Transport regulation
Identifying opportunities for improving the regulatory environment

NZIER report to the Ministry of Transport
27 March 2015

Final – Ministry publication version
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The assistance of the Ministry of Transport, NZ Transport Agency, Civil Aviation Authority, Maritime NZ and the project Reference Group is gratefully acknowledged.
Executive summary

Seeking opportunities to improve efficiency of transport sector regulation

This report looks for opportunities to improve the regulatory environment in the transport sector.

We introduce a framework to systematically scan the existing stock of regulations and identify regulations that have a high likelihood of creating, rather than mitigating, market inefficiencies.

Regulations put in place to make transport services safer, cleaner or more efficient can become outdated, because of changes in technology, knowledge, or other factors.

However, there is no systematic approach for bringing up the existing stock of regulations for review.

This report:

- introduces a high-level framework to identify regulatory areas in transport that may need attention
- applies the framework to assess the market effects of the stock of regulations
- summarises transport case studies that consider the effects of regulations.

Framework to identify and prioritise regulations for review

We developed a framework, consisting of a range of methods, to assess the stock of existing regulatory interventions:

- systematic scanning of every existing transport regulation for regulatory style that is at high risk of creating or sustaining inefficiency (Section 3)
- assessing the economic materiality of regulations, given the size of a sector and its connectedness to other parts of the economy (Section 4)
- identifying potential gains from reform, based on international literature on the orders of magnitudes of efficiency gains from reform (Section 5)
- using this to narrow down to an initial list of priority areas and regulations for review (Section 5)
- testing findings with regulatory experts and the Ministry’s Reference Group
- undertaking a high-level Structure Conduct Performance check by transport sub-mode to check for undesirable impacts of regulations (Section 6)
- developing transport case studies (Section 7) to:
  - illustrate the application of the methodology
  - provide the Ministry evidential support in deciding whether regulatory distortions, if any, are sufficient for it to apply scarce research and policy resources to undertake a full scale review of the regulation.
Legal screening highlights a strong reliance on prescriptive rules

We screened all transport sector legislative instruments (Acts, regulations, rules) at the clause and word level to ‘quantify’ key regulatory characteristics to each type of regulation. This allowed us to identify which regulations present the highest risk of adverse effects on the efficiency of the sector.

Generally, input- or ‘command and control’-style regulations are more prone to cause inefficiency and limit innovation than performance- or outcome-based regulations.

This is not to say command and control regulations are inappropriate. That depends on the nature of problem or risk that’s being addressed. However, they are at greatest risk of becoming obsolete or counterproductive over time.

Transport regulation appears to be very command and control orientated which increases the likelihood of the potential for impacts on product market efficiency.

Figure 1 Regulatory style

![Command & Control vs Market Regulatory Style](image)

Source: NZIER

Materiality test directs focus toward road freight and aviation passenger rules

Our materiality test considered the relative economic size, growth, and interconnectedness of transport services.

In this test, road transport stands out, as it is the largest and the most interconnected mode across the economy. The risk here is that any inefficiencies in road transport filter through to other sectors of the economy, ‘multiplying’ the impact.

Aviation is less interconnected but has the highest level of end consumption – inefficiencies will have a direct impact on people who use it.

Because of their sheer size, even small inefficiencies in both these transport modes caused by regulation have the potential for material impacts across the economy. These two modes should be a starting point for further focus by the Ministry.

We tested our findings from our legal screening and materiality analysis at two workshops with a regulatory sector expert group. This provided useful sense-checking and important context in narrowing down to a list of regulations for more detailed attention.
Potential gain estimates reinforce our legal and materiality assessments

We drew on the international literature to identify ‘orders of magnitude’ indicators of potential gains from regulatory reform in the transport sector. There are however several caveats around whether the multifactor productivity gains we found in the literature can be applied to the New Zealand situation.

The high-level estimates of the value-add from efficiency gains in Figure 3 cannot be used as ‘revenue targets’. That would mean achieving on-going productivity improvements in transport markets as a result of regulatory reforms.

However, the relative impact does have important information content: it emphasises that even small expected gains can add to something substantial in large sectors (aviation passenger).
Table 1 brings all our key indicators together. Sub-sectors such as road passenger and those related to freight have a high propensity of prescriptive and ‘intrusive’ rules that are at high risk of creating inefficiencies.

A key question for future investigation is whether such inefficiency costs are (still) worth the benefits.

The sheer economic size and interconnectedness will make specific regulations in road transport and passenger aviation obvious candidates for review.

Based on the literature, the impact of reform, proportionately, appears highest in the rail and maritime sectors.

### Table 1 Potential areas for gain; summary table

<table>
<thead>
<tr>
<th>Sub-mode</th>
<th>Regulatory force</th>
<th>Materiality score</th>
<th>Gain potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road freight</td>
<td>73%</td>
<td>33%</td>
<td>3</td>
</tr>
<tr>
<td>Road passenger</td>
<td>75%</td>
<td>7%</td>
<td>3</td>
</tr>
<tr>
<td>Rail freight</td>
<td>0%</td>
<td>3%</td>
<td>5</td>
</tr>
<tr>
<td>Rail passenger</td>
<td>0%</td>
<td>2%</td>
<td>5</td>
</tr>
<tr>
<td>Maritime freight</td>
<td>65%</td>
<td>2%</td>
<td>4</td>
</tr>
<tr>
<td>Maritime passenger</td>
<td>51%</td>
<td>2%</td>
<td>4</td>
</tr>
<tr>
<td>Aviation freight</td>
<td>60%</td>
<td>4%</td>
<td>3</td>
</tr>
<tr>
<td>Aviation passenger</td>
<td>57%</td>
<td>47%</td>
<td>3</td>
</tr>
</tbody>
</table>

*Regulatory force*: the combination of regulatory characteristics scores (style, level, reach & duration)

*Materiality score*: economic output of mode relative to total sector output

*Gain potential*: points awarded (1 Low - 5 High) for potential efficiency gains, based on the literature

**Source**: NZIER

What’s going on in transport markets?

To ‘triangulate’ these findings from our screening we looked at real-world performance metrics in transport product markets using the structure-conduct-performance framework. This framework is used in competition analysis to assess the health of markets.

The main performance metric of interest is the trend in productivity over time. If this metric was running opposite to our findings we would be concerned for the methodology. Figure 4 suggests that this is not the case.

The trend of less government involvement in New Zealand transport product markets prior to 1998 was accompanied by growth in (transport) sector productivity. The trend since then has been for more government involvement, which has coincided with declining transport productivity. There are also other possible explanations for this trend. However to us it indicates the need for further analysis.
In summary

The dominant regulatory tool for transport modes is to control product market entry conditions through safety and security standards. Land and maritime also have a particular focus on the use of detailed rules to control sector production processes and equipment standards.

