



# Submission 25 - iMOVE - National Transport Regulatory Reform - Public inquiry

iMOVE CRC submission to the Productivity Commission

iMOVE



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## Foreword

This document presents iMOVE's submission to the Productivity Commission's inquiry into National Transport Regulatory Reform.

iMOVE is a consortium of 44 industry, government, and research partners engaged in a concerted 10-year effort to improve Australia's transport systems through collaborative R&D projects. Our work contributes to Australian firms being more competitive, productive, and prosperous through:

- analyses, evaluation, and development of new technologies to build Australia's intelligent transport infrastructure;
- the development of innovative models and software to manage the transport and mobility network as a single system;
- the creation of an open access data platform to integrate disparate transport-related datasets; and
- driving entrepreneurship and innovation in the mobility and freight sectors.

iMOVE has made this submission with the intention of furthering the important discussion around microeconomic reform of the Australian transportation sector and its supporting infrastructure network. While Australia's record of reform across other network industries, such as telecommunications for example, has been demonstrably effective in lowering real costs and greatly expanding competition and choice for consumers, it is arguable that transport has lagged behind. In some ways, this is understandable given the fragmentation of responsibilities for owning and operating the road and rail networks that form the greater part of Australia's transport system. In this regard, policy coordination to achieve shared national objectives requires greater effort through COAG as a result of state-based custodianship. However, with the wave of new technology that is fundamentally changing the transport landscape, we think it is worth re-visiting this significant microeconomic reform challenge.

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Managing Director

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## Abbreviations

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ALC	Australian Logistics Council
AMSA	Australian Maritime Safety Authority
BITRE	Bureau of Infrastructure, Transport and Regional Economics
CAV	Connected and Automated Vehicles
CBA	Cost Benefit Analysis
CITS	Co-operative ITS
COAG	Council of Australian Governments
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DIRDC	Department of Infrastructure, Regional Development and Cities
GPS	Global Positioning System
GVA	Gross value added
IAP	Intelligent Access Program
ICT	Information and Communications Technology
IDI	Integrated Data Infrastructure
IGA	Intergovernmental Agreement (via COAG)
iMOVE	iMOVE Australia (incorporating the iMOVE Co-operative Research Centre)
IoT	Internet of Things
IP	Internet Protocol
IPA	Infrastructure Partnerships Australia
IT	Information Technology
ITS	Intelligent Transportation Systems
MaaS	Mobility as a Service
NDC	National Data Custodian



NFSC	National Freight and Supply Chain (Strategy)
NHVR	National Heavy Vehicle Regulator
NSS	National Statistical Service
NTC	National Transport Commission
OECD	Organisation for Economic Co-operation and Development
ONRSR	Office of the National Rail Safety Regulator
PC	Productivity Commission
TIC	Transport and Infrastructure Council
TfNSW	Transport for New South Wales
TMR	Department of Transport and Main Roads Queensland



## Executive Summary

### Role of data in the 21<sup>st</sup> century economy

The unparalleled growth in data generation, dissemination and use since the mid-2000s has enabled a profusion of data-related products, applications and services for businesses and households. Across Australia's vast transportation system, this information and communications technology revolution has provided network users such as private vehicle and freight operators, as well as regulators, state transport departments and other government agencies with the tools to support real-time monitoring and management of the network. The revolution continues, with the introduction of 5G networks in 2019 and beyond set to greatly expand applications to enhance network efficiency and safety, both individually and across the network. In short, this technology revolution has the potential to significantly increase system-wide transport network efficiency and, in turn, contribute to increasing Australian living standards.

### This brave new world requires new thinking

In this submission, we argue that this ICT revolution calls for a rethink of how Australia's transport network operates on a day-to-day basis, and how the network is regulated. **We are proposing to build on the COAG reforms of 2011 (as set out in the three IGAs and related legislation establishing the national regulators) and move towards greater utilisation of available data and greater uniformity across regulators in recognition that Australia's transport network operates as a single system.**

While it is true that there are significant differences between rail, heavy vehicles and maritime industries, there are also critical network interdependencies. And these linkages are more likely to intensify rather than dissipate going forward. If those interdependencies are not recognised, and we persist with a siloed approach to transport regulation, we would expect future productivity will be constrained and regulatory settings risk being inconsistent and 'mode-parochial'.

Going from fragmented state regulators, to national mode-based regulators, to ultimately a single national regulator has been recognised in other infrastructure sectors. It's part of Australia's regulatory 'journey'. We propose that our reform journey, in the transportation space is not about more regulation, but better regulation.

We recognise that this reform will involve major transitional issues and will take time to implement. As such, **we consider a staged pathway that first seeks to identify a common governance framework and practical data sharing arrangements that have broad public and industry support.**

Data sharing arrangements are particularly tricky and will require increased involvement from the Commonwealth Government to provide coordinating support to the states and the national regulators. In previous work undertaken for the Federal Department of Infrastructure, Regional Development and Cities (DIRDC), iMOVE found that it is unlikely to be cost effective (or even possible) for a single firm to collect and disseminate nationally industry-wide data. There would also be confidentiality issues around the dissemination of such data. At the same time, the availability of



standardised, timely and quality datasets about Australia’s freight sector may deliver significant public benefits. Accordingly, all governments can play an important role in realising the ‘public good’ value of data while maintaining its private value to individual firms.

## A governance framework for the 21<sup>st</sup> century

iMOVE considers that a greater use of data by the regulator to facilitate industry oversight can potentially significantly reduce the regulatory burden placed on industry operators. The use of existing and new datasets could facilitate a move away from relatively prescriptive, ‘one size fits all’ regulations to a more flexible, dynamic and adaptive approach. We believe that ‘better data’ will deliver greater visibility and transparency, which in turn enables more nuanced approaches to the achievement of regulatory compliance. As a result of these reforms, industry productivity is likely to increase.

Complex trade-offs between efficiency, safety and other objectives (such as pricing and network reliability) are an inherent feature of all infrastructure industries, even if they are not explicitly stated, and this is also the case in transport. We propose that these trade-offs be deliberately considered and dealt with under the auspices of a single regulator.

