Transport Certification Australia

NSW Freight and Ports Strategy

Submission

March 2018

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Document Details

Title	NSW Freight and Ports Strategy – Submission
Document Number	TCA-B096
Version	0.1
Version Date	March 2018
Printing Instructions	Single-sided, colour

Document History

Version	Date	Description
1.0	March 2018	Final

Contents

1 INTRODUCTION

TCA is pleased to make a submission to the NSW Freights and Ports Strategy in relation to Section 2.8 – Technology "Transport is a technology business".

As articulated in the draft Strategy, the demand for freight is driven by:

- A combination of economic, spatial and behavioural factors
- The capacity, availability, and cost of transport
- The organisation of logistics systems and supply chains[1].

TCA appreciates the challenging and important task the NSW Government has in optimising the management of freight movements on the road network, and to deliver improved productivity, efficiency and safety outcomes.

TCA supports the goal of the strategy to improve the strategic transport information that is available to decision makers.[2]

In short, there is an opportunity to further leverage the *National Telematics Framework* – beyond its current use by Transport for NSW and Roads and Maritime Services – to contribute to the objectives of the Freight and Port Plan.

Specifically, the investments made by Australian governments over the last decade in the *National Telematics Framework* means that new applications can be deployed at marginal cost – without needing government or industry investments to implement stand-alone technologies which deliver prescribed outcomes (this represents a similar platform approach to the way smartphone 'apps' are supported on a common platform, allowing apps to be activated and deactivated on an individual's phone).

1.1 TCA'S Submission

This platform approach presents significant opportunities for policy makers to deliver strategy and policy through technology – rather than having technology driving outcomes.

TCA's submission consists of five parts:

- Increase access for freight across the road and rail network
- Facilitate the introduction of freight technologies that reduce freight costs and impacts
- Ensure safe, efficient and sustainable freight access to places
- Other opportunities to use data to improve freight performance by providing input into the sophisticated systems that manage network operations and prioritise traffic movements
- How TCA has worked with the NSW Government.

TCA's submission aims to highlight how telematics applications – administered through the *National Telematics Framework* – can contribute to the objectives articulated in the NSW Government's Freight and Port Strategy.

In addition, the submission includes appendices consisting of information about:

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[1] See: - https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Draft-NSW-Freight-and-Ports-Plan.pdf

[2] See:- https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Draft-NSW-Freight-and-Ports-Plan.pdf,page 5

- TCA
- The *National Telematics Framework*
- Parallels with other operational framework

TCA welcomes the opportunity to further engage with TfNSW on the NSW Freight and Ports Strategy.

2 INCREASE ACCESS FOR FREIGHT ACROSS THE ROAD AND RAIL NETWORK

2.1 Introduction

TCA acknowledges that the NSW's Government direction for this priority is to improve the reliability of freight movements by providing greater access to the shared road and rail networks, with measures such as:

- Expanding the road and rail network to improve connectivity and accessibility for high productivity vehicles and efficient rail wagon loading
- Exploring the implementation of dedicated freight lanes on key freight corridors on the strategic road network, outside of peak periods, to help to improve safety and support efficient, reliable freight movements.

There are a number of applications already administered through the *National Telematics Framework* which can enable increased access for freight on the NSW road network.

These applications include:

- Intelligent Access Program (IAP) application
- On-Board Mass (OBM) application.

2.2 Intelligent Access Program (IAP) application

The IAP is a certified telematics application which ensures 'the right truck is on the right road, at the right time'.

The IAP is a certified telematics application oversighted by TCA.

Heavy vehicle operators can obtain the IAP from an open market of certified service providers.

The IAP has been used to enable higher productivity access arrangements that would not have otherwise been possible.

Road agencies and regulators apply the IAP as a condition of access for specific types of loads and/or vehicle types.

According to RMS:

IAP provides restricted access and over dimension/mass vehicles with improved access to NSW's road network. In return, their compliance with approved access conditions is monitored using satellite-based tracking technology. This provides Roads and Maritime Services and the community with greater assurance that the right heavy vehicles are operating on the right roads.

A national productivity and safety reform

In May 2008, the former Australian Transport Council (ATC) agreed that the IAP be seen as 'a preferred compliance and vehicle management solution and that jurisdictions consider a positive approach to timetabling IAP applications where it could assist improving safety, transport

services, and asset management with respect to heavy vehicle operations, including bus services'.

The ATC also noted that the jurisdictions established the IAP as a compliance 'tool' to provide greater compliance assurance in relation to the road freight sector for use as appropriate.

At its November 2008 meeting, the ATC called for the development of an Australian performance-based specification for electronic heavy vehicle speed and driver fatigue systems, enhancing the use of in-vehicle telematics and adding value to the Intelligent Access Program (IAP).

This directive has led to the development of a national, performance-based specification and operating environment for Electronic Work Diaries (EWDs), which draws upon core elements of the IAP, tailored to address the policy challenges of driver fatigue and heavy vehicle speed.

Use of the IAP in New South Wales

The NSW Government has used the IAP to manage road access conditions for specific vehicle loads and/or configurations in New South Wales.

The IAP enables controlled access to the road network:

- Vehicles operating at Higher Mass Limits (HML) (including quad axle group combinations)
- B-triple and AB-triple combinations
- Modular B-triples operating at General Mass Limits (GML) on and east of the Newell Highway or operating at HML
- Vehicles operating under Performance Based Standards (PBS) Access Level 2B or above
- Vehicles operating under the Safety, Productivity & Environment Construction Scheme (SPECTS)
- High-risk mobile cranes.

As at the end of January 2018, there were a total of 4,475 vehicles were monitored in the IAP throughout Australia.

Of these, there were 2,928 vehicles monitored in the IAP in NSW – more than any other jurisdiction.

(It should be noted that IAP-monitored vehicles from other jurisdictions are monitored if they travel on New South Wales roads – regardless of whether vehicles are monitored against specific road access entitlements set by RMS. This means that insights into the safe operation of vehicles can be derived from data derived from a larger population of vehicles than the 2,928 vehicles monitored against a New South Wales-specific access entitlement).

There are significant opportunities to expand the use of the IAP application, which in 2018 remain unrealised.

As highlighted during the NTC Review of the IAP in 2013-14 (and Part 3 of this document) – only half of the access reforms identified in the NTC's Regulatory Impact Statement (RIS) for the IAP have yet been implemented by road managers and regulators. Key access reforms which were earmarked in 2005, and are yet to be made available, include:

- Dangerous Goods Vehicles monitoring
- Heavy tow truck management
- Pick and carry cranes
- Over-dimensional loads
- Low Loaders

- Additional Mass (beyond HML).