Transport is heavily influenced by international requirements which can limit choices around New Zealand specific modal regulation. Despite this we have significant bespoke transport rules and regulations.

There is little direct economic regulation but, because of the high levels of interconnectedness that transport has in the economy, the product market effects of unintended outcomes from regulation are likely to be indirect and pervasive across industrial sectors.

We selected ‘case studies’ to provide a range of perspectives on how our methodology could be applied. We summarise the case studies below. The application of the truck mass and dimension rules to road freight both have the potential to be material. Further study is needed to identify the scope and scale of the inefficiencies.

The application of the rules regarding truck components has proven to be more difficult to investigate with the potential inefficiencies likely smaller. This study, like the others, is part of the screening process but in this case we quickly found little opportunity for improvement.
Narrowing down to specific regulations for review

Land transport – potential for inefficiency: above average

The potential gains from regulatory change are highest from road freight in particular.

Transport regulations control firm entry and exit to a greater or lesser degree and place compliance burdens on firms that participate in product markets. There has been a sustained structural change in road transport markets, both freight and passenger, over the last 10 to 15 years.

We believe that road freight equipment rules are most likely to be causing material inefficiencies in transport because the rules are complex, highly prescriptive and bespoke – therefore, they are likely to impose binding constraints on operators that increase the capital and operational cost of road freight. Road freight transport has both one of the highest value-add and is most interconnected through the rest of the economy.

Our analysis of the detailed rules at mode and sub-mode level suggests that this inefficiency potential would likely be found in truck mass and dimension rules particularly where they are linked to permits for road use and rules that focus on vehicle components particularly where they refer to general safety provisions rather than manufacturers’ standards.

The difficulty to date in implementing regulation for high productivity motor vehicles that enables realisation of the significant estimated benefits ($187 to $322 million over 5 years)\(^1\) is an example of the complexity of removing this type of inefficiency.

Aviation – potential for inefficiency: average

Aviation (along with rail) has the lowest proportion of command and control type legal instruments of the four transport modes. The regulations are focused on:

- requiring operators to suggest methods for the management of risk and achievement of standards that are considered by the regulator
- checking that air transport operators and their service providers have the required capability to meet safety standards.

Rather than prescribe process or equipment standards the command and control elements in aviation seem to be linked to requiring operators to comply with international conventions.

Air cargo logistics operations and operators, for instance, are heavily regulated for safety and security reasons. Air cargo is used to transport more than $6 billion of high value exports from New Zealand with costs in excess of $600 million per year. The logistics chain from producers of these goods through to the market overseas has many hand-off stages and is influenced by a range of regulations both within and outside of aviation. We believe that this could represent a high risk for inefficient market outcomes. The horizontal integration of the handling of dairy and meat export containers was recently implemented for similar reasons and is expected to deliver material efficiency improvements through that logistics chain.

Also, technology changes in aviation in New Zealand are almost always driven by international standards leaving little discretion on whether to adopt these standards. But (as we understand it) there is some discretion on how technology standards are implemented, giving at least a few degrees of freedom to improve the rule changes and minimise the potential for permanent inefficiencies in product markets.

Maritime – potential for inefficiency = low

Like land transport, the maritime sector has a strong reliance on command and control instruments. Their focus is on equipment and process.

Maritime legal instruments appear to be less prescriptive than those for land transport. They are focused on the required outcomes that the equipment or processes have to deliver rather than prescribing the actual design of the element covered by the rule or regulation.

A secondary focus of the maritime transport rules is marine protection particularly with respect to avoiding and managing oil spills.

Accordingly we expect the potential for changes to legal instruments that allow greater innovation or efficiency (while still complying with international conventions) to be lower than for land transport.

Rail – not a current priority

Almost all rail regulation is contained in primary legislation that was last updated in 2005, with part of the 2005 Act command and control orientated and part involving market influencing provisions. There is no use of rules in the rail sector. The focus is on safety systems and commercial arrangements, both of which were reviewed prior to the Government buy-back of rail in 2008. We suggest that a watching brief is maintained to ensure that rail regulation remains fit for purpose.

Case studies

In applying the full methodology we identified transport market ‘case-studies’ where we saw immediate potential for material inefficiencies because of prescriptive command and control, technology-orientated regulations that had their focus on market operations.
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1. Introduction

This report looks across the whole of the transport system for opportunities to improve the regulatory environment across all modes of transport. The report:

- describes a high-level framework to identify regulatory areas in transport that may need attention
- applies a process to assess the market effects of regulations
- summarises case studies that consider the effects of regulations.

The analytical framework can be used in future to undertake similar scanning and analytical exercises over the stock of transport regulations, and those in other areas.

1.1. Why is this project important?

We focus on the stock of regulatory interventions in the transport sector. As the engine-room of New Zealand it’s very important the sector functions well and is efficient. The sector’s impact on society is larger than its 2.4% share of GDP implies. Interventions once aimed at making the transport sector safer, cleaner or more efficient can become outdated, because of changes in technology, knowledge, or other factors. Some regulations may never have been very good in the first place.

Sunset clauses are rare, which means there is no systematic mechanism to bring up regulations for review. Sometimes, regulations that no longer work or are costly to administer or comply with may be brought to the attention of policy-makers by the sector. Others can linger and unknowingly stifle innovation at a significant social cost.

Figure 5 Benefits need to offset all sources of regulatory costs

![Diagram showing benefits and costs]

Source: NZIER adapted from Victorian Competition and Efficiency Commission

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2 The Productivity Commission’s review of New Zealand’s poor productivity performance discusses the potential for improvement. An efficient transport sector is highlighted as one of the essential elements.
The relative sizes of the boxes in Figure 5 draw on the international tax literature. It illustrates that the ‘distortionary costs’ of regulations can be larger by orders of magnitude than the more visible administrative and compliance costs.³

This potential magnitude of this cost makes it important to be vigilant that the benefits of the regulations outweigh their costs. In this sense, the Regulatory Scanning Method introduced in this report complements the Regulatory Impact Analysis process used when introducing or amending legislation and regulations.

1.2. Scope of regulations in this report

When we refer to regulations we mean Acts of Parliament and Legislative Instruments (primary and secondary legislation); “Most regulations and rules, and many notices, orders, determinations, and warrants are Legislative Instruments”.⁴

We include Acts and Legislative Instruments, like regulations and rules made under the authority of an empowering Act. We exclude subordinated legislation, e.g. standards and guidance (sometimes referred to as tertiary legislation).

We also focus on the direct effects of the specific regulatory interventions although we soon discovered that there was potential for indirect product market effects, for example, when the generic legislation applies to specific domains, e.g. the Liquor Act, Occupational Health and Safety or remedies or sanctions.