Placing state-based system operators and regulators under a common governance framework – possibly directed and administered by a national transport system coordinator – would provide the opportunity to reset the objectives to include balancing safety and network efficiency. Such a national transport system coordinator would have a mandate to pursue the following objectives that are not reflected in the current regulatory arrangements:

- to adopt a systemwide perspective of the national transport system, so as to maximise productivity subject to maintaining the current strong safety performance;
- to facilitate and support the introduction of data-driven technologies across users and the national transport system in order to support productivity and safety objectives; and
- to facilitate and support the collection and dissemination to users, governments and other stakeholders of data about transport flows across the system.

## The potential benefits of regulatory reform are large

We recognise that there are challenges in moving to this brave new world we describe. Nonetheless, Australia’s track record of microeconomic reforms over the past four decades across network industries such as electricity, telecommunications and water indicates that this goal is achievable. The economic significance of Australia’s transport system is hard to overstate, and the potential benefits from significant reform could be enormous, as the Productivity Commission has previously identified:

*“Improved management of urban transport infrastructure will bring savings to taxpayers in the costs of building and maintenance.”* (PC 1994, Inquiry into Urban Transport, Volume 1, p.6).

*“Efficient freight infrastructure is of particular importance to Australia, given its dispersed population and production centres.”* (PC 2006, Road and Rail Freight Infrastructure Pricing, p.xxvi).





Today, the Australian transport sector currently accounts for around 7.4 per cent of gross domestic product (GDP). On all current projections, the demand for transport services – be it for bulk commodities, freight or personal transport services – is set to grow rapidly. Public and private infrastructure investment continues to expand Australia’s transport network. The value of the asset base, if calculated, would likely be in the order of hundreds of billions of dollars. Thus, small changes in system-wide productivity growth have large economic impacts.

In previous work for DIRDC, iMOVE estimated the size of the Australian freight supply chain industry, in terms of the gross value added generated annually, at \$106.5 billion (2017-18). Based on this estimate, a 0.1 per cent (that is, a one-tenth of 1 per cent) improvement in capital and labour productivity would increase the gross value added (GVA) of the industry by almost \$80 million annually. Similarly, a 0.5% (that is, one-half of 1 percent) improvement in capital and labour productivity would increase industry GVA by close to \$400 million annually.

These potential benefits would far exceed the costs of further regulatory reform to achieve a seamless national transport system. We recommend as follows:

## Recommendation 1

In the short-term, the existing three transport regulators should move towards, and operate under, a **shared governance framework and common information model**.

Over the longer term, a **national transport regulator** that encompassed Australia’s major highways, rail lines, ports, and domestic air and seaways should be established in order to better integrate transport modes and support a systems-based approach to transport regulation.

The existing National Transport Commission, which reports directly to COAG’s Transport Infrastructure Council, would be given an expanded role to establish the rules that the NTR would enforce.

## Recommendation 2

An **Australian National Transport Coordinator** should be established with a systems approach to managing Australia’s transport network to optimise the dual goals of efficiency and human safety. The ANTC may devolve local responsibilities to existing state traffic controllers (such as Metro Trains Melbourne or TRANSLink in SEQ) where it is practical or cost-effective to do so, but maintain overall responsibility for network efficiency and safety.

The ANTC would operate in a similar way to a passenger or freight rail network coordinator or the Australian Electricity Market Operator.

## Recommendation 3

The Australian Government, via the COAG Transport Industry Council, should develop transition pathway to achieve the objectives set out in Recommendations 1 and 2.



## 1 Introduction

### 1.1 Recent Australian transport reform

The regulatory framework put in place by the Council of Australian Governments (COAG) via the three IGA's on 19 August 2009 focused on maritime, rail and heavy vehicle safety. These reforms essentially created three separate regulatory strands, namely the regulation of:

- heavy vehicles by the National Heavy Vehicle Regulator (NHVR);
- rail safety by the Office of the National Rail Safety Regulator (ONRSR); and
- commercial vessels by the Australian Maritime Safety Authority (AMSA).

There are additionally a range of other quasi-regulatory bodies, including the Transport Infrastructure Council (TIC), the Transport and Infrastructure Senior Officials' Committee (TISOC), and the National Transport Commission (NTC). Overall, and notwithstanding the reforms, different regulatory approaches and jurisdictional variations remain in place, as does significant involvement on the part of governments and government departments.

### 1.2 The status quo is outdated

The current patchwork of regulations and inconsistent governance arrangements may have served a purpose at a time when global connectivity played a lesser role, but have become increasingly outdated:

- we now live in an interconnected and online world in which seamless and efficient transport solutions are increasingly available, cost-effective and important for businesses and consumers;
- new technologies offer the potential for significantly improved real-time data collection and sharing, with the potential for efficiency gains across the economy; and
- the importance of multi-modal transport elevates the importance of regulatory consistency across jurisdictions and a common framework across transport modes, as a means of reducing costs and enabling better planning and investment decisions.

### 1.3 About this submission

The Productivity Commission (the Commission) has been asked to examine reforms in transport regulation, including the benefits for Australia from each reform stream and the performance of the three regulators. iMOVE's submission mainly focuses on the third aspect of the Commission's remit: the opportunities for further reform "*to integrate and harmonise*" the national freight market, including the "*current focus and remit*" of the three regulators.

This submission is structured as follows:

- in Section 2 we briefly describe iMOVE, its remit and research focus;



- in Section 3 we set out the broader context for Australia’s transport sector, the coming challenges, and the potential opportunities that new technologies offer for addressing these challenges; and
- in Section 4 we address a subset of the Commission questions that are relevant to the broader governance issues that our central focus.



## 2 About iMOVE

This section describes iMOVE, its remit and principal objectives.

### 2.1 iMOVE Cooperative Research Centre

The iMOVE Cooperative Research Centre (iMOVE) is a consortium of 44 industry, government, and research partners engaged in a concerted 10-year effort to improve Australia's transport systems through collaborative R&D projects. 17 universities participate in the iMOVE education and training program, which includes an undergraduate student industry program and a postgraduate student program. iMOVE is governed by a nine-member board, comprising five independent directors, and four iMOVE participant members.

This section describes iMOVE, its remit and principal objectives.