There are no technical or operational challenges in implementing these reforms. The ability to do so rests entirely with policy makers.

2.3 On-Board Mass (OBM) application

The management of mass and mass loadings of vehicles is a contributing factor to the safe operation of heavy vehicles.

Commonly known as weigh scales or mass systems, OBM Systems are able to measure the axle group mass and gross vehicle mass of heavy vehicle combinations.

The OBM application delivers three levels of assurance for the OBM application – depending on the needs of policy makers and industry users.

During 2017, TCA released the On-Board Mass (OBM) System Functional and Technical Specification. The Specification contains performance-based outcomes for the accuracy, integrity, and performance of OBM which can satisfy the needs of both industry and government.

The Specification was informed by operational deployments of commercially-available OBM Systems linked to the IAP in New South Wales and Queensland.

The OBM application can be used in three ways:

- Self-assessment
- Type-approval
- Certification.

Self-assessment

Stakeholders can self-assess conformance with the OBM application:

- **Heavy vehicle operators and end-users** can benchmark existing systems, or be better informed when procuring OBM Systems
- **Suppliers** of OBM Systems can benchmark their existing products.

Type-approval

Suppliers of OBM Systems can obtain type-approval of their OBM System/s by TCA.

Type-approved OBM System will offer transport operators and end-users the assurance that OBM Systems have been independently verified by TCA through the type-approval process.

This will allow transport operators and end-users with the ability to obtain greater assurance in the use of OBM Systems, where the measurement of mass is a key requirement to conform with the Mass Management Module of the National Heavy Vehicle Accreditation Scheme (NHVAS) and to demonstrate conformance that mass limits are being met for other parties along the supply chain (chain-of-responsibility).

Since introducing the availability of type-approval of OBM Systems in mid-2017, TCA has received five type-approval submissions from OBM Suppliers.

Type-approved OBM Systems are expected to become available during 2018.

Certification

TCA is currently implementing a new certified service offering for OBM Systems.

The certified OBM application will provide a further level of assurance, beyond what is provided by type-approval.

TCA certification of OBM System will provide the highest level of assurance required for mass information to meet public policy objectives for regulatory purposes, internal business and/or contractual requirements of a transport operator or end-user.

This assurance will be provided by having a higher level of confidence in the accuracy and reliability of the mass information collected, including when it is not being collected because of malfunction, miscalibration or potential tampering.

Just as importantly, the certified OBM application will link mass information to other key pieces of data, including the configuration of the vehicle, its location and time of collection, and, when required, its speed. This means that mass information is not only more reliable and available but contextually aligned with other key pieces of information, allowing for richer use.

The ability to link mass information to other parameters is a cornerstone of the *National Telematics Framework*, as is the interoperable, scalable and secure platform that has been developed by governments for public and private policy usage. The different levels of assurance available through the OBM application is diagrammatically represented in the following diagram

TCA is currently implementing a new OBM Program.

The OBM Program will provide the highest level of assurance in the collection and use of mass information.

Mechanisms are being incorporated to identify malfunctions, miscalibration or potential tampering.

OBM data will be linked to other data collected through the IAP (including location, time, configuration and vehicle speed) – providing the three critical ingredients to advance the next wave of productivity reforms.

2.4 IAP and OBM have enabled changes in the way road infrastructure is utilised

During 2017 updates were made to the Australian Standard for bridge assessment (AS 5100.7:2017). The updated standard incorporates *reduced* traffic load factors for vehicles monitored through the IAP and OBM for the Ultimate Limit State (ULS).

AS 5100.7:2017 is the national standard for assessing bridge infrastructure, and forms part of the national Bridge Design series.

AS 5100.7:2017 highlights how the availability of reliable and accurate vehicle location, mass and configuration information – provided through the IAP and OBM – can enable improved productivity outcomes.

This allows road managers to make access decisions which can increase mass loadings of heavy vehicle combinations. The updated standard also notes that load factors can be further reduced, provided a vehicle speed limit is specified.

This recognises how heavy vehicle speed can be monitored through the IAP, which allows road agencies to impose low-speed speed restrictions (as needed) on bridges, and to receive reports (based on the GPS measurement of speed).

2.5 Examples of how productivity reforms have been enabled through the National Telematics Framework

There are a number of examples of how productivity reforms have been enabled through the *National Telematics Framework*, as follows.

Higher Productivity Freight Vehicles (HPFVs) – Victoria (73t Quad-Tri and 77.5t Quad-Quad B-Doubles)

HPFVs were introduced in 2013, under the Victorian Government's 'Moving More With Less' policy.

HPFVs are longer than standard B-Double combinations and are:

- Performance Based Standards (PBS) approved
- Up to 30m in length
- Monitored through the IAP for route and speed compliance (maximum of 90km/h)
- Fitted with TCA type-approved OBM Systems.

These vehicle combinations are able to operate on parts of the road network that were not previously available.

The 'Moving More With Less' policy has put downward pressure on the number of trucks operating on Victorian roads by facilitating the use of ore efficient vehicle combinations on approved roads.

Safety, Productivity and Environment and Construction Transport Scheme (SPECTS) – New South Wales

SPECTS was introduced in 2016.

SPECTS allows for 'general' (unrestricted) access to vehicles operating at Higher Mass Limits (HML) axle loads, which would otherwise be subject to restricted access (with over 140 bridge restrictions in the Sydney region).

Transport operators are eligible to participate in SPECTS if vehicles are:

- Approved as a Performance Based Standards (PBS)
- Monitored through the IAP for route and mass (using OBM Systems)
- 140+ bridge restrictions in Sydney have been removed (only 1 bridge restriction remains) – based on the assurance available to road agencies by known the location and mass of vehicles.

SPECTS was introduced with the aim of reducing the number of vehicle movements across Sydney, which is being increased as a function of a major increase in infrastructure investment and construction.

Super Quad Road Trains – Western Australia

Super Quad Road Trains were introduced in 2015.

Super Quad Road Trains have a payload of 140 tonnes (198 tonne GCM), and are:

- Performance Based Standards (PBS) approved
- 60m in length
- Monitored through applications of the National Telematics Framework for:
    - Route compliance
    - Speed compliance (maximum of 90 km/h)

- ‘Headway’ compliance (minimum of 200m between Super Quad Road Trains travelling in convoy – allowing other vehicles to overtake on a road with a signposted speed limit of 100 km/h)
- Overtaking compliance (Super Quad Road Trains are not permitted to overtake another Super Quad Road Train).

Super Quad Road Trains were introduced as an economic reform to improve the viability of mining sites (i.e. by reducing the cost of transport costs between mining sites and port) which extract minerals and metals for export.