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³ A typical study (for Canada) found administration costs of taxation as 0.4% of GDP (1.2% of tax revenue) and compliance costs of between 1.1% and 1.4% of GDP (3.4 - 4.3% of tax revenue) www.fraserinstitute.org/.../compliance-and-administrative-costs-of-taxation.

Distortion costs are more difficult to quantify but are generally an order of magnitude larger. Because the dead-weight cost of distortion from taxation is proportional to the square of the tax rate, it is possible for the dead-weight cost to be well in excess of a dollar for each dollar raised (between zero and $5 per dollar of taxation in New Zealand, according to John Creedy in “The Distortionary Costs of Taxation”).

2. Methodology

We used a five step mixed-method approach combining quantitative and qualitative approaches to create an integrated high-level assessment framework.

Our approach (summarised in Figure 6) involved:

- screening detailed legal provisions to identify regulations at high risk of creating or sustaining inefficiency
- assessing the potential economic materiality, drawing on economic statistics
- identifying the potential for gain from reform, based on international literature on the orders of magnitudes of efficiency gains from reform
- testing findings with regulatory experts and the Ministry’s Reference Group
- undertaking a high-level Structure Conduct Performance analysis of markets for transport sub-modes to check for undesirable impacts of regulations
- developing case studies to:
  - illustrate the application of the methodology
  - provide the Ministry evidential support in deciding whether regulatory distortions, if any, are sufficient for it to apply scarce research and policy resources to undertake a full scale review of the regulation.

Figure 6 Assessment framework

Screen all regulations for:
- Style
- Level
- Reach
- Duration

Define markets and examine materiality:
- Size & Growth
- Interconnectedness

(Report sections 3 and 4)

Map all regulations into markets:
- Identify Targets.
- Prioritise.
- Determine potential from detailed screening and focus of rules.

(Report section 5)

Experts quality assurance:
- Conduct literature search for local and international parallels and undertake a “sense making” consultation with experts and steering group.

(Report sections 5 and 6)

Are we on the right track?
- Develop case studies of potential market impacts
- High level examination of product markets.

(Report sections 6 and 7)

Quantify the potential gains:
- Materiality - Where is the money?
- Priority two - markets with potential.
- Identify potential performance gains.

(Report sections 5 and 6)

figure areas

Focus areas

Source: NZIER
2.1. Characteristics of regulation

When we screen regulations, we start by looking for their dominant characteristics. We do this because economic theory points to different regulatory approaches having different risks of adverse effects on the efficiency of the sector. The regulatory approach will affect the:

- freedom of operators to choose delivery methods or to innovate
- reliance of the regulator on its, and the sector’s, expertise or capability
- ease by which the regulator can keep rules current and relevant.

Regulations are just one tool (or institution) to influence behaviour – markets and social norms being others. They can seek to manage market transactions (economic regulation), as well as broader societal objectives (e.g. health and safety).

Figure 7 Institutions and their instruments

![Diagram showing institutions and their instruments](image)

Source: NZIER

There are also choices about regulatory approach, spanning from input- to output- or outcome- (performance) based regulation, the key types being:

- **Command and control**, emphasising prescription of what is permitted or not (command) with sanctions in case of non-compliance (control)
- **Market-harnessing** and risk-based regulation, emphasising the processes and outcomes of competition, with a focus on voluntary compliance and market-like mechanisms such as tradable permits
- **Market informing**, where the emphasis on voluntary (or compulsory) disclosure of information regarding both products themselves and the producing firm.

These regulatory approaches are ideal types and in practice we see a mix.

**Ideal approach is informed by the nature of the risk**

The choice of approach can be matched to the nature of problem or risk being addressed (i.e. considering incentives on actors, information available to consumers...
and regulators, ability to prevent or address any harm, etc.). This problem definition should inform the choice of instruments – rules, incentives, and/or information.

Accordingly, we cannot have a predetermined view of what the approach should be. But this context is important as part of the assessment of the impact of the specific regulations, and identifying the alternatives that may be available.

This is the reason why, in this report, we screen regulation to look for the dominant regulatory mode (Table 2) as one of the data points informing the likelihood of inefficiency.

### Table 2 Characteristics of regulations as inefficiency indicator

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Focus (spectrum)</th>
<th>Why an indicator of potential inefficiency?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style</td>
<td>Means vs ends</td>
<td>Input focus or limited discretion gives certainty, but inhibits choice and innovation if regulation locks in technology, processes, or providers</td>
</tr>
<tr>
<td>Level</td>
<td>Act vs regulation/rule</td>
<td>Acts tend to be more difficult to change than rules, and so inhibit beneficial change</td>
</tr>
<tr>
<td>Reach</td>
<td>Operator defined solutions vs component part standards</td>
<td>Regulation of component parts requires regulator to understand impacts of component rules (usually technology orientated) on markets over time</td>
</tr>
<tr>
<td>Duration</td>
<td>Static vs adaptive requirements</td>
<td>Do regulations allow providers to adapt their services or processes to changes in tastes, technology etc.?</td>
</tr>
</tbody>
</table>

Source: NZIER

Sometimes regulatory change is forced on New Zealand, and we acknowledge that regulatory options can be limited in those situations.

New Zealand regulators are exposed to global factors, including the internationalisation of policy, technology developments and changes in global value chains. New Zealand cannot affect these global forces of change in any significant way, although it can choose how to respond.

For example, New Zealand has a seat at the table with limited ability to shape the regulation of international aviation and shipping. Once agreed, New Zealand has little choice but to adopt them for international services. However, we may be able to choose how to apply them to domestic aviation and shipping. This also goes for road and rail transport, where technology and technical standards are developed overseas, but we have some degrees of freedom in what we adopt domestically, or how or when.

### 2.2. Approach to screening legal instruments

Our overall method was to scan legal instruments to identify the dominant style of regulatory intervention and to define the characteristics of each style.

We then undertook a clause-by-clause examination of the regulatory interventions to identify and ‘quantify’ their style, level and reach, and duration.
This provided one of the data points on the potential for adverse market impacts, because the regulations might be unduly constraining or otherwise impacting sector activity.

**Database searching**

We had to design a new, innovative screening process that was tractable and systematic.

The legislation, regulations and rules were loaded into seven searchable databases:

- for each of air, land transport and maritime modes, one for the legislation and regulations, and one for the rules
- one database for rail legislation and regulations (no rules in rail).

We systematically searched for words to classify the instrument by type (see Section 2.1), style and reach, using an iterative process:

- develop a list of key words associated with different styles of regulation, based on the review of the literature and expert advice
- search the database tables clause-by-clause for these words, counting how often they occurred (for relevance within instrument) and whether they appeared separately or together in instruments or clauses (to identify if they are a good discriminator of different styles)
- search the database tables word-by-word to identify and count which root words appeared in each instrument to provide a bottom-up check of the coverage and discriminatory power of the thesaurus based on the words actually used in the instruments
- discuss the results of this database analysis with the Ministry’s expert advisor, amend the words in thesaurus, and repeat the process until there was strong agreement between the top-down and bottom-up approach.