### 2.2 Research focus

iMOVE's research focus can be classified into three broad streams:

- **Intelligent Transport Systems and Infrastructure:** This programme will deliver the technical infrastructure, data frameworks, models and tools to support increasingly sophisticated management of our transport networks.
- **End-to-end freight solutions:** The availability of better data, and emerging visibility along supply chains from end to end creates opportunities to optimise operations across wider ranges of processes thereby significantly increasing efficiency and performance.
- **Enhanced Personal Mobility:** This programme is focused on the development of new and innovative solutions to allow the mobility system to be more traveller-centric and provide a more personalised experience (i.e. Mobility as a Service, or MAAS).

### 2.3 Research projects

As part of this overarching framework, iMOVE undertakes specific research projects, as required by government and other stakeholders, some of which may be relevant to the Commission's inquiry.

Projects completed or underway relevant to this submission include:

- **Freight Data Requirements Study**

Undertaken for the Federal Department of Infrastructure Regional Development and Cities. This study examined the data needs of the Australian freight and supply chain sector. It found good evidence that better freight data could enhance the efficiency of Australia's freight supply chain and, in turn, benefit the Australian community via higher productivity. Recognising the complexity inherent



in the national freight task and the range of stakeholders involved, the study identified a number of gaps in information availability and considered how they could best be resolved for the benefit of freight operators, supply chain and logistics firms, industry associations, and all three levels of government.

- Planning intermodal and general logistics infrastructure for the future needs of Perth

Commissioned by the Western Australia Department of Transport, this project is a suite of related research streams to support the Westport Taskforce in planning for the Outer Harbour at Kwinana. It focusses on the associated road and rail links and their roles in a long-term integrated transport plan for Western Australia.

In consultation with both industry experts and industry partners, iMOVE is developing projects in areas including:

- Systems for maximising freight quality

Fit-for-purpose methods and technologies for the monitoring of individual goods, including dwell times at any stage, frequency of handling, condition (perishables, livestock) and supply chain environment.

- Real-time, end-to-end, risk management models

Models that consider supply chain unanticipated disruptions and interruptions, loss, damage or risky behaviours in material handling, packing or packaging and switching between transport modes.

- Multi-modal Information Service and Data Framework

A structured database of real-time positioning and state information on all modes of transport and associated infrastructure.

- New Generation Transport models

Models that use new sources of data and intermodal information to support network, planning, infrastructure design and the development of traffic management systems.

- Personalised journey planner

A multi-modal planning tool that will allow users to plan journeys using one or many modes of transport, with real-time information, predictive capability, and integrated payment.

## 2.4 A more efficient, integrated transport system for the 21<sup>st</sup> century

Through its research activity and advocacy iMOVE is seeking to assist Australia in moving towards a more efficient, integrated transport system that meets the needs of businesses and consumers, today and in the future.

As we set out in this submission, Australia faces many challenges in making its freight transport system better fit-for-purpose in our increasingly interconnected world. iMOVE considers that new and



emerging technologies offer significant opportunities to achieve better coordination across transport modes and the associated infrastructure, and also alleviate the constraints that are projected to become increasingly pressing.



### 3 Challenges and opportunities for Australia's transport sector

The COAG regulatory reforms were part of a broader reform agenda that aimed to lift productivity, and increase workforce participation and mobility. These objectives are as relevant today as they were in 2008, but in the view of iMOVE, the arrangements in place today have been overtaken by developments in technology and society are no longer well-suited to achieving them.

Australia's transport sector faces many challenges. It is impacted by competing pressures from growth in population and freight movement intensity, a rise in international trade and increasing congestion. The resulting pressure on Australia's transport infrastructure will create an increasing burden on government budgets, to fund capacity expansion and debottlenecking.

As we set out in this submission, iMOVE considers that new technologies and innovations offer significant potential to alleviate many of these challenges and sustain and improve Australia's living standards over the longer term. While greater data capabilities will undoubtedly raise concerns that need to be addressed, the potential benefits from improved system visibility and a broad range of safety and other applications are substantial.

#### 3.1 The challenges for Australian transport

In 2015-16, the economic contribution of transport (including both for-hire and in-house activity) to the Australian economy was around 7.4 per cent of GDP.<sup>1</sup> Australia's economic competitiveness is closely linked to the quality of the national supply chain infrastructure, yet both labour and multifactor productivity in the transport sector fell in the period from 2011-12 to 2017-18 (Productivity Commission 2019).

Declining productivity in transport should be of great concern to policy makers since the importance of transport is expected to grow.

##### 3.1.1 Rapid growth in the transport task

Recent projections suggest that the demand for transport services, including public transport, road and rail freight, and air and maritime transport are all projected to grow rapidly to 2030 (Commonwealth of Australia 2016).

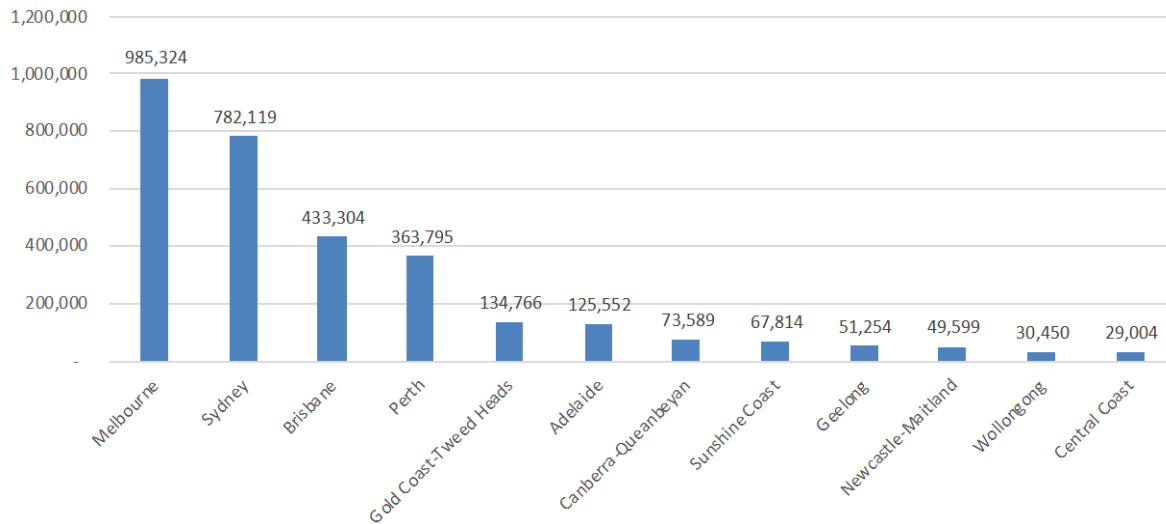
Australia's population has increased by 3.7 million people (or by 1.6 per cent per year) in the decade between 2008 and 2018 (Figure 3-1). Melbourne has seen an increase of almost 1 million people in the last decade, and Sydney (782,000), Brisbane (433,000) and Perth (364,000) have also seen significant increases in population. Regional towns adjacent to our major capital cities, such as the Gold Coast-Tweed Heads and Sunshine Coast (Brisbane), Geelong (Melbourne), and Newcastle-Maitland and Wollongong (Sydney) have also experienced strong population growth.

