulatory and other functions.

Only where electronic monitoring includes a bundle of regulatory arrangements in a way that provides direct savings for an operator, will there be significant uptake (NZTA).

11. Guidelines for the approval of electronic work diaries should be developed.

It is not clear if the guidelines are being developed to complement the specification TCA is developing or if they act as a replacement (RTA).
QLD supports the immediate development of guidelines (DTMR).
SA supports the development of guidelines to approve electronic work diaries (DTEI).

Guidance material to allow electronic work diaries to be approved should be developed (DIER).

The ATA recommends development of a national framework for regulations which recognise, encourage and support adopters' technology including telematics systems (ATA).

The key would be in ensuring the guidelines on the system requirements are sufficiently detailed and structured (DOT).

12. Linking electronic work diaries to supervisory intervention orders may make operators reluctant to adopt electronic work diaries.

Operators may be reluctant to adopt the technology when it is perceived to be a form of punishment (DOT).

[DOT] do have doubts about the concept of supervisory intervention orders (DOT).

13. Commercial systems are different to regulatory systems.

The paper assumes that commercial and regulatory requirements are the same (RTA).

The paper assumes that commercial electronic systems have the equivalent evidentiary standard to the manual work diary (RTA).

Whilst commercial systems are useful for a business management perspective, it is unclear that they will be suitable for use in a regulatory context (RTA).

14. Commercial systems should be recognised as electronic work diaries.

Recognising an operating free-market solution is usually very cost effective for regulators and industry alike (ATA).

15. Speed monitoring is economically unfeasible.

It is probable that the costs of mandating electronic speed monitoring for enforcement purposes would greatly exceed the benefits (DOT).

16. Speed and fatigue are inextricably linked.

Better compliance with fatigue requirements will push some operators to look to speed to gain competitive advantage (RTA).

B) The technology and system of electronic work diaries

1. Electronic work diaries must be functional enforcement tools.

The paper is not clear on how electronic work diaries would impact on the enforcement task (RTA).

From a regulatory perspective, there is a need for common data presentation standards and formats (RTA).

An electronic work diary system would need to make information easily accessible to compliance officers (DOT).

Electronic work diaries must meet a standard that ensures that the information they produce is easily accessible by roadside enforcement (DTEI).

2. Electronic work diaries require GPS technology.

The paper is not clear on whether telematics/GPS devices are required (RTA).

3. Electronic work diaries must be tamper evident/tamper proof.

A regulatory system needs to incorporate features to ensure high levels of reliability, data quality and tamper evidence and be backed by relevant legislation (RTA).

Work arounds being proposed by the NTC would fundamentally allow drivers to 'tamper' with automatically recorded data (RTA).

It is critical that the system incorporates tamper-evident mechanisms (RTA).

Evidence suggests that [speed limiter] devices are easily and regularly manipulated by those operators unwilling to comply (RTA).

An electronic work diary system would need to be tamper proof (DOT).

Electronic work diaries must meet a standard that ensures that the information they produce is tamper evident (DTEI).

4. Electronic work diaries must have strong security.

The system has to have a high level of integrity and robustness (RTA).

A regulatory system needs to incorporate features to ensure high levels of reliability, data quality and tamper evidence and be backed by relevant legislation (RTA).
If the system replaces a written diary and is subject to on-road scrutiny by compliance officers it would require a high level of security and should not be approved otherwise (DOT).
An electronic work diary system would need to be secure (DOT).
Any arrangements must be both user-friendly and secure at the same time (TFCA).

5. Electronic work diaries must produce accurate information.
The system has to have a high level of integrity and robustness (RTA).
A regulatory system needs to incorporate features to ensure high levels of reliability, data quality and tamper evidence and be backed by relevant legislation (RTA).
This paper discusses the driver being able to confirm and change any data. This may reduce the integrity of the data recorded by allowing the driver to change any information that was otherwise recorded by an automated feature (RTA).
Electronic work diaries should not compromise the safety benefits afforded by the Heavy Vehicle Driving Fatigue model legislation (DTMR).
Electronic work diaries must meet a standard that ensures that the information they produce is accurate (DTEI).
[There is] desirability for [the] specification to allow for recognition of a wide range of technologies with minimum functionality equivalent to the PWD (DTMR).