We also analysed the timing of changes to the legislation and regulations to compare the durability of legal instruments across mode.

**Rules**

This scanning identified that some legislation and regulations prescribe conditions for ‘use and operations’ in particular transport modes. However, most of the legislation and regulations seemed to have a particular focus on enabling the transport regulators to make ‘rules’. Because of this, we also classified the coverage and focus of the rules for each mode (for example, was the target equipment, operations, certification or licensing).

**Insights**

The screening process provided us with a quantitative picture of the style and objectives of the stock of instruments by mode.

The key insights from this overview are:

- the regulatory style for each mode (land, air, sea, rail) is different
• air and maritime regulatory interventions focused on requiring operators to suggest and implement particular operating processes (reflecting the need for domestic regulators to ensure compliance with international air and maritime conventions)
• through a mixture of compliance with manufacturer standards and bespoke safety specifications, land transport regulatory interventions focus on prescribing the standards for both transport vehicles and for the components of vehicles across different vehicle types
• the screening process allowed us to identify instruments that may be constraining or distorting markets but could not indicate whether this was indeed the case or causing inefficiency
• changes to legislation and regulatory interventions were more common in land than the other modes.

The picture of the stock of legal instruments (including focus, coverage and complexity) was presented to expert regulators from each of the four modes for their comment and interpretation. These discussions indicated our picture of the stock was broadly consistent with their overall impressions.

2.3. Approach to testing for materiality

To help prioritise, we used economic data from Statistics New Zealand’s System of National Accounts (SNA) to identify whether a particular transport market was material.

We did this by estimating the size of each sector, the relative rate of growth by sector between 2000 and 2010, and constructing an interconnectedness metric – the proportion of transport services used as inputs by each of the sectors.

Where available we also used administrative data to assess the economic materiality for each sub-mode (e.g. road freight/road passenger).

Economic materiality is important but sheer economic weight is not allowed to dominate the analysis. It is just one of the inputs into our assessment. We consider both the proportionate and absolute size of the potential distortion.

Our research reflects, and complements recent work, of the New Zealand Productivity Commission which had a focus on aspects of transportation; the importance of transport in the economy with separate investigations into the performance of ports and shipping within the economy, and an extensive review of the performance of the services sector. They are also currently investigating the efficiency and effectiveness of the regulatory environment.\(^5\)

2.4. Drawing up a preliminary priority list

Thus far, the methodology has identified indicators of the potential for inefficiency (characteristics of the regulation) and the materiality of the potential effect (market size data).

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\(^5\) NZPC, International freight transport services April 2012; Draft Regulatory institutions and practices, March 2014; OECD research, Low innovation and weak international connections limit productivity, April 2014.
The next step was to find an indicator of the size of the potential gain from reform in different modes. We undertook a literature review to identify plausible values for the potential efficiency gain. We looked at evidence of changes in product market performance on both a one-off basis and over time.

This indicator of gain is not a prediction; it can only give an insight into the potential gain relative to focusing scarce policy resources elsewhere.

We then combined the evidence in a matrix that used weightings of:

- regulatory style and reach (with each mode and sub-mode ranked relative to the potential for product market inefficiencies)
- economic output by sub-mode in absolute dollars\(^6\)
- potential efficiency gains over time at sub-mode level (productivity gains estimated from evidence from international regulatory reforms).

The output from the matrix was a quantitative ranking of the present value of the potential performance gains over the next 15 years, in $ terms, at sub-mode level.

### Identifying the priority list

If we had identified a mode or sub-mode where the style, reach, level and duration of its regulatory interventions suggested a high potential for market inefficiencies, and the mode or sub-mode was significant in an economic materiality or interconnectedness sense, then it was placed in a priority list for further evidence gathering and consideration for a case study.

### 2.5. Sense-checking the results

We are not aware of any previous primary research into the impacts of an existing stock of regulatory interventions. It is thus important that the results be ‘triangulated’ as best as possible.

To provide feedback on the research and to test the research findings, the Ministry of Transport organised a reference group of senior Ministry personnel and two outside ‘peer review’ experts. We also used our own in-house QA processes to review the method and findings as the research progressed.

We tested our findings with transport regulators but not industry (which was out of scope for this project) – to ensure findings were consistent with the New Zealand transport environment.

We presented output data at a workshop where participants reacted to our initial findings and contributed to explaining why these findings occurred. We conducted a second expert workshop to present additional findings and to gather feedback on our choice of focus areas and the candidate case studies, for consideration and inclusion.

---

\(^6\) We also examined the spill-over impacts of the potential efficiency gains on each sub-mode using the NZIER CGE model. This analysis identified both the impacts across other industrial sectors based on mode interconnectedness and the accumulation of performance improvements across the whole economy. If improvements in transport sector can be sustained over time the potential spill over gains are material.
2.6. Potential by sub-mode and case studies

A final step in the screening and testing process is to consider the potential for gains within the context and realities of specific ‘markets’ or sector segments. For this we need to analyse the impact on sub-modes such as passenger aviation or freight aviation – the segments one level below modes (aviation, land transport, etc.).

We start from the standpoint that regulations seek to address a market imperfection (putting aside the strands from public choice literature that suggests that regulation might be used to pursue or entrench market power, causing welfare losses).

In that case inefficiency stems from regulations becoming out of date, as technology and other circumstances change, from being poorly designed at the outset or from the regulations inadvertently creating market power (for example, by putting in place entry barriers).

This means that, in addition to the specifics of the regulation, we also need to look at whether and how regulations impact on the structure of the market, the conduct of market participants, and ultimately the performance of the market. Figure 8 summarises the well-established Structure Conduct Performance (S-C-P) framework we use to do this.

Figure 8 Structure-Conduct-Performance framework

The selection of which S-C-P indicators to consider was guided by the work of the OECD which has investigated the linkages between sector regulation and product market performance. Although they do not define a causal relationship between market inefficiencies and regulation, the OECD work has identified that regulations which impinge on market competitiveness reduce market efficiency. This is the fundamental proposition for the research that we report on here.

The S-C-P framework has been widely used in economics as an analytical tool. The basic assumption of the model is that the market structure determines, or at least has a strong influence on conduct, which in turn influences performance of the industry.

The advantage of this approach is that very different industries can be evaluated by applying a general model. More importantly, it also shows:

- how the unique and individual characteristics of the transport industry impact on economic behaviour in that industry (i.e. specifically on structure, conduct and performance)
- the interconnection between various parts of the industry (i.e. changes to one part of the industry will impact on structure, conduct, and performance).