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<sup>1</sup> <https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/5270.0Main%20Features52010-11%20to%202015-16?opendocument&tabname=Summary&prodno=5270.0&issue=2010-11%20to%202015-16&num=&view=>; accessed on 22 June 2019.



**Figure 3-1. Population increases in Australia’s major population centres, 2008 to 2018**



Source: ABS 3218.0 Regional Population Growth Australia.

According to the most recent forecasts, Australia will be faced with increasing bottlenecks and delays on publicly owned roads and rail infrastructure (Infrastructure Australia 2015):

- in the absence of additional capacity, the demands on urban transport networks (including urban roads, passenger rail, buses, light rail and ferries) will exceed capacity more often, more seriously and in more locations;
- heavy vehicle usage of national highways is expected to nearly double between 2010 and 2030; and
- the demand for freight rail is projected to grow and continue to encounter capacity constraints, including for resource bulk commodity haulage, the movement of goods between ports and inland freight terminals, and the movement of containerised and general freight over longer distances.

### 3.1.2 Current transport governance arrangements

As it currently exists, the current approach to planning, governance and oversight of the transport sector is not equipped to deal with these challenges. The reasons for these outcomes have been extensively investigated:

- In freight, they range across land (access) restrictions at key freight terminals that impeded performance, conflicting priorities for movement of freight and passengers on our rail and road networks, a lack of data and information on the performance of Australia’s many freight supply chains, inadequate jurisdictional strategies for protecting strategic corridors and industrial and logistics areas, and a lack of integrated planning and harmonisation of freight regulation and governance (Commonwealth 2018).





- In the area of urban transport, public transport and roads have failed to keep pace with new housing growth. Public transport in the outer suburbs is typically characterised by lower levels of access, poor frequencies, and longer travel times (Infrastructure Australia 2018a). More generally, infrastructure delivery is struggling to keep pace with rapid population growth and change, and current funding models are not suited for achieving the timely delivery of local and state infrastructure (Infrastructure Australia 2018b).

As a recent report on Australia's freight supply-chains for the Bureau of Infrastructure, Transport and Regional Economics (BITRE) summed up (p.8):

*The efficiency of Australia's key freight supply-chains materially impacts on our productivity performance, economic growth and living standards. Inadequate transport links can raise firm costs, force excessively dispersed production (thus causing the loss of economies of scale, scope and agglomeration), create local pockets of monopoly power, and reduce the efficiency with which labour markets match job seekers and employers.*

### 3.1.3 The need for a review of transport governance arrangements

This points to the growing importance of two issues that should be of primary concern to Australian policy makers:

- The current system of governance essentially partitions regulatory responsibility by mode of transport, and includes numerous separate jurisdictional entities in the operation and planning of the transport network. A more integrated framework is required that recognises the interdependencies between transport modes, and that furthermore explicitly recognises the shared nature of much of Australia's infrastructure, in particular between the movement of passengers and freight.
- As pressure on publicly owned transport infrastructure mounts, the issue of cost recovery will become increasingly important (Infrastructure Australia 2015). The development and maintenance of Australia's land transport networks is funded primarily through government outlays; going forward, the existing arrangements for funding Australia's transport networks are likely to become unsustainable.

## 3.2 Future opportunities

Rapid technological change and transport innovations offer the potential to alleviate many of the issues that beset Australia's transport networks and supply chains, including improving safety outcomes, better managing congestion and potentially reducing the need for government expenditures. It is here that iMOVE sees an opportunity for leadership by regulators and governments, to set the framework under which these new technologies can be adopted.

iMOVE considers that a key challenge is to put in place a regulatory and governance framework that will help Australia harness the potential that new technologies and big data can bring. While it must be recognised that new technologies also pose some challenges, including concerns about privacy and surveillance, these are issues that can, and must be addressed.



### 3.2.1 Future roles of data-intensive technologies and intelligent transport systems

New data-driven technologies, as embodied in 'intelligent transport systems' (ITS) integrate information, communication, and sensor technologies in vehicles and transportation infrastructure in order to provide real-time information for road users and transportation system operators:

- integrating advanced wireless communications technologies into transportation infrastructure and vehicles enables improvements in transportation safety and mobility. In this context ITS includes coordination of traffic signals, giving priority to transit lanes, electronic information signs and variable speed limit signs, and the ability to automatically distribute real-time traffic data to apps.
- ITS also offers wireless communications to connect vehicle-to-vehicle (V2V), vehicle-to-pedestrian (V2P) and vehicle-to-infrastructure (V2I), collectively referred to as V2X. Connected vehicles help recognise and alert drivers to dangerous situations. By adding communication points in hazardous road areas and intersections, V2X technology extends crash-reduction capabilities by allowing automatic control of signal timing, speed management, and operation of transit and commercial vehicles. Cooperative ITS systems (C-ITS) can enable connected vehicles to broadcast relevant warnings, and report on system performance in real time and across the entire road network.

### 3.2.2 Safety

Safety can be enhanced by intensification of data generation and usage across the transport system. In-vehicle examples include:

- collision avoidance systems that detect nearby vehicles and potential roadway hazards to alert drivers and take proactive measures to avoid or mitigate the severity of a collision;
- lane departure warning systems to alert drivers when vehicles drift from their lanes; and
- drowsy driver warning systems to detect when a driver is showing signs of fatigue.