PBS A-Doubles - Queensland

PBS A-Double combinations operating between Toowoomba and the Port of Brisbane were introduced in 2011.

PBS A-Double combinations are able to operate up to 85 tonne Gross Vehicle Mass (GVM), are:

- Performance Based Standards (PBS) approved
- Monitored through applications of the National Telematics Framework for:
  - Route compliance
  - Speed compliance (maximum of 90 km/h)
  - Mass compliance.

The use of OBM Systems, combined with location monitoring (through the IAP application) and speed monitoring (through the ISC application), have allowed load factors on bridges to be reduced from 2.0 to 1.6 – based on the assurance provided by having visibility of location and mass data (consistent with section 2.4).

PBS A-Doubles between Toowoomba and the Port of Brisbane has generated significant productivity and gains for the export of grain to international markets, by halving the number of heavy vehicle movements required for a given freight task.

3 FACILITATE THE INTRODUCTION OF FREIGHT TECHNOLOGIES THAT REDUCE FREIGHT COSTS AND IMPACTS

TCA acknowledges that NSW’s Government direction for this priority Action Area is to create new opportunities to improve the customer experience, efficiency, and the sustainability of the freight transport system by facilitating the introduction of technology.

Through the investments made by government and industry over the last decade, over half the articulated heavy vehicle fleet now have telematics devices fitted – which are able to support current and future uses of telematics – without incurring additional costs.

The National Telematics Framework ‘platform’ provides opportunities that would otherwise be possible with traditional, stand-alone technology approaches.

The following outlines telematics applications available through the *National Telematics Framework* that can deliver the objectives of the NSW Freights and Ports Strategy:

- Traveller Information Exchange
- Route Guidance Application
- Real-time alerts application
- On-demand access to telematics data application
- Other future applications (uses) of telematics devices already fitted to heavy vehicles.

Each application is underpinned by common:

- Data elements (consistent with the telematics data dictionary, as depicted in the diagram below)
- Communication protocols
- Security
- Legal agreements between TCA, certified service providers and transport operators
- Hardware requirements for in-vehicle devices and systems.

It is important to note that, because of these common elements, each of the applications available through the *National Telematics Framework* can now be used by nearly 40,000 prime movers already fitted with telematics devices recognised through the *National Telematics Framework*. (Noting that 40,000 prime movers represent around half of the articulated heavy vehicle fleet in Australia, there are no costs to transport operators (or government) to activate and utilise these applications).

3.1 Traveller Information Exchange

The Traveller Information Exchange enables information from multiple sources to be made available to drivers, by telematics providers, via in-vehicle devices

Despite the growth in the availability of information from multiple sources and locations, this information is not always provided in ways that can be easily accessed or able to benefit users of the road network.

The transport and logistics sector has long been calling for better access to information along the supply chain, to improve productivity, efficiency, and safety.

To this end, TCA is currently working with road agencies, ports and other facilities to incorporate further information sources, such as road data, empty container park queue information, variable speed limits, and emergency information.

The Traveller Information Exchange has been built to allow data to be shared in a common language – consistent with the Telematics Data Dictionary managed by TCA – so that all systems can access and distribute information.

The first use of the Traveller Information Exchange is to distribute information made available by the Port of Fremantle.

The Traveller Information Exchange facilitates timely delivery of this information directly to drivers to improve supply chain processes and avoid unnecessary congestion at the port. The driver receives the information in-cab through their on-board telematics system, integrated with other services. Leveraging the Port's Congestion Management System (CMS - FPA operates the CMS to provide electronic messaging to drivers via electronic signs at the port precinct) operating within the port precinct, delivery of messages through the Traveller Information Exchange to in-cab systems will enable drivers to make informed decisions about their schedule while en-route to the port, thus improving traffic management and alleviating potential congestion around and within the vicinity of the port.

TCA has been working with the Port of Botany (and other Ports around the country) to obtain similar information for use through the Traveller Information Exchange.

This application provides a key point of access for real-time information to optimise road freight productivity, efficiency and safety.

3.2 Route Guidance Application

The route guidance application enables telematics providers to offer turn-by-turn directions to heavy vehicle drivers based on vehicle load, dimensions and configuration, as well as other parameters such as time of day.

The route guidance application relies on the provision of road attribute data from road and transport agencies.

VicRoads was the first to make road attribute data available for use through the Route Guidance Application, setting the benchmark for other road agencies to follow.

TCA has been working with RMS to obtain road attribute information available for the New South Wales road network so that the route guidance application to be offered to heavy vehicle drivers in New South Wales.

The open technology market of providers is actively seeking this road attribute data from New South Wales, in response to customer demand.

However, at the time of writing, road attribute data from RMS is yet to be made available.

This application has the potential to offer significant productivity, efficiency and safety improvements.

3.3 Real-time alert Application

TCA is currently implementing real-time alerts to be made available through the *National Telematics Framework*.

Real-time alerts can increase the identification of high-risk events associated with specific drivers, vehicle types, and/or vehicle loads, where an immediate response or intervention is required by road agencies/regulators.

Based on the outcomes of consultation with road and transport agencies across the country, it is anticipated that real-time alerts will be reserved for the most serious policy and operational risks.

- Candidate uses of real-time alerts identified by road and transport agencies relate to:
- The safe operation of heavy vehicles
- Risk management of the interaction between heavy vehicles and physical infrastructure

This reflects the following two dimensions which appear to influence the focus of stakeholders within road and transport agencies:

- Key risks on the road network are disproportionately skewed towards the operation of heavy vehicles
- and
- There is a greater population of heavy vehicles already fitted with telematics devices that can enable the activation of real-time alerts.
- The availability of real-time alerts presents the NSW Government with opportunities to identify and respond to immediate safety events.

3.4 On-demand access to telematics data application

TCA is currently implementing a new application through the National Telematics Framework for road agencies and regulators to obtain access to telematics data (as and when required) for safety management and compliance purposes.

Critically, road agencies and regulators need assurance that by accessing data later, the accuracy and integrity of data are maintained. Assurance is also demanded that data is stored securely and not able to be alternated, manipulated or destroyed.

The availability of on-demand access to telematics data presents the NSW Government with opportunities to trigger requests for data, as and when required, to support audits and investigations which relate to the operation of heavy vehicles.

4 ENSURE SAFE, EFFICIENT AND SUSTAINABLE FREIGHT ACCESS TO PLACES

TCA acknowledges the direction for this Priority Action Area is to ensure an efficient, safe and effective freight network to meet the need of NSW'S growing cities, balancing the growth of the freight task with the broader safety, environmental and amenity objectives for the transport network.

As such there are opportunities available that the NSW Government can access immediately through the National Telematics Framework.