There are, however, a number of criticisms of the model:

- the S-C-P framework was over elaborate since the competitive market adequately explained most market behaviour and outcomes
- the model assumes causal linkages that might not always have been established empirically, and for being uni-directional in its focus.

In response to the latter criticism, we modified the S-C-P model to include feedback effects (included in Figure 8). These feedback effects have been added to recognise that the behaviour of firms and performance outcomes within industries can themselves alter market structure – whether it is because of mergers between rivals, statutory protection, or the increased costs of complying with government regulation.

This recognises that all businesses operate in a dynamic setting and respond directly to changes in that setting. When the cost to do business imposed by government increases, it will impact on the way businesses operates.
3. Findings from legal screening

3.1. Style

Command and control was the dominant regulatory style across all transport modes (Table 3).

Differences between the transport modes are not large, although land transport stands out the most. Our analysis shows the prescription in the land transport rules is more detailed and complex than in the maritime rules, for example.

<table>
<thead>
<tr>
<th>Mode split</th>
<th>Land</th>
<th>Aviation</th>
<th>Maritime</th>
<th>Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command and control</td>
<td>65%</td>
<td>48%</td>
<td>57%</td>
<td>48%</td>
</tr>
<tr>
<td>Market informing</td>
<td>25%</td>
<td>25%</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td>Market harnessing</td>
<td>10%</td>
<td>26%</td>
<td>15%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: NZIER

The patterns contrasted with our expectation. We expected to see more command and control style of intervention in aviation and maritime, where international standards dominate.

Regulatory and economic theory suggests that command and control style regulations are more likely to cause inefficiency and limit innovation. This is especially so where the services being regulated are complex, subject to rapid technological change and/or there is a wide variety of methods of delivering the service.

Land transport is therefore the main candidate, at this point, of being at risk of having inefficiency-causing regulations.

3.2. Level of intervention

Using the relative number of key words by mode gave us a measure of the level of legal instrument (Table 4).

<table>
<thead>
<tr>
<th>Instrument type</th>
<th>Land</th>
<th>Aviation</th>
<th>Maritime</th>
<th>Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acts</td>
<td>28%</td>
<td>24%</td>
<td>23%</td>
<td>93%</td>
</tr>
<tr>
<td>Regulations</td>
<td>7%</td>
<td>2%</td>
<td>2%</td>
<td>6%</td>
</tr>
<tr>
<td>Rules</td>
<td>65%</td>
<td>74%</td>
<td>74%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: NZIER
Land, air and maritime all followed similar models with a high reliance on rules and almost no use of regulations. Rail was the exception with almost complete reliance on legislation and virtually no use of rules.

The reliance on rules implies a more flexible and responsive regime than would be the case with reliance on Acts, and to a lesser extent regulations, which would be more difficult to change rapidly.

The level of intervention does not in itself tell us about the (in)efficiency of the specific instrument. And responsiveness does rely on there being good mechanisms in place to identify and review rules that may have become inefficient.

### 3.3. Reach

An important finding was that transport regulatory style does not determine regulatory reach (Table 5):

- **Land transport** – focus on vehicle and component standards and under what conditions vehicles are used to deliver transport services
- **Aviation** – focus on systems specifying how equipment is operated, and who is allowed to operate them
- **Maritime** – combined focus on equipment safety requirements and on ensuring operators have processes and capability to operate ships safely
- **Rail** – focus is on safety systems across the rail network.

The finding that rules were the dominant regulatory instrument caused us to look carefully at the reach of these rules in the different modes.

#### Table 5 Reach of rules

<table>
<thead>
<tr>
<th>Rule focus</th>
<th>Explanation</th>
<th>Land</th>
<th>Aviation</th>
<th>Maritime</th>
<th>Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>General regulations by mode</td>
<td>16%</td>
<td>8%</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Equipment</td>
<td>Rules for specific equipment</td>
<td>57%</td>
<td>5%</td>
<td>51%</td>
<td>N/A</td>
</tr>
<tr>
<td>Operating</td>
<td>Defines operating conditions</td>
<td>15%</td>
<td>41%</td>
<td>38%</td>
<td>N/A</td>
</tr>
<tr>
<td>Operator</td>
<td>Directs operators behaviour</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Certification</td>
<td>Controls operator entry to markets</td>
<td>0%</td>
<td>21%</td>
<td>5%</td>
<td>N/A</td>
</tr>
<tr>
<td>Related services</td>
<td>Rules relating to support services</td>
<td>0%</td>
<td>10%</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Certification-</td>
<td>Controls operations of service organisations</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Licensing</td>
<td>Rules for licensing people to participate in markets</td>
<td>7%</td>
<td>11%</td>
<td>6%</td>
<td>N/A</td>
</tr>
<tr>
<td>License</td>
<td>Rules for licensing organisations to participate in markets</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: NZIER

---

7 Because the rail sector does not use rules we have excluded this from the table.
The differences in reach of instruments by mode would reflect the different risks and objectives that regulators sought to address when making the regulations.

As noted earlier, choices around instruments affect the freedom for the market to innovate, the reliance of the regulator on the expertise and capability of participants in the market and the type of problems the regulator faces in keeping the rules current and relevant.

The regulatory approach to aviation and, to a lesser extent maritime, reflect markets with a small number of competent operators that can be clearly identified, using equipment where manufacturers set acceptable standards for both the equipment supplied and its maintenance.

The approaches also reflect the requirements for air and maritime regulators to align their approaches with international conventions.

The approach to land transport rules reflect markets with a large number of operators of varying levels of capability, so that the most accessible point of control are the safety and performance standards of the vehicle and how it is used.

3.4. Duration

The durability of regulation can be impacted by a number of factors, ranging from the need to respond to changing sector conditions, one-off events driving political interventions through to changing technology driving the need for updates to detailed rules. Our examination of updates to transport regulations since 1990 describes an increase in the rate of updates over the period (Table 6).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acts (5)</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Regulations (11)</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Rules (1)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acts (6)</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Regulations (6)</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Maritime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acts (7)</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Regulations (10)</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acts (1)</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Regulations (2)</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Source: NZIER

Because the rail sector does not use rules we have excluded this from the table.
Prescriptive rules however do provide a form of certainty for investments and make enforcement easier which impacts effectiveness.

### 3.5. Summary findings from legal screening

On the basis of the legal screening alone, land transport appears to be the strongest candidate for a search for legal instruments that create inefficiencies because:

- land transport legal instruments have the strongest tendency toward command and control style of the four modes
- the emphasis on equipment and equipment components suggests a level of detail and prescription that increases the risk of rules:
  - not keeping pace with changes in technology
  - reducing the scope for, and raising the costs of, innovation
- land transport is much less constrained than air or maritime by the need to apply international conventions to local operators.