At the roadside it is also possible to establish intersection collision avoidance systems that monitor traffic at dangerous intersections and warn vehicles of approaching cross traffic via roadside signage;

- dynamic curve warning systems that measure the speed of vehicles approaching a curve and warn drivers to slow down based on real-time conditions; and
- road weather sensors that deliver real-time information about icy bridges, water on the road, rain or fog, and other potentially hazardous conditions through dynamic message signs, highway advisory radio, and in-vehicle navigation systems.<sup>2</sup>

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<sup>2</sup> As an example, the Australian technology firm Cohda Wireless has developed V2V (Vehicle to Vehicle) and V2I (Vehicle to Infrastructure) technology that has the potential to significantly reduce accidents on Australia's road network.



### 3.2.3 Mobility as a Service (MaaS)

Mobility as a service (MaaS) is a combination of public and private transportation services within a given regional environment that provides holistic, optimal and people-centred travel options, to enable end-to-end journeys paid for by the user as a single charge, and which aims to achieve key public equity objectives (Cubic 2019). The prime benefit of MaaS is to make commuting easy, enjoyable, and efficient for customers. Shared data will also bring efficiencies and increase demand for providers. A major benefit of MaaS is a reduction in the use of private cars, given that the primary driver of traffic congestion is the single occupant car. Less congestion leads to better safety, reduced air pollution, and an improved experience for commuters.

### 3.2.4 Data-driven technologies in Australia

ITS have already begun delivering incremental changes to Australia's transport systems:<sup>3</sup>

- The Australian Communications and Media Authority (ACMA) has introduced the Radiocommunications (Intelligent Transport Systems) Class Licence 2017 regulations to enable the 5.9 GHz band to be used for ITS in Australia.
- iMove is developing new technologies and solutions to tackle major transport issues such as congestion, road trauma and end-to-end freight movement. One of iMOVE's first projects is a \$2.58 million, 3.5-year research partnership between industry, the Queensland University of Technology and the Queensland Department of Transport and Main Roads, to test C-ITS safety applications.
- Australian industry is utilising Data61 simulation to model ramp signalling on motorways. Organisations like Real Serious Games and Sydac use augmented reality, as well as simulation, to train operators of multi-modal public transport systems. Australia's National Transport Commission is also reviewing the use of telematics for regulatory purposes across the transport sector, to encourage further take-up and realise the safety and productivity benefits it can provide. Australian companies such as Intelematics and MTDData are working directly with government and industry to implement their telematics technologies.

### 3.2.5 Data-driven technologies and the role of government and regulators

Effectively deployed, data-driven technologies have important implications for the role of government as planners and funders of infrastructure investment. For state and local governments, the question is which investments will allow them to more effectively and efficiently utilise the existing transportation infrastructure. ITS can potentially save billions of dollars by facilitating better utilisation of existing transportation infrastructure.

Harnessing the potential benefits of data-driven technologies and ITS to support the freight transport task requires a new assessment of the role and scope of transport regulators:

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<sup>3</sup> <https://www.austrade.gov.au/future-transport/intelligent-transport-systems/>; accessed on 22 June 2019.



- While safety will remain an ongoing focus of regulation, regulators should adopt a forward-looking approach that recognises and incorporates the potential for ITS in their regulatory framework. This requires a shift from a prescriptive, rules-based approach to one that is more flexible and recognises the capabilities of new technologies to help manage safety and other issues.
- Access to considerably more, up-to-date data would permit better management of existing infrastructure and better planning and investment decisions to be made. The issue then becomes whether the current approach of separate transport regulators that are largely focused on safety issues and have no remit or incentive to consider the broader interconnectedness of transport across the system would be capable of taking on such a role. There may then a role for an overarching national regulator with oversight of transport flows and infrastructure, including roads, rail, ports etc.

### 3.2.6 Harnessing ‘big data’

The shift to data-driven technologies and ‘big data’ is taking place across all aspects of the modern economy. These innovations offer means of reducing congestion costs, and delivering better safety outcomes overall. These benefits accrue to users directly and indirectly via the infrastructure partners to make more informed investment decisions.

At the same time, there will inevitably be privacy concerns associated with the increased creation and use of surveillance and monitoring data- However, these are challenges that also exist in other network industries that similarly rely on extensive telemetry and data collection, as is the case in the electricity sector, and where codes of practice and procedures have been put in place to ensure that data are collected and handled appropriately. iMOVE recognises that the issue of data privacy needs to be addressed as part of any implementation of data-driven technologies across the transport system, but that this is an issue that can be resolved.



## 4 iMOVE's response to the Issues Paper

In the following we first describe the overall framework that iMOVE considers is required to ensure that Australia's transport system is fit to deal with existing and future challenges. We then provide iMOVE's responses to the questions raised in the Commission's Issues Paper. We have limited our responses to those issues where iMOVE believes that it can add value.

### 4.1 Overarching comments: A framework for the 21<sup>st</sup> century

As we set out in Section 3, Australia's transport system faces substantial challenges in terms of the existing and future demands that will be placed on the network.

**Overcoming these challenges and establishing a regulatory framework that is fit-for-purpose for the 21<sup>st</sup> century will require a change in thinking and approach.**

An important aspect of this new approach is meeting the changing expectations of citizens, for instance in terms of same-day parcel delivery or being able to get to work in under 30 minutes, and utilising the enhanced monitoring capabilities of a technology-enabled 'real-time' network. Increased monitoring has the potential to reduce freight costs, the costs of congestion and at the same time improve safety, bypassing a heretofore necessary trade-off between cost and safety that was part of the 'old world order'. Fundamental to improving on today's levels of efficiency and safety will be making the changes required to the regulatory and governance framework for our national transport network.

#### 4.1.1 An integrated governance framework is required

The current system of governance, while an improvement on last century, remains a patchwork that essentially partitions regulatory responsibility by mode of transport, and includes numerous separate jurisdictional entities that are involved in the operation and planning of the transport network. iMOVE considers that a more integrated framework is required which recognises the interdependencies between transport modes such as road, rail and ports, and that furthermore explicitly recognises the shared nature of much of Australia's infrastructure, in particular the movement of passengers and freight on the same networks.

While the COAG TIC reforms of 2011 represented a significant step towards a nationally coordinated approach ('by mode'), ultimately these reforms have failed to achieve the policy objective. For instance, while Western Australia and the Northern Territory signed the Intergovernmental Agreement (IGA) to join the NHVR, neither jurisdiction has adopted the National Laws. And Queensland only joined the NRSR on 1 July 2017.

More broadly, as the Commission has pointed out in its Issues Paper, there are three reasons why these National Laws are not necessarily national in scope and application.