6. Electronic work diaries must be no more onerous than PWDs.
Electronic work diaries should be optional, and no more onerous than the PWD system (ATA).
Electronic work diaries should not provide a barrier to entry or adoption by virtue or imposing a higher standard than would otherwise apply under the legislated minimum (ATA).
Better fatigue management systems must not expose operators and drivers to more onerous duties, obligations or potential offence outcomes (ATA).
The ATA accepts the core elements of the paper work diary need to be replicated in and electronic system (ATA).

7. **Electronic work diaries must protect automatically generated information.**

This paper discusses the driver being able to confirm and change any data. This may reduce the integrity of the data recorded by allowing the driver to change any information that was otherwise recorded by an automated feature (RTA).

It is critical that any information automatically generated by an electronic work diary system is protected and cannot be altered (RTA).

Electronic work diaries must be able to deliver the same (if not better) level of data integrity and protection afforded by the existing PWD (DTEI).

8. **Electronic work diaries should function alongside other systems.**

The electronic work diary specification should facilitate interoperability between different technologies (DTMR).

The affect of electronic work diaries on Vehicle Monitoring Devices (VMDs), Public Transport Information and Priority System (PTIPS), bus duress alarms and other GPS technologies needs to be examined before any final decision is made for electronic work diaries (BCA).

9. **Electronic work diaries should be available to small as well as large operators.**

Electronic work diaries should include a wide range of technologies (DTMR).

Electronic work diaries should cater to the different requirements of small and large operators (DTMR).

10. **Electronic work diaries would need to know the speed zone.**

Speed zones would need to be loaded into the system (DOT).

11. **In-cab printers should not feature in an electronic work diary.**

Under no circumstances should in-cab printers be allowed in the electronic work diary requirements (FEF).

12. **The PWD is strong on protecting the data once it is entered.**

The paper work diary has high integrity post capture (RTA).

The paper-based work diary is not user friendly, it has been largely driven by a desire to provide enforcement certainty (ATA).

13. Current commercial systems are not suitable for electronic work diaries.

The argument that commercial electronic systems are sufficient for regulatory compliance purposes is not persuasive (RTA).

14. A national fatigue and speed database should be established.

The development of a national database to share information on fatigue and speed-related offences for Chain Of Responsibility purposes should be considered (RTA).

15. Roles within an electronic work diary system.

The paper infers that all information generated from a commercial electronic system can be used as evidence in the prosecution of an offence and thus commercial systems are sufficient for regulatory compliance purposes. However, commercial systems have been shown to be unreliable and vulnerable to tampering and the evidentiary quality of the information generated by these systems is questionable (RTA).

Using TCA as the certification and auditing body for fatigue and speed monitoring systems would also resolve any issues surrounding independent assessment of applications (RTA).

The lack of a clearly defined approval process may also impact the time taken to have operational electronic systems in the near future (RTA).

16. Certification of electronic work diary suppliers.

A costly complicated approval system should be avoided to ensure a competitive range of service providers can enter the market (DOT).

We would support a supplier certification system that is significantly less expensive than the current IAP one (CCL).

The technology providers should present their equipment for certification (DOT).

17. Identity management within an electronic work diary system.

As an interim measure, identity management could be managed in house by companies through a mechanism of their choice (e.g. driver's license, passwords etc) and validated

by a third party (e.g. TCA) via an accreditation process (RTA).

A system must be directly linked to a driver. If further identification is required at random times once on the road the accuracy is further enhanced. This type of approach is found with alcohol interlock devices (DOT).

18. Proposed transitional period for existing commercial systems.

A transitional period could reflect the standard operational life of existing commercial systems (RTA).

Transitional arrangements could be put in place to allow operators time to upgrade their commercial systems to comply with the performance specifications and legislative requirements of an electronic monitoring regime (RTA).

It is vital that a transition pathway be developed for the implementation of standards to ensure those operators using legacy systems which may not initially meet the standards identified, are not immediately disadvantaged (DOT).

Legislative recognition should support existing systems which provide the required outcomes (ATA).

TFCA would consider supporting the creation of a suitable transitional scenario providing it was accompanied by the implementation of government-funded incentive grants (TFCA).

19. Electronic work diaries require 'smart' in-cabin hardware.

Given that compliance can go back 28 days the system would need to be secure and readily able to identify breaches that have occurred over that period (DOT).

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