#### Figure 9 Summary assessment from legal screening

<table>
<thead>
<tr>
<th>Mode</th>
<th>Focus</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land transport</strong></td>
<td>prescriptive focus (C&amp;C)</td>
<td>equipment/behaviour</td>
</tr>
<tr>
<td></td>
<td>hard wired in Leg and rules</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rigid rule structures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aviation</strong></td>
<td>systems focus</td>
<td>operating conditions</td>
</tr>
<tr>
<td></td>
<td>adaptive to technology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>international standards driven</td>
<td></td>
</tr>
<tr>
<td><strong>Maritime</strong></td>
<td>design &amp; safety focus</td>
<td>operating conditions/hazards</td>
</tr>
<tr>
<td></td>
<td>process driven</td>
<td></td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td>safety systems focus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>self regulation</td>
<td></td>
</tr>
</tbody>
</table>

*Source: NZIER*
4. Findings on materiality

The purpose of the economic materiality filter is to quantify the absolute size, relative growth and interconnectedness of the transport sector in the New Zealand economy.

4.1. Economic data

We drew on the National Accounts for Gross Domestic Product (GDP) data by industrial sector from 2000 to 2011 and the latest Input-Output (IO) table.\(^9\)

The IO table structure shows how particular industries ‘fit’ into the wider economy, in particular their use of factors of production (e.g. labour and capital), how different parts of the economy connect to other parts (e.g. the supply of intermediate goods by one sector to another), and who consumes the final outputs (households, firms, government).

We used the IO table to quantify the interconnectedness by mode of transport between different sectors of the economy.

We also provide indicators of economic growth by sector for both static and dynamic views of economic linkages.

We report on several measures when considering the economic significance of transport and transport modes given where and how transport services are used in the economy:

- share of GDP indicates the relative economic size of the transport mode
- output shows the absolute value of sales by mode and sub-mode
- the mode’s value added shows the absolute value that is created by each mode.

4.2. Transport’s place in the economy

Our first level disaggregation of the transport sector is to define ‘product markets’ at the mode level (Table 7).

Road transport and aviation are the largest modes by value and hence immediately identify as potentially material, as even small inefficiencies may have large impacts.

All four modes have strong backward linkages to other sectors of the economy (fuel, warehousing, professional services, etc.), with 40-50% of outputs accounted for by inputs from other sectors. This could matter if regulations unnecessarily constrain, or have a bias toward, those supplying sectors.

---

\(^9\) The latest Input-Output tables were released in 2012 by Statistics New Zealand for the year 2007. NZIER updated this Input-Output table to 2012.
Table 7 Transport markets – output, value added, and share of GDP

<table>
<thead>
<tr>
<th>Transport mode</th>
<th>Output $m</th>
<th>Value Added $m</th>
<th>VA / Output</th>
<th>VA relative to road VA</th>
<th>Share of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>$6,795</td>
<td>$2,855</td>
<td>42%</td>
<td>1.0</td>
<td>1.4%</td>
</tr>
<tr>
<td>Aviation</td>
<td>$4,842</td>
<td>$1,182</td>
<td>24%</td>
<td>0.4</td>
<td>0.6%</td>
</tr>
<tr>
<td>Maritime 10</td>
<td>$844</td>
<td>$437</td>
<td>52%</td>
<td>0.2</td>
<td>0.2%</td>
</tr>
<tr>
<td>Rail</td>
<td>$510</td>
<td>$281</td>
<td>55%</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total</td>
<td>$12,991</td>
<td>$4,755</td>
<td></td>
<td></td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Note: See Appendix C for compositional definitions

Source: Statistics New Zealand, NZIER

The same goes for the output side, where most of the output from road and rail, and less so maritime, goes into the production of goods and services of other sectors (Figure 10). Any regulations that are inefficient can have direct adverse effects for the transport modes, and indirect effects via the sectors that rely significantly on transport.

Adverse effects would also impact on other consumption in the four transport markets – such as exports (especially aviation) and final consumption by households and government.

Figure 10 Transport market - composition of outputs
2011 $m

Source: Statistics New Zealand, NZIER

---

10 Maritime transport as defined here includes sightseeing transport, as it was not possible to disaggregate this with the data supplied by Statistics New Zealand.
4.2.1. Transport links to other sectors

Inter-industry linkages are the intermediate transactions that take place between sectors of the economy. Nearly 60% of transport sector outputs are used as domestic inputs elsewhere.

Appendix D summarises transport linkages backwards (input-side transactions) and forwards (output-side transactions). These linkages are common across the four modes.\(^{11}\)

Figure 11 below combines this data on linkages with sector growth estimates from Figure 31 in Appendix D. This information offers a further filter to identify priorities for regulatory instruments that may need attention. In particular, regulations that cover high growth sectors should be prioritised, on the basis that small efficiency gains can have major impacts.

However, this is a filtering approach on the basis of what we see at this time. We cannot observe whether some industries are low growth because they are being held back by transport regulations, for example, suggesting that attention should be on unlocking potential growth in low growth segments.

Figure 11 Material transport sector linkages

![Graph showing material transport sector linkages](image)

Source: NZIER

4.3. The next layer down: sub-mode analysis

We defined eight sub-markets by disaggregating each transport mode into freight and passenger markets.

Analysis of the transport sector at the sub-mode level also provides a more granular concordance between the materiality and legal filter.

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\(^{11}\) Appendix D is set up so that interested readers can consider the detailed quantitative analysis of the size, interconnectedness and growth of transport and sectors in the New Zealand economy.
4.3.1. Transport sub-modes

Total output by transport at sub-mode level is shown in Figure 12.\textsuperscript{12} Road transport freight, road passenger and air passenger transport represent 87\% of the total output of the combined sector.

That does not mean that these markets should be the sole focus for further review: small sub-sectors may be an indication of frustrated growth, for example. This is just one data point and there may be important inefficiencies that need to be addressed in other product markets with smaller outputs levels.

The total output of air transport at the sub-mode level is higher than at the mode level because this data set includes the use of other airlines.\textsuperscript{13} Air passenger services category also includes $2.9b of charges for imported aviation fuel.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure12.png}
\caption{Sub-mode transport sectors’ output 2007; $m; basic prices}
\end{figure}

\textbf{Source: Statistics New Zealand, NZIER}

\textsuperscript{12} The dataset used to describe the transport sector at the mode and at the sub-mode level are different. Therefore, there is not perfect concordance of numbers.

\textsuperscript{13} Aviation imports at the mode level include imports for the domestic aviation services but excludes aviation services from overseas providers.
A breakdown of final consumption at the sub-mode level further highlights the utility of the disaggregation process. It helps to highlight where to focus the attention of analysis of the impact of regulations (Figure 13).