- First, to achieve national scope the laws must be operating concurrently in each jurisdiction.
- Second, even where national regulation is ultimately achieved, "variations in the time taken for individual jurisdictions to introduce and ultimately pass legislation to apply the law locally mean inconsistency in the interim" (PC Issues Paper, 2019).



- Third, if State/Territories adopt ‘mirroring’ (as opposed to ‘referring’) legislation, then this “approach creates opportunities for States/Territories to make amendments, additions, carve-outs and grandfathering arrangements to the national law as it applies in their jurisdictions, which may frustrate the process of achieving nationally consistent regulation” (PC Issue Paper, 2019).

In summary, we have not achieved what we set out to do in 2011. And in the meantime, there has been a revolution in transport system related technologies that raises many challenges and opportunities that need to be addressed in the context of an imperfect regulatory and governance system.

The need for a system-wide perspective of Australia’s transport network highlights an important role for a national transport coordinator to oversee seamless and integrated network operations, and the efficient planning of transport infrastructure that is of national importance, including the dissemination across the system of interoperable data-driven technologies. iMOVE envisages that the system coordinator would work closely with existing modal regulators and the jurisdictions to move towards an integrated national transport system. Over a longer-term timeframe, iMOVE envisages that such a coordinating body would have oversight of and direct the existing modal regulators.

#### 4.1.2 A focus on system-wide efficiency and safety

The current responsibilities of Australia’s transport regulators are largely focused on safety issues. While safety is rightly a key concern of governments, the productivity of all forms of transport, including the productivity of the large supporting infrastructure networks, plays a paramount role in underpinning Australia’s living standards and future prosperity.

**Complex trade-offs between efficiency, safety and other (such as pricing and network reliability) objectives are an inherent feature of all infrastructure industries, even if they are not explicitly stated, as is the case in transport.**

In the regulation of electricity networks, for instance, safety matters form part of the framework for regulation and cost recovery; in effect, the regulator decides where the balance between cost and safety should reasonably lie. It can similarly be assumed that even if a regulator such as the ONRSR has a remit that is almost entirely focused on safety issues, it will consider cost and other trade-offs in its deliberations since a ‘safety at all cost’ approach will almost certainly serve neither operators nor consumers as the cost would be prohibitive.

That is not to say that safety outcomes within the Australian transport system are satisfactory, even within a context where safety is the main stated priority of regulators. According to the most recent data from BITRE, there are around 100 road deaths per month in Australia, or 1,210 road deaths per year on average since 2015 (BITRE 2019).



**Table 4-1. Transport road deaths in Australia**

<b>12 months ended March</b>	<i>Driver</i>	<i>Passenger</i>	<i>Pedestrian</i>	<i>Motorcyclist<sup>b</sup></i>	<i>Pedal<sup>b</sup> cyclist</i>	<i>Total<sup>c</sup></i>
2015	519	221	151	196	39	1,129
2016	583	242	163	223	35	1,248
2017	600	210	172	226	21	1,234
2018	584	236	181	212	43	1,265
2019	549	209	169	210	34	1,176

Source: BITRE (2019).

In addition, as we have described above, the Australian transport sector plays a key role in the Australian economy, and the productivity or efficiency of that sector should therefore be a matter of central importance for policy makers. Sustaining Australia’s future prosperity and growth without a well-functioning and efficient transport system is simply not an option. Here too, better data and improved technologies applied across the system may enable a system coordinator to achieve greater efficiency while maintaining the same or a greater level of safety.

## 4.2 National consistency of regulation

*Has nationally consistent regulation been achieved?*

*Should any inconsistencies in the current system be addressed? If so, how?*

The Australian Federation has shifted somewhat haphazardly between adhering to the principles of cooperative and competitive federalism for over 100 years. Historically, Australia has suffered from a lack of interoperability and standard processes across our state borders with the lack of a national-standard rail gauge being an oft-cited example.

From 2008 onwards, COAG pursued the cooperative federalism pathway via *the Seamless National Economy* initiative. Progress was made in a number of areas such as occupational licensing and, of course, the national regulation for heavy vehicles, and rail and maritime safety. However, inconsistencies and overlap remain, largely driven by the nature of federal financial relations and the remit of state governments to regulate their own transport networks.<sup>4</sup> In particular, the interdependent and interconnected nature of transport modes is not reflected in the current regulatory and governance arrangements, and these disjointed arrangements prevent the uptake and diffusion of valuable ITS and other technology initiatives across the transport system.

In today’s interconnected environment, seamless communication is a reality and seamless transportation flows are increasingly important. iMOVE believes that in this context, **cooperative federalism should find its practical application in the inter-operability and consistent uptake and diffusion of ITS and other data-intensive initiatives across the system.** Outcomes, such as the need for operators to carry different radio sets when travelling between Sydney and Perth are examples of obstacles that are both a source of added transactions costs and that prevent effective information sharing even across the same transport mode. What are currently effectively transport mode ‘silos’ can and should be linked with interoperable communication systems to handle such information as

<sup>4</sup> For example, Queensland did not pass legislation to accept the ONRSR until 1 July 2017, enabling nationwide coverage.



safety credentials, goods information and other data and allow far more efficient cross-mode transfers. In effect and in summary: **‘information and data sharing is the tide that raises all boats’**.

More generally, and as we have outlined in Section 3, data-intensive technologies offer important advancements in the area of road and rail safety, and the greater uptake of new signalling technologies can potentially greatly improve both the enforcement of existing standards and the scope for predictive actions to be taken to mitigate future hazards. These technologies additionally offer substantial benefits in the area of data collection where the absence of reliable and up-to-date information about transport flows currently creates both operational and planning barriers for transport users and governments.

iMOVE therefore considers that important advantages would flow from the **creation of a transport system coordinator with oversight across all modes of transport and infrastructure** and a mandate that encompasses the coordination of transport infrastructure, the uptake of new technologies, and the collection of freight data (in concert with the National Freight Data Hub) to assist both users and planners of Australia’s transport infrastructure.

#### 4.2.1 Coordinating and planning publicly owned network infrastructure

A key role for a national transport system coordinator would consist of coordinating the operation of and planning for all publicly owned transport infrastructure, including rail, roads, and intermodal terminals, with the objective of identifying and addressing existing and future bottlenecks. Such a role would require the coordinator to adopt a system-wide approach for modelling and projecting transport flows, and how demands on one part of the system can be expected to affect others. iMOVE envisages that such a role would consist of engagement with all key stakeholders, including transport operators and users, governments, as well as private infrastructure owners (such as port and intermodal terminal operators).