4.1 Opportunities to expand the use of the IAP application

The use of the IAP by governments to manage productivity and safety has not been adopted as widely as originally anticipated.

In referencing the Regulatory Impact Statement (RIS) developed by the NTC for the IAP in 2005, TCA's submission to the NTC Review of the IAP in 2013 pointed to the implementation status of access arrangements.

In the five years since the review, there have been no new access entitlements which have significantly driven demand for the IAP.

Demand for the IAP is a function of the incentives (or removal of disincentives) from government authorities/regulators to encourage users to opt-in to regulatory telematics applications (in a voluntary environment).

As highlighted during the NTC Review of the IAP, only half of the access reforms identified in the 2005 RIS have yet been implemented.

The lack of incentives (or removal of dis-incentives) to promote the use and adoption of telematics applications in a voluntary environment (and a perceived lack of leadership (or interest) from 'government' to drive adoption) is a key barrier to wider adoption of the IAP.

Managing compliance through the IAP

TCA's Members rely on the data collected through the IAP to manage compliance and enforcement activities for non-compliant activity recorded through the IAP.

A submission from TfNSW to the National Transport Commission (NTC) in 2013 stated:

The application of the IAP to these vehicles is to ensure they only travel on roads assessed as suitable and hence approved for their configuration, providing greater compliance assurance to

RMS, other road managers and the wider community to sustainably manage the state's road assets and road safety.[3]

Similarly, in 2014 TfNSW claimed:

Transport for NSW considers that the collection and publication of data relating to safety compliance, payload and route information will allow transport agencies to develop safer and more productive transport systems for the heavy vehicle industry.[4]

Road agencies have reported that the IAP has been an effective compliance tool. The program has effectively reduced reported non-compliance among participating vehicles through education and communication rather than a traditional enforcement approach. Furthermore, the IAP has provided road authorities with the assurance that the right vehicle is operating on the approved network. Road authorities have indicated that the IAP has enabled controlled access for higher productivity vehicles on the road network. Channelling high risk and heavy vehicles to appropriate routes have reduced the impact of heavy vehicles on the local community, other road users and the environment. [5]

There is a widespread understanding that IAP-monitored vehicles generate electronic exception-based reports (which are received by RMS) which can be used to execute a range of constructive compliance measures (including prosecutions).

During the 2016-17 financial year, TCA issued 18 sets of certificates of evidence, which enabled IAP records to be used as prima facie evidence that offences have been recorded. The majority of these certificates were prepared on behalf of RMS, to progress court action against transport operators found to be non-compliant with road transport law through the IAP.

4.2 Intelligent Speed Compliance (ISC)

ISC is a certified telematics application to manage vehicle speed.

ISC can be applied as a monitoring condition to transport operators and/or specific vehicles as specified by road agencies and regulators.

Heavy vehicle operators can obtain ISC from an open market of certified service providers.

Road agencies and regulators use ISC to manage excessive vehicle speed.

ISC generates electronic reports whenever a monitored vehicle is detected speeding. Furthermore, automatic reports are also generated if there is a malfunction or tampering is detected.

As a regulatory telematics application – with high levels of accuracy, integrity, security and oversight-reports generated by the ISC application can be used in a similar way to images and records generated by speed cameras, for speed compliance and enforcement.

Background

The ISC application was originally introduced in 2012, in response to calls from TCA's Members for a 21st-century approach to monitoring heavy vehicle speed to:

- Supplement traditional approaches to managing speed compliance

3 https://www.ntc.gov.au/Media/Reports/(BD70319C-88ED-CA93-E1A6-E560471A0E1D).pdf

4 https://www.ntc.gov.au/Media/Reports/(AC428EA5-EE3B-42D6-8978-8ED9AE5FEA65).pdf

5 https://www.ntc.gov.au/Media/Reports/(969A07AB-745D-49C7-9DB2-2D5249230978).pdf

- Provide a secondary line of defence for speed limiter malfunctions or tampering (which may otherwise go undetected)
- Utilise certified telematics as a supervisory intervention to monitor vehicles (or vehicle fleets) with a poor history of speed compliance.

As a regulatory telematics application administered within the *National Telematics Framework*, the ISC application provides the necessary levels of accuracy, integrity and security in measuring vehicle speed for compliance management purposes.

A key aspect of ISC is that it offers certificate-based evidence (in the same way as the IAP does), which allows TCA's Members and other regulators to rely on the data derived from the ISC application for enforcement and prosecution purposes.

Use case examples

In Queensland and Western Australia, ISC is used to monitor and enforce the maximum permissible speed of heavy vehicles.

In these jurisdictions, ISC has been used to manage compliance with maximum speed limits applied to specific heavy vehicle combinations and/or loads.

In each of these examples, the ISC application is used in conjunction with road access monitoring through the IAP application.

When linked to the IAP, ISC is used in conjunction with heavy vehicle access conditions and the legislative provisions contained in the Heavy Vehicle National Law(HVNL).

These same arrangements can be implemented immediately in New South Wales at zero cost.

Furthermore, the NSW Government can elect to use ISC as a stand-alone instrument or coupled with road access conditions monitored through the IAP.

Enhancements to the ISC application

TCA is introducing three enhancements to the ISC application:

- Low Speed Guidance (operational and available) for low speed thresholds (<40 km/h) (available now) – policy use example: providing access to infrastructure that necessitates low speed travel including shared vehicle pedestrian areas, school zones, or heavy vehicles traversing vulnerable structures
- Unique maximum speed thresholds which can be applied to the individual boundaries of each State and Territory (*available during Q1 2018*) – policy use example: setting jurisdictionally specific speed requirements
- Spatially-defined speed limits allowing specific speed thresholds (>40km/h) to be applied to geographic areas/zones or road lengths (*currently being implemented*) – policy use example: road works, speed zones in CBD areas and townships, restricted speed zones for heavy vehicles (e.g. steep decline).

4.3 Intelligent Speed Management (ISM)

Intelligent Speed Management (ISM) is a set of operating requirements necessary to accurately measure vehicle speed using Global Positioning System (GPS)-enabled telematics devices and systems.

TCA developed ISM in response to issues about the perceived accuracy (and inaccuracies) of telematics devices for speed management and reporting purposes.

Any transport operator which utilises telematics systems that reference GPS – or an alternative Global Navigation Satellite System (GNSS) – to monitor vehicle speed can benefit from ISM.

Unless appropriately configured (in line with ISM requirements) there can be significant differences in the way telematics systems measure and report speed.

Although the heavy vehicle industry drove the need for ISM operating requirements (as a way to manage their chain-of-responsibility obligations) TCA is aware that ISM is now being used across telematics applications to measure and report vehicle speed.