Figure 13 Sub-mode transport sectors’ final consumption
2007; $m; basic prices

Source: Statistics New Zealand, NZIER

To help prioritise regulations for attention we can also explore linkages to other sectors at sub-modal level. For example, road transport freight is an important input to New Zealand’s largest exporting industries – Dairy, Meat and Forestry.

4.4. Conclusions from materiality analysis

The purpose of this section was to provide metrics of materiality, to supplement the legal screening. We now have two data points to assess the risk that a regulation could be distortionary, and the likely materiality of that. Key conclusions are:

- most of transport’s outputs go to other sectors as inputs – this is important as the cost of any inefficiencies can have large indirect impacts
- the more intensive users of transport services are larger contributors to GDP and record steady growth rates (Appendix D). Small regulatory efficiency gains can have large impacts in these sectors
- road freight is a major input into the large manufacturing and export-orientated sectors. This interconnectedness, when combined with the nature of the regulatory interventions in this particular market, highlights this area as a priority for further investigation
- aviation passenger services also warrant attention due to its sheer size
- our economic materiality test is just one data point. It is vulnerable to overlooking some areas of inefficiency – size is not everything; a small slow growing industry is potentially a signal of undue constraint by regulation.
5. Identifying potential gains

This section considers the potential gains from regulatory reform in transport, drawing on the international literature.

We combine these findings with results from the legal screening and the materiality indicators to prioritise which regulations to put on the review work-programme.

Together these indicators will identify regulations with the highest potential to generate productivity improvements in the transport sector.

5.1. Research on transport sector reform

Our approach was to review the literature on the productivity impacts of regulatory reform in transport, and using this material to estimate the economy-wide impacts of reform.

We acknowledge the obvious issues with adopting estimates from international studies: the opportunities for regulatory reform may not be the same, there are differences in the economy (structure, scale), and there are also institutional differences which could impact on the effect of regulation.

We are comfortable with that assumption as our examination of indicators of government involvement on product markets shows there has been some increase in the extent of regulation, use of command and control regulation and government control of firms in the last 10-15 years (see Appendix E for a brief review of regulatory trends in transport in New Zealand).

The overall limitations are acknowledged, but we proceed on the basis that our objective is solely to generate ‘orders of magnitude’ estimates of the potential gains from regulatory reforms in different transport markets. These estimates are not forecasts.

5.1.1. Estimates of potential productivity gains

There is clear evidence from OECD work that high levels of regulatory intervention are more likely to have a negative effect on competition, and hence on dynamic efficiency.\textsuperscript{14}

The literature finds sustained improvements in productivity in a number of countries following reform of transport product market regulation.\textsuperscript{15} Gains are made not just from the immediate one-off gains but also from dynamic improvements as the transport markets adjust over time. The range of studies on the market impacts from transport regulations is considerable and they all provide insights of one sort or another.

\textsuperscript{14} Refer OECD series of research papers on product market regulation, and associated resources at: http://www.oecd.org/economy/growth/indicatorsofproductmarketregulationhomepage.htm

\textsuperscript{15} For example, see the extensive reviews undertaken at MIT: Transportation@MIT – US Transportation productivity study ‘Competition and productivity in the US trucking industry since deregulation’ (Parming, 2013).
Some studies, such as the MIT and NERA studies that we referenced are detailed and data driven while others report on research at a higher level. Road passenger transport studies are generally EU and UK based while airlines studies are US orientated covering both dedicated carriers (UPS and FEDEX) combination passenger and freight carriers. In this way performance gains that are relevant to New Zealand conditions were able to be identified. Road transport studies are also conducted in detail in the US and distinguish between full truck and part load operations, as well as operators who consolidate truckloads.

Many of these studies are current and quite recent while a number extend their data analysis back to the time of deregulation in the particular market. In this way we were able to examine how the performance gains were or were not sustained over time and how they were influenced by sector cycles or broader economic conditions. In the end we selected the potential productivity growth numbers as ‘orders of magnitude’ point estimates from a synthesis of good quality studies of what could be sustained over time.

Drawing on the literature, we summarise typical improvements in productivity (Table 8). Efficiency gains are expressed in multi-factor productivity (MFP) terms. This captures the impact of changes in the combination of capital, labour, technology, etc. on outputs.

Table 8 Multi-factor productivity growth potential from reform

<table>
<thead>
<tr>
<th>Mode</th>
<th>Annual MFP growth</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>1.85%</td>
<td>Australian Bureau of Infrastructure, Transport and Regional Economics reports average MFP gains of 1.6% p.a. following regulatory reforms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US Trucking Industry studies from MIT identify MFP gains of average 1.7% to 2.0% pa in the 20 years following deregulation</td>
</tr>
<tr>
<td>Rail</td>
<td>6.0%</td>
<td>ISCR identify 6% average gains from their long run study of NZ Rail. Other studies also report large gains</td>
</tr>
<tr>
<td>Maritime</td>
<td>3.2%</td>
<td>Average gains recorded across several studies of ‘other’ freight</td>
</tr>
<tr>
<td>Aviation</td>
<td>1.80%</td>
<td>MIT identified MFP of air passenger up to 5.3% and air cargo up to 2% pa. We adopt a conservative number for New Zealand conditions</td>
</tr>
</tbody>
</table>

Source: NERA (2008), New Zealand Institute for the Study of Competition and Regulation Inc. (1999), Parming (2013)

5.1.2. What would be economy-wide effects?

We used the NZIER computable general equilibrium (CGE) model to simulate the growth in economic activity (GDP) that could occur in both the transport sector, and across the economy, if the MFP gains for each mode could be realised.
The CGE model is a rich representation of the whole economy and its web of interconnections. Its strength is that it tracks how changes in one part of the economy flow through into other parts.

For example, if the transport sector becomes more productive, due to, for example, regulatory reform, then the sector will grow. So will all the sectors that supply inputs or use transport services. The model takes into account that this means that resources and activity will be drawn from other sectors, as resources are limited.

We examined the impact of improved performance in the transport sector on the rest of the economy. Table 9 shows the indirect effect of the same level of increase in transport efficiency on other sectors.