#### 4.2.2 Facilitating the uptake of new technologies

A second key role for the system coordinator is to facilitate the move of the transport industry as a whole to take up new data-driven technologies, including the telemetry infrastructure needed to support it. The uptake of interoperable new technologies will facilitate a range of outcomes that will both support safety and broader productivity objectives across the system. There is already a clear precedent for such a role in Australia; for instance, the Australian Energy Market Operator determines the respective telemetry standards and protocols for all types of industry participants across the national electricity market (NEM) in consultation with stakeholders.

#### 4.2.3 Data collection

The third key area of focus for the system coordinator is the collection and sharing of data on transport flows across modes and jurisdictions in order to provide all stakeholders with a better information about existing and emerging constraints. The current lack of timely, consistent, and comprehensive data about freight flows has been identified as a key issue that is impeding efficient investment in Australia’s transport infrastructure.

iMOVE supports the proposed initiative to create a new ‘Freight Data Hub’, a key recommendation in its report for the Federal Department of Infrastructure Regional Development and Cities Freight Data Requirements Study. If that initiative is successfully implemented, the system coordinator could more readily source these useful and available datasets from the Freight Data Hub.





In this way, the system coordinator would have three sources of information, being:

- aggregated information from the Freight Data Hub across the entire transport network;
- direct information provided by freight and passengers users to the system coordinator; and
- legacy or ongoing data collections from the three modal transport regulators, as well as the Australian Transportation Safety Bureau (ATSB), Infrastructure Australia and other bodies.

Clearly, arrangements and protocols would need to be put in place to ensure the safe, legal and appropriate exchange of data between these institutions.

### 4.3 Have regulatory burden and costs fallen?

*How might any unnecessary regulatory burden and compliance or administrative costs be reduced?*

iMOVE makes the following observations with respect to the relationship between technology, regulatory costs and regulatory effectiveness.

New and evolving transport technologies offer the potential to improve both safety and efficiency and move away from 'old world' prescriptive and costly regulation. For instance, the NHVR currently regulates the safety of the national heavy vehicle fleet through a combination of standards and procedures, accreditation schemes, industry codes of practice and various other instruments. In addition to the safety-enhancing technologies described in Section 3, new data-driven technologies offer the potential for ongoing monitoring of transport operators, including the possibility of 'flagging' recurrent safety breaches on the part of a particular operator to the regulator. Over time, it may be possible to move to a system that essentially plays a neutral, passive role, and that is only activated in circumstances where intervention is merited.

For instance, the OECD has noted that:

*"Applying a data-driven approach to regulating fully automated vehicles could provide a better governance framework for vehicle automation. It could potentially extend beyond type approval for ensuring safe operation of vehicles. Much of the underlying information required for regulating the various aspects of road-based freight transport relates to the geo-location of vehicles over time.*

*Traditionally regulation has been fragmented with separate interventions covering safety, access to road networks, protection of road infrastructure, access to markets, and other factors. A more straightforward approach would be the tracking of automated freight vehicles and their performance across the network. Recent progress in mapping, sensor, and IT technologies makes such a solution feasible.*" (Voegelé, 2019, emphasis added).

It is important to note that not only can evolving technologies significantly contribute to safety and compliant behaviour, but the recurrent cost burden of the new technology is exceedingly low. In other words, in economic terms, the short-run marginal cost of these new technologies is close to zero. Even accounting for small, but not insignificant, upfront cost for operators (eg. device cost, install App, learn how to use device, etc.), it nonetheless represents a substantial opportunity.

Data-driven technologies can therefore make a potentially significant contribution to safety and compliant behaviour. iMOVE notes that while there is an upfront cost, the recurring cost burden of the relevant new technologies is relatively low.



Overall, iMOVE therefore considers that a greater reliance on ITS and related transport technologies can potentially significantly reduce the regulatory burden placed on industry operators by facilitating a move away from relatively prescriptive, ‘one size fits all’ regulations to a more flexible and dynamic approach.

#### 4.4 How can productivity outcomes be improved?

*What changes to the current system could improve productivity outcomes?*

*Should the remit of ONRSR and AMSA be expanded to include productivity objectives or should this be the responsibility of other institutions and agents?*

Australia’s transport system is vital to national productivity. Australia’s tens of thousands of kilometres of roads, rail lines and air and sea ports infrastructure support the essential freight transport services that link our primary resources, commodities, intermediate inputs and finished goods to our capital cities, regional towns and the rest of the world.

Australia relies on a number of key export, import and domestic freight supply chains to underpin a significant proportion of national income and maintain our high standard of living. These key supply chains connect Australia’s resources basins and agricultural regions to capital city and regional ports such as the Port of Melbourne, Port Botany and the Port of Gladstone. Australia’s freight supply chains are the backbone of the Australian economy. Without this spine linking Australia’s natural resources, raw commodities, people and domestic and global markets, the Australian economy would revert to be a splintered patchwork of low-value isolated economic islands.

The efficiency of Australia’s key freight supply chains, therefore, materially impacts on our productivity performance, economic growth and living standards. Inadequate transport links raise firm costs, force excessively dispersed production (thus causing the loss of economies of scale, scope and agglomeration), create local pockets of monopoly power, and reduce the efficiency with which labour markets match job seekers and employers.

iMOVE considers that rather than focus on the productivity of specific transport modes in isolation – e.g. heavy vehicles – the Commission should recommend a broader, system-wide approach that covers the productivity of infrastructure and interconnected transport modes. iMOVE recognises that there is existing expertise within each of the three modal regulators, but considers that there are broader challenges that cannot be tackled in isolation:

- the need to consider users’ and consumers’ requirements from the transport system as a whole; and
- the need to develop new technological solutions to address rapidly growing demand for transportation services, how that demand can best be met at least cost, and how investment should be paid for.

As Infrastructure Australia and others have highlighted, on current projections and without changing the way the transport sector operates, significant expenditures will be required to expand Australia’s transport infrastructure. Train and truck operators face increasing congestion costs, which translate into higher charges and poorer services for customers. In this environment, network owners are trying to ‘stretch’ the utilisation of their networks, while truck and train operators are attempting to improve the utilisation of their assets (which also requires a better utilisation of the network).