Transport operators and other parties can utilise ISM as a way to assist in the management of chain- of-responsibility obligations, by gaining assurance through the accurate measurement of vehicle speed.

ISM is different to ISC, as it:

- Is not a certified telematics application which is operationally oversighted by TCA
- Does not automatically report speeding events to road agencies/regulators
- Does not detect malfunctions or possible tampering.

Despite this, ISM provides a means for transport operators to better utilise GNSS capabilities to accurately measure speed in their vehicles

5 OTHER OPPORTUNITIES TO USE DATA TO IMPROVE FREIGHT PERFORMANCE BY PROVIDING INPUT INTO THE SOPHISTICATED SYSTEMS THAT MANAGE NETWORK OPERATIONS AND PRIORITISE TRAFFIC MOVEMENTS

The availability of the *National Telematics Framework* provides a means for the NSW Government to better understand – through analysis of aggregated, de-identified telematics data – to better understand heavy vehicle road use patterns and trends, and to assist in forward infrastructure investment plans.

A data culture should recognise the outputs (analytical work, and policy and business decisions that draw on them) are only good as inputs.

The following components which form part of the *National Telematics Framework* enable the NSW Government to analyse telematics data in a standardised, common format – overcoming the traditional challenges (and costs) associated with the collection of data:

- From multiple data sources
- Which contains different data elements
- Is of different accuracy, integrity and quality.

Telematics Data Dictionary

In response to a request from Australian Transport Ministers, TCA released a Telematics Data Dictionary that establishes a common set of definitions for the use and exchange of data and information.

The Telematics Data Dictionary aligns with national and international frameworks and standards including the *National Telematics Framework*, the Policy Framework for Intelligent Transport Systems in Australia and global International Standards Organization (ISO) standards.

The Telematics Data Dictionary is intended to be primarily used by developers. Implementers and maintainers of telematics applications who can align the data formats used in established applications with the Dictionary.

In this age of interoperability and savvy end-users, who are accustomed to multi-use devices, there is a greater appreciation and expectation that telematics and related intelligent technologies are able to run multiple applications (including regulatory and commercial applications) – consistent with the principles of *National Telematics Framework*.

Conformance with the Dictionary not only enables multiple applications to operate from a single system or service but can promote interoperability across other systems.

Telematics Analytics Platform

It is widely recognised that telematics data represents a transformation in the way Member agencies can manage road networks.

Although there may be specific policy or operational needs to activate telematics applications, the power of aggregating data – which can be derived from multiple telematics applications, and across a large population of vehicles – provides new opportunities to optimise:

- Traffic management
- Manage infrastructure
- Identify risks.

The *National Telematics Framework* provides the platform which facilitates:

- Minimum requirements about what data needs to be collected, at what level of accuracy
- Data elements
- Communication protocols
- Security.

Telematics applications that rely on the data being ‘pulled’ (or data being accessed ‘on demand’), means that road agencies and regulators need to have assurance that data is available when required.

This means some level of oversight of telematics provider performance is required (although, depending on the policy and operational objectives of individual telematics applications, full end-to-end oversight – which enables the provision of high-integrity, certificate-based evidence of data – may not be necessary).

Having assurance that data can be accessed when and if required is a key requirement sought by TCA’s Members in having on-demand access to telematics data.

The expanded of the Telematics Analytics Platform (TAP) – which provides a centralised location from which to receive data from telematics providers supporting current and future telematics applications enabled through the *National Telematics Framework* – coupled with an appropriate level of oversight by TCA, may provide a suitable model to provide Members with assurance that data will be available ‘on demand’.

The TAP also provides a means for Members to view and obtain access to data, consistent with the terms of each telematics application, and the agreed use of data – as disclosed by road agencies and regulators to participants (registered operators) upon enrolling vehicles into the application.

6 HOW TCA HAS WORKED WITH THE NSW GOVERNMENT

TCA has worked closely with RMS and TfNSW – and in conjunction with other government stakeholders and heavy vehicle industry participants – to advance the use of telematics to improve road productivity efficiency and safety

Key examples of include:

- Smart rest area initiative
- Using certified telematics for dangerous goods vehicles
- Analysis of telematics data to analyse container movements in Sydney
- Heavy Vehicle Usage Data Project
- Proposed use of telematics to manage landside efficiencies at Port Botany.

6.1 Smart rest area initiatives

TCA worked with TfNSW during 2013 to develop a 'smart rest area' initiative which could provide information to heavy vehicle drivers about the availability and occupancy of rest areas.

The initiative was intended to leverage the outcomes of the Operational Pilot of EWDs, which identified the value of providing 'in-cab' advisory warnings to drivers to provide information on their next rest period(s).

The availability of 'smart rest areas' takes this concept further, enabling rest areas to communicate in real-time to telematics devices, allowing drivers to benefit from knowing a combination of the following:

- Information about their next designated rest period(s)
- The next available rest area
- The current availability of parking spaces at the next available rest area
- The provision of alternative rest area locations (if there are limitations on the availability of parking at the next rest area).

TCA worked with TfNSW and RMS to implement a smart rest area trial, but information is not currently supplied through the *National Telematics Framework* (for use through the Traveller Information Exchange).

The provision of rest opportunities for heavy vehicle drivers is seen as a critical element in managing driver fatigue and reducing the incidence of road accidents.

A common complaint from the transport sector and heavy vehicle drivers is that insufficient parking and poor facilities prevent access to or discourage the use of certain rest areas.

The provision of rest area information through telematics can provide drivers with better access to real-time information to plan their trips and manage fatigue.

6.2 Using certified telematics for dangerous goods vehicles

Following the fatal crash involving a dangerous goods vehicle in Mona Vale on 1 October 2013, the then NSW Minister for Roads and Ports, the Hon Duncan Gay MLC, requested an assessment of mandating the use of the IAP on dangerous goods vehicles.

TfNSW and RMS were directed to work with the Road Freight Industry Council (RFIC) and the National Heavy Vehicle Regulator (NHVR) to investigate the utilisation of the IAP for this purpose.

TCA also worked with TfNSW and RMS in providing advice on the use of certified telematics applications to improve the management of dangerous goods vehicles through the *National Telematics Framework*.

6.3 Analysis of telematics data to analyse container movements in Sydney

TCA is currently undertaking a piece of work on behalf of TfNSW to gain a better appreciation of container vehicle movements on specific key freight routes within the Greater Sydney Region by using Intelligent Access Program (IAP) information for research purposes – in accordance with the National Heavy Vehicle Law (HVNL).