Emerging technologies and data intensification can support a more efficient utilisation of existing assets such as limited road space in many different contexts, and generate direct cost savings, including reduced congestion costs. The ability to gather more and better data would potentially also give rise to new charging solutions that would take some pressure off government finances and at the same time provide better signals to users.

Putting in place the technologies that would enable lifting the productivity of existing assets requires a coordinated approach across jurisdictions and transport modes. These innovations require a coordinated approach that cannot currently be provided without moving towards a more coherent national approach to regulating Australia's transport network. Such a move will require engagement by all stakeholders – the modal regulators, jurisdictions, transport users and other bodies with the necessary expertise to work together to:

- identify and prioritise the technological capabilities that would support better asset utilisation and simultaneously improved flows across transport modes;
- trial and evaluate different options in order to develop the capability for an overarching data platform to gather datasets, which would in turn permit users to adopt the applications that best meet their needs;
- establish the platforms to enable the availability of open access transport data required to leverage data-driven technologies; and
- agree on the necessary consistent telemetry standards and data protocols that will need to be adopted by infrastructure managers and users to operationalise these technologies.

There will likely be some different, but also many overlapping requirements on the part of users of rail and road freight infrastructure, respectively, or of users operating in an urban environment versus those engaged in intrastate transport. Clearly, many objectives and priorities will need to be resolved. Another important consideration is that users are only likely to invest in the appropriate technologies if there is some certainty as to which future pathway will be adopted.

**Again, iMOVE considers that establishing a common governance framework under the leadership of a national transport system coordinator would offer the best path forward to enable the adoption of innovations that will benefit Australia in the longer term.**

## 4.5 Opportunities for further integration

*What are the impediments to further harmonisation within the three transport modes? What are the best options to address those impediments? What net benefits might be expected from achieving common systems and consistency?*

*Interoperability within and across the three modes is becoming more important — how might regulatory structures best support this?*

In iMOVE's view, answering these questions go to the heart of an effective future national transport reform agenda. At its core, the fundamental impediment to further harmonisation across the three transport modes is 'human made'; that is, related to the existing design and governance of the system.



In turn, this design has been constrained by many factors including Australia's Federal structure and our highly urbanised demographic structure sitting within a very large landmass.

#### 4.5.1 National System Coordinator

As is set out in this submission, iMOVE considers that the reforms required to move from the position we are in today (Point 'A') towards an integrated national transport system (Point 'B') would be best coordinated and led under the auspices of a **National System Coordinator**. Interoperable systems and technologies within and across transport modes would form a central aim of these reforms as part of the broader objective of facilitating the movement of goods and people.

#### 4.5.2 National Transport Regulator

Further, over time, the three national regulators should adopt a common governance framework and, ultimately, be amalgamated.

This proposal might seem to run against the trajectory of the reform process in Australia where, over time, specialist regulatory bodies (like the AEMC) are formed out of more general agencies such as the ACCC. However, the fundamental consideration here is how the scope of the network is defined. **This is iMOVE's fundamental point – our national transport system should be defined as such, including all of the roads, rail lines, ports, intermodal terminals and air and sea lanes.** While AEMO operates a very defined piece of network infrastructure, being the National Electricity Market.

This is not to deny the enormity of the change or the effort required to achieve these reforms. Nonetheless, it is important to set out a proposal to get 'from point A to point B', particularly since **most stakeholders agree on the ultimate form of Point B – being a more efficient and interconnected national transport system that would underpin Australia's future prosperity.**

### 4.6 Digitalisation and the use of data

*Are there other technological changes and technologies emerging with the potential to significantly affect the transport sector?*

*How should regulatory arrangements take account of technological changes and emerging technologies? Are current arrangements fit for purpose?*

*What role, if any, should existing regulators have in encouraging better use of technology and ensuring public safety?*

*What role, if any, should national transport regulators and other government agencies play in the sharing, collection, management and usage of logistical data?*

These questions essentially go to the heart of what the transport system of the future will look like, as discussed in Section 3. Our contribution in this submission has been to set out a coherent overarching regulatory framework with the aim of supporting a safe and efficient transport industry, now and into the future. In summary:

- the development of standards and platforms for the collection and sharing of safety-critical vehicle data;



- the collection of quality, up-to-date and relevant transport data to support better operational, planning and investment decisions;
- a 'system coordinator' that makes effective use of new technologies and encourages industry to do the same;
- a recognition of the systemic aspects of freight and support for a systemic approach to freight regulation that is, at its core, multi-modal;
- two-way information flow between users and the system operator; and
- the development of interoperable and standardised telemetry and other procedures.

#### 4.6.1 Freight Data Hub

As part of our recent work for the Department of Infrastructure, Regional Development and Cities, iMOVE developed three sets of recommendations related to improving the utilisation of freight-related datasets to drive productivity and efficiency improvements across Australia's freight supply-chain networks.

Below, we reproduce the set of recommendations related to the formation of a 'Freight Data Coordination Office', which the Commonwealth Government accepted and funded in the 2019-20 Budget (as a Freight Data Hub).

#### Group 2: Establishment and role of a Freight Data Coordination Office

Our second set of recommendations relates to the organisational and governance arrangements for collecting data. We recommend that:

1. A Freight Data Coordination Office be established to:
  - a. collect, host, and disseminate freight data at a national level, leaving data analysis to be conducted by relevant stakeholders according to their respective mandates, including at the state and regional level;
  - b. encourage data providers to deliver needed data compliant with established data standards; and
  - c. initiate processes to procure missing data.
2. A mechanism be established by which a steering group representative of data users and data collectors can guide the priorities of the Office to build trust in the new organisation and maintain its relevance to stakeholders.
3. The Commonwealth take a leadership role in the procurement of such 'commercial' freight related data as is needed and which exhibits good value for money. For example, if jurisdictions are separately purchasing vehicle movement data, there may be a benefit in the Commonwealth acting as a monopsony buyer of these datasets.



4. Secure protocols be established for data collection and handling that support participation and contribution from stakeholders that can supply a wide range of data sources.
5. Practical and robust arrangements be established for securing access to raw freight data from industry participants including rules relating to aggregation and public access to respect commercial sensitivity.



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