TfNSW intends to use the outcomes of this analysis to:

- Improve its understand container freight movements from Port Botany to other locations in Sydney
- Identify opportunities to further advance land-side optimisation strategies
- Inform policy options for the wider introduction of higher productivity vehicle configurations in the Sydney metropolitan area.

TCA understands that further, similar analysis of telematics data is planned by TfNSW.

More broadly, this work demonstrates the capabilities of the *National Telematics Framework* to offer data insights capability not previously available to policy makers.

6.4 Heavy Vehicle Usage Data Project

The Heavy Vehicle Usage Data Project is currently being undertaken by TCA, Austroads and the Bureau of Infrastructure, Transport and Regional Economics (BITRE)

The project is intended to support:

- Road planning and investment making decisions
- National reform initiatives, such as the ongoing development of the national key freight routes map and the heavy vehicle road reform.

The objectives of the project are to:

- Develop an efficient and accurate method of collecting and reporting heavy vehicle usage data collected through the use of in-vehicle telematics
- Provide governments with an aggregated and de-identified sample of heavy vehicle road usage data for key freight routes
- Maintain a positive relationship with industry stakeholders to facilitate ongoing sharing of heavy vehicle usage data.

As part of the project, TCA is currently analysing 53 key freight roads located in NSW.

TfNSW and RMS are both represented on the project.

6.5 Proposed use of telematics to manage landside efficiencies at Port Botany

In 2016, TCA prepared strategic advice in response to a RfQ (for the procurement of a technological system capable of collecting, monitoring and reporting on supply chain interface movements across various points of the Sydney, Port Kembla and NSW supply chain) presented by TfNSW, consistent with TCA's role and function and presented TfNSW with the opportunity to:

- Leverage the *National Telematics Framework*, and the ability to utilise type-approved Telematics In-Vehicle Unit (IVU) already installed in over 40,000 heavy vehicles across Australia
- Obtain analytical reports from TCA, by utilising the Telematics Analytics Platform
- Work with Service Providers certified by TCA which offer applications through the *National Telematics Framework*, to facilitate the data collection and reporting outcomes sought by TfNSW.

TfNSW had indicated that, prior to receiving TCA's response to the RfQ, it was planning to adopt a traditional procurement model which – based on other responses received from technology providers to the RfQ – would have led TfNSW down the path of adopting a proprietary technology. Such an approach would not have been able to leverage the *National Telematics Framework*, nor the availability of type-approved Telematics IVUs already installed in heavy vehicles operating at Port Botany.

TCA proposed to TfNSW that a work package be developed to formally progress this work during 2017-18. In mid-2017, TCA was advised by TfNSW that the procurement process was placed on hold and other avenues were being explored within the department.

This is a missed opportunity and TCA would be pleased to re-engage with TfNSW moving forward.

7 OPPORTUNITIES FOR THE NSW GOVERNMENT

Governments have made investments in the *National Telematics Framework* 'platform' over the last decade to encourage the take-up of telematics.

The heavy vehicle industry has responded adopting telematics systems in significant numbers, which has been influenced by the availability of the Framework.

This investment means that policy makers can activate new initiatives without:

- Governments needing to develop 'bottom-up' or 'stand-alone technical solutions
- Incurring unnecessary investments and expenditure of public funds
- Forcing additional, unnecessary costs onto transport operators (and other stakeholders).

The following initiatives can be actioned immediately by TCA, in conjunction with the NSW Government, to improve the movement of freight on New South Wales roads:

- Obtain data from RMS for use in the *Traveller Information Exchange* (in conjunction with data from other sources) – so that heavy vehicle operators and drivers can obtain live information through telematics devices, including rest area availability and occupancy information.
- Obtain road attribute data from RMS for use in the *Route Guidance application* – so that drivers can be offered turn-by-turn directions to stay on approved roads in New South Wales
- Continue working RMS in progressing *Real-time alerts* to provide necessary assurances to stakeholders. Alerts can be sent to RMS when dangerous goods vehicles are travelling

towards, or have entered, sensitive or restricted area (for example, tunnels) and/or to emergency personnel if a dangerous goods vehicle is involved in a crash

- Encourage the use of the Telematics Analytics Platform and utilise the OBM Program when it becomes operational and available.

There are no costs to governments in utilising the applications available through the *National Telematics Framework.* Furthermore, new applications (to meet specific road freight challenges) can be developed and activated at marginal cost. It is important to note that, because of these common elements, each of the applications available through the *National Telematics Framework* can now be used by nearly 40,000 prime movers already fitted with telematics devices recognised through the *National Telematics Framework*. (Noting that 40,000 prime movers represent around half of the articulated heavy vehicle fleet in Australia, there are no costs to transport operators (or government) to activate and utilise these applications).

8 APPENDIX A: ABOUT TCA

This section provides information about TCA and the organisation's role and function, a description of the term 'telematics' and the *National Telematics Framework*.

8.1 Overview

TCA is the national, government-appointed body responsible for providing assurance in the use of telematics and related intelligent technologies.

TCA supports government agencies and regulators by providing programs and services that are outcome-focused, technology agnostic, disruption-resilient. TCA programs and services address the security requirements and privacy concerns of users, providers and government; encourage innovation, and facilitate appropriate private sector contribution to the costs of regulation.

The use of telematics and related intelligent technologies – including C-ITS and Connected and Automated Vehicle (CAV) applications – advance surface transport productivity, safety and compliance outcomes.

TCA's role and function is to administer applications of telematics and related intelligent technology on behalf of Australian road and transport agencies, as well as other agencies/regulators.

Governments rely on TCA to represent their interests when developing and implementing policy reforms which depend on the use of technology.

TCA's functions and services (Advice, Accreditation and Administration services) now span across the following public policy domains:

- Management of an Open Technology Market (through the *National Telematics Framework*, which is a digital and business platform for use by governments and industry sectors)
- Heavy vehicles
- Public transport (buses and ferries)
- Taxis, hire cars and ride sharing
- Safety-based technologies for road safety (light vehicles)
- Connected and automated vehicles (light and heavy vehicles)
- Road transport network management.

TCA derives its powers from different instruments linked to policy sectors, including:

- Ministerial policy decisions
- Legislation and regulations
- Guidelines
- Approval powers granted by TCA's Members and/or other organisations.

TCA's origins were in heavy vehicle reforms which were dependent upon the use of telematics to advance productivity and safety outcomes for Australian Governments.

To this end, the initial focus of TCA was to introduce the first regulatory telematics application – the Intelligent Access Program (IAP) – to improve the management of heavy vehicle productivity and access.

8.2 What is telematics?

The term 'telematics' refers to integrated systems of information, communications and sensors to exchange data and information between vehicles and other locations, including:

- Vehicle to infrastructure (V2I) applications
- Vehicle to vehicle (V2V) applications
- Vehicle to elsewhere (V2X) applications.

Telematics is increasingly being used across surface-based transport – and in particular heavy vehicles, to improve safety, productivity and efficiency outcomes.

Telematics enables:

- The monitoring and reporting of vehicles and infrastructure
- Information to be sent to and from vehicles
- The implementation of Connected and cooperative vehicles
- The implementation of Automated and autonomous vehicles.

8.3 TCA's role and function

Australian Governments increasingly depend on the use of telematics and related intelligent technologies to deliver public purpose outcomes across surface transport modes[10].

TCA's role involves the interaction of three distinct stakeholder groups to deliver improved public outcomes:

- Government agencies (which set policies in relation to the use of telematics to regulate end-users)
- Regulated end-users (which use telematics applications in response to government policies)
- Private sector service providers (the technology and Intelligent Transport System (ITS) sector, which deliver telematics products and services to regulated end-users to conform with government policies).

TCA is responsible for ensuring the use of telematics meets the accuracy, integrity and security needs of stakeholders.

Road agencies rely on TCA to confirm the evidentiary standard of telematics data so that court-based compliance and enforcement actions can be initiated.

TCA performs a key role in avoiding:

- Potential *market failures*, such as proprietary-based systems inhibiting inter-operability, or technology applications which impact the safety of road users

  and

- Potential *regulatory failures*, such as unintended technology prescription, or poorly constructed policy positions which could lead to duplication and inconsistencies.

There is no other entity – government or private – which performs TCA's role and function.

8.4 Governance

TCA is the national government body responsible for providing assurance in the use of telematics and related intelligent technologies.

TCA was established in 2005 to deliver nationally consistent outcomes in the use of telematics devices, services and applications.

TCA's Members are the road and transport agencies representing each State and Territory Government, and the Australian Government. In New South Wales, TCA's Member is Roads and Maritime Services (RMS).

TCA is governed by a Board of Directors, consisting of senior representatives appointed by each Member.

Mr. Bernard Carlon, Executive Director, Centre for Road Safety, Transport for NSW (TfNSW), is the New South Wales representative on the TCA Board.

9 APPENDIX B: THE NATIONAL TELEMATICS FRAMEWORK

The investments by governments and the technology sector in the *National Telematics Framework* should not be underestimated.

It has provided a stable platform from which stakeholders (government, the technology sector and end-users across multiple industries) now take for granted.

Examples of how the *National Telematics Framework* has parallels with other operational frameworks in other portfolios and industry sectors is contained at Appendix C.

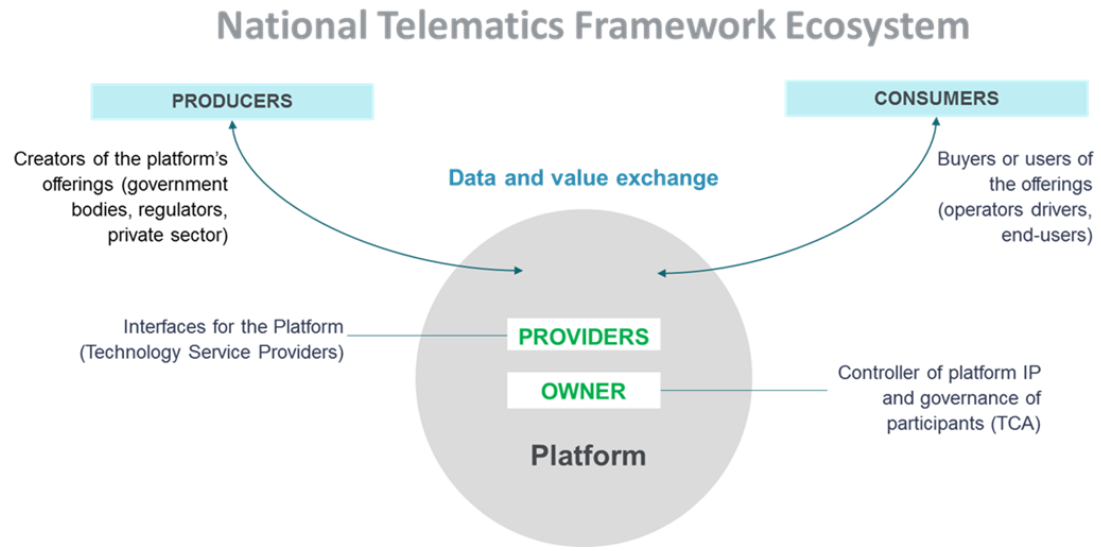
A casual observation of other regions (internationally) demonstrates the pitfalls of having fragmented governmental and industry approaches to telematics, which do not benefit from a common 'operational framework/platform' which not only supports multiple programs and applications but encourages innovation, competition and choice.

The lack of framework has resulted in greater costs being incurred by government and end-users, with many vehicles needing to be fitted with stand-alone, single-purpose hardware and devices which duplicate functions.

In Australia, the availability of the *National Telematics Framework* has enabled half of the articulated heavy vehicle fleet to be fitted with TCA type-approved telematics devices, which are able to support any number of applications administered through the *National Telematics Framework* (including those available now, and those in the future).

This outcome demonstrates how the heavy vehicle industry has elected to purchase telematics hardware which has the requirements necessary to support regulatory telematics applications – even if the transport operator does not have a need or use for regulatory applications today.

This is a strategically important development and provides significant opportunities for government policy makers, as well as across industry sectors.



The above figure highlights the platform relationships of which the four entities are as follows (the text in italic customises the traditional 'platform business model' terminology to that of the *National Telematics Framework* ecosystem):

- **Producers** are the creators of the platform's offerings (including public policy owners or commercial entities) – in the *National Telematics Framework* ecosystem, **producers** are government bodies, regulators and private sector entities that create applications that address public and private policy initiatives
- **Consumers** are the buyers or users of the offerings – in the *National Telematics Framework* ecosystem, **consumers** are operators, drivers, and end-users of light and heavy vehicles
- **Providers** offer the interface for the platform that interfaces to deliver services – in the *National Telematics Framework* ecosystem, **providers** are type-approved suppliers, certified service providers and (as applicable by the level of assurance adopted – see section below) non-certified service providers
- The **Owner** is the controller of the platform intellectual property and the governance of who may participate and in what ways – in the *National Telematics Framework* ecosystem, the **owner** is TCA.

9.1 Benefits of a Digital Business Platform

The *National Telematics Framework* and its associated common infrastructure and rule set delivers:

An **open technology market**, which can sustainably deliver upon the needs of government, industry and end-user consumers, ensuring choice while delivering the latest developments at increasingly lower costs:

i) It allows governments a more contemporary procurement model for both regulatory and contractual services where it is not re-inventing the wheel every time it wants to acquire or take advantage of a digital transformation. In doing so it appropriately allocates risk to different entities – governments take policy responsibility as opposed to being responsible for the end to end solution and its associated upkeep

ii) Enables a shift from 'resource control' (a traditional pipeline business model concept) to 'resource orchestration'. In a platform environment, it is the network

of **producers** and **consumers** that create and use the assets, as opposed to one organisation controlling resources and market structures to minimise movements of consumers.

Consistency and certainty to providers and end-user consumers, so that government's functional expectations can be relied upon to make both investment and adoption decisions:

i) Adheres to the Policy Framework for ITS in Australia ensuring a performance-based approach enabling innovation

ii) Nearly half of the articulated heavy vehicle fleet in Australia now have a TCA type-approved Telematics IVU. **Consumers** (i.e. transport operators) have purchased the equipment for their own purposes, while government benefits by being able to easily implement new applications

iii) Provides an explicit privacy by design approach recognising the challenges associated with personal information in the digital economy

iv) Provides data for research purposes that allows both public and private outcomes well beyond that of the purpose of any one application.

9.2 What does the National Telematics Framework consists of?

The *National Telematics Framework* consists of the following inter-related instruments, to enable the operation of a digital business platform:

- A library of **functional and technical specifications** (which translate policy objectives into performance-based outcomes to be met by providers of telematics and related intelligent technologies)
- A **telematics data dictionary**, and common data elements across all specifications (to ensure inter-connectivity and inter-operability, to support any number of current and future applications)
- **Approval**, **type-approval** and **certification** and **re-certification** processes (for providers of telematics and related intelligent technologies – where TCA oversight is required by government and industry)
- **Governance frameworks** to grant (and cancel) **type-approvals** and **certifications** (managed on behalf of road and transport agencies, and other government agencies as required – where TCA oversight is required by government and industry)
- **Legal instruments** to manage (and protect) the relationships between TCA, certified service providers, suppliers of type-approved hardware, systems and devices, and end-users – where TCA oversight is required by government and industry
- **Institutional and governance frameworks** to **manage privacy** requirements, to ensure the use of data collected through telematics and related technologies is used only for disclosed purpose
- **Operational administration** of applications of the *National Telematics Framework* (managed on behalf of road and transport agencies, and other government agencies as required – where TCA oversight is required by government and industry
- **Audit programs** (managed on behalf of road and transport agencies, and other government agencies as required – where TCA oversight is required by government and industry
- **Legislation** to support specific regulatory programs of the *National Telematics Framework.*

10 APPENDIX C: PARALLELS WITH OTHER OPERATIONAL FRAMEWORKS

Examples of operational frameworks which deliver public outcomes in other portfolios

The efficient operation of any well-functioning market is derived from the interaction of laws, institutional arrangements, policies, administrative practices and business rules, which provide guidance and confidence to all stakeholders.

The *National Telematics Framework* provides an example of how a well-functioning market can advance:

- Public outcomes sought by governments, industry sectors and the community (including productivity and safety reforms enabled through the use of telematics)

  together with
- Private interests of individuals and organisations (in pursuing business outcomes through the use of telematics).

The *National Telematics Framework* has demonstrated the ability support competition and innovation in a formalised, structured environment.

The operation of the *National Telematics Framework* is comparable with, and has direct parallels to, other operational frameworks administered by government agencies where there is an identified need to:

- Deliver public outcomes in a specific policy area, or legislative objective
- Manage interactions between different stakeholders to achieve outcomes
- Achieve a balance between public and private interests.

The following table aims to highlight that, despite the differences in policy areas and contextual parameters, there are distinct similarities between the *National Telematics Framework* with other operational frameworks administered, managers and or supervised by other government agencies.

Notably, the table highlights three distinct parallels in:

- The instruments used, and activities performed by, administrators of frameworks
- The provision of operational oversight, reporting and corrective mechanisms to manage the functioning of frameworks
- The delineation of roles and responsibilities of different stakeholders within frameworks (with three key types of players: administrators/regulators, providers of services, and receivers of services).

These three interrelated elements, when administered within an agreed operating framework, deliver assurance to stakeholders – both to providers *and* receivers of products and services.

Policy area	Media and communications	Finance	Health	Energy	Intelligent Transport Systems (ITS)	
Outcome	To deliver a communication and media environment that balances the needs for industry and the Australian community with regulation, education and advice. (*ACMA website*)	To establish and enforce prudential standards and practices designed to ensure that, under all reasonable circumstances, financial promises made by institutions we supervise are met within a stable, efficient and competitive financial system (*APRA website*)	To regulate Australia's health practitioners, in the public interest (*AHPR website*)	To regulate the wholesale and retail energy markets, and energy networks (*AER website*)	A safe, secure, efficient, reliable and integrated national transport system that supports and enhances our nation's economic development and social and environmental well-being (*Policy Framework for ITS in Australia*)	
Responsible agency	Australian Communications and Media Authority (ACMA)	**Australian Prudential Regulation Authority (APRA)**	Australian Health Practitioner Regulation Agency (AHPRA)	Australian Energy Regulator (AER)	**In-vehicle ITS (telematics)**	**Road-side ITS**
					Transport Certification Australia (TCA)	Road and transport agencies

Policy area	Media and communications	Finance	Health	Energy	Intelligent Transport Systems (ITS)	
key instruments / activities	Legislation Regulations Standards Codes of practice Licensing (including class licences) Type-approvals Compliance management Administration and management of spectrum	Legislation Regulations Prudential standards Guidance notes Prudential practice guides Supervision of banks, building societies and credit unions, life and general insurance and reinsurance companies, friendly societies and super funds.	Legislation National Boards (for specific heath profession categories) Administration n and management of the National Registration and Accreditation Scheme Accreditation standards, registration processes, legal agreements, audits, monitoring and	Legislation Business rules Monitoring Investigation Reporting Compliance Assessing applications from businesses that want to become energy retailers.	Legislation Functional and technical specifications Certification Type-approvals Legal agreements Administration and management of telematics services Application of business rules, performance standards, audits, monitoring and compliance	
Examples of operating framework/s	Digital radio regulatory and licensing framework Spectrum licensing technical framework	Authorised Deposit-taking Institutions (ADIs) Prudential Framework General Insurance Prudential Framework Superannuation Prudential Framework Private Health Insurance Prudential Framework Cross Industry Prudential Framework	Quality Framework for Accreditation Audit framework for nursing and midwifery	National Energy Framework	*National Telematics Framework*	

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