**Table 9 Industry growth due to an increase in transport efficiency**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Road</th>
<th>Rail</th>
<th>Maritime</th>
<th>Aviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry and logging</td>
<td>0.13%</td>
<td>0.02%</td>
<td>0.02%</td>
<td>0.01%</td>
</tr>
<tr>
<td>Petroleum and coal product manufacturing</td>
<td>0.15%</td>
<td>0.03%</td>
<td>0.02%</td>
<td>0.07%</td>
</tr>
<tr>
<td>Fruit, oil, cereal and other food product manufacturing</td>
<td>0.11%</td>
<td>0.05%</td>
<td>0.02%</td>
<td>0.03%</td>
</tr>
<tr>
<td>Dairy product manufacturing</td>
<td>0.06%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Meat and meat product manufacturing</td>
<td>0.06%</td>
<td>0.02%</td>
<td>0.01%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Residential building construction</td>
<td>0.03%</td>
<td>0.02%</td>
<td>0.01%</td>
<td>0.01%</td>
</tr>
<tr>
<td>Other store based retailing; non-store and commission based retailing</td>
<td>0.11%</td>
<td>0.05%</td>
<td>0.02%</td>
<td>0.03%</td>
</tr>
<tr>
<td>Other goods and commission based wholesaling</td>
<td>0.06%</td>
<td>0.08%</td>
<td>0.00%</td>
<td>0.01%</td>
</tr>
<tr>
<td>Postal and courier pick-up and delivery services</td>
<td>0.05%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.07%</td>
</tr>
<tr>
<td>Scientific, architectural and engineering services</td>
<td>0.03%</td>
<td>0.01%</td>
<td>0.02%</td>
<td>0.16%</td>
</tr>
<tr>
<td>Central government administration and justice</td>
<td>0.03%</td>
<td>0.02%</td>
<td>0.01%</td>
<td>0.01%</td>
</tr>
</tbody>
</table>

Source: NZIER

Figure 14 shows the relative magnitude of performance gains in the transport modes. Unsurprisingly, road transport records the largest gain through a combination of the magnitude of the productivity growth and the larger size of the sector.
5.2. Drawing it together at sub-mode level

We now summarise the three key factors to help narrow down to specific areas and individual regulations within those areas.

Table 10 brings together summary measures from legal screening, economic materiality, and reform potential. The column headed ‘regulatory force’ is a synthesis of the regulatory style, level and reach analytics. We use a single number that represents the impact (or force) that the regulations can have on the product markets.

A higher percentage can be interpreted as more intensive, prescriptive command and control type of regulation and thus greater risk of product market inefficiencies.

Table 10 Potential areas for gain – data inputs

<table>
<thead>
<tr>
<th>Sub-mode</th>
<th>Regulatory force</th>
<th>Value added $m</th>
<th>Output $m</th>
<th>MFP annual growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road freight</td>
<td>73%</td>
<td>$2,350</td>
<td>$4,727</td>
<td>1.85%</td>
</tr>
<tr>
<td>Road passenger</td>
<td>75%</td>
<td>$505</td>
<td>$1,015</td>
<td>1.85%</td>
</tr>
<tr>
<td>Rail freight</td>
<td>0%</td>
<td>$170</td>
<td>$387</td>
<td>6.0%</td>
</tr>
<tr>
<td>Rail passenger</td>
<td>0%</td>
<td>$110</td>
<td>$251</td>
<td>6.0%</td>
</tr>
<tr>
<td>Maritime freight</td>
<td>65%</td>
<td>$264</td>
<td>$333</td>
<td>3.2%</td>
</tr>
<tr>
<td>Maritime passenger</td>
<td>51%</td>
<td>$173</td>
<td>$218</td>
<td>3.2%</td>
</tr>
<tr>
<td>Aviation freight</td>
<td>60%</td>
<td>$86</td>
<td>$527</td>
<td>1.8%</td>
</tr>
<tr>
<td>Aviation passenger</td>
<td>57%</td>
<td>$1,096</td>
<td>$6,745</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Source: NZIER

To help in the prioritisation effort, we then estimated the present value (PV) of potential gains assuming that the levels of performance improvements can be maintained.
The results are an indicator of the strength of potential gains, not forecasts. We also caution that the numbers do not take account of the impact on other parts of the economy (as CGE would).

Figure 15 shows the potential gains at sub-mode level from the analysis, using the value added measure, and the Total Output measure (the latter capturing the importance of economic interconnectedness).

In summary, based on the analysis of regulatory force and PV, the initial focus should be on regulations in road freight and road passenger services, and the aviation passenger markets.

These product markets had the highest regulatory force measure, and measures of substantial potential gain (materiality + MFP).

This accumulation of evidence from the scan and research phase of this work suggests to us that there is material potential for market inefficiencies.

The combined and merged findings suggest that regulatory interventions in land transport freight and passenger and aviation passenger markets, stand out as having a higher probability for product market inefficiencies and hence could offer the best
opportunities for performance improvements. Table 11 summarises our assessment.

Table 11 Summary assessment

<table>
<thead>
<tr>
<th>Finding by section</th>
<th>Land freight</th>
<th>Land passenger</th>
<th>Rail freight</th>
<th>Rail passenger</th>
<th>Maritime freight</th>
<th>Maritime passenger</th>
<th>Aviation freight</th>
<th>Aviation passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of C&amp;C</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on Rules</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Reach</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 4</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Linkages</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output $</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact across economy</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Section 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: NZIER

A number of factors suggest to us that maritime could probably be included as well to contribute to the assessment of the combined impact of regulation on the multi-modal market.

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16 Once the higher priority sectors are identified for further study, the scope of the work should include a number of lines of enquiry including whether market structure is causal in any inefficient outcomes and whether regulation is causal in that structure.
6. Sub-mode market analysis

Section 5 discussed our analysis and findings at an aggregate transport sector level and reviewed specific transport markets. Here we drop down from the overall market level and describe our analysis by sub-mode markets.

We review each market as follows:

- context – a description on how the transport mode fits in the New Zealand economy and the relevant markets
- existing regulatory structure – how it operates, why it is like this and our assessment overall
- the conditions for product market inefficiencies – what we expect to see
- a review of specific S-C-P indicators for each sub-market.

In Section 2.6, we described the use of the S-C-P framework to examine indicators of potential distortions at sub-mode level. We use it in this section to ‘triangulate’ our findings from Sections 3, 4 and 5. If we do not see S-C-P evidence of poor market performance, then this would call into question whether the regulations we identified from this methodology could be constraining the market in some other way.

If we do see evidence of poor market performance then we consider that further analysis is needed to check whether this performance is caused somehow by regulations, or whether it reflects other influences (such as cyclical factors, broader secular trends or temporary disruptions from major technological adjustments).

This part of the methodology will again be high-level, as it is part of the screening and identification function of the framework. When all or most of the indicators (legal, materiality, gains and performance) line up, this would be the clue to allocate resource to the regulation(s) in question and undertake more detailed analysis.

6.1. Land transport

Land transport is defined as those transport modes that are regulated under the specific instruments that the primary regulator (NZ Transport Agency) enforces – primarily road freight and road passenger. Private motorists are also included as far as they are affected by regulations but the economics of the private vehicle fleet are out of scope here. Rail is reviewed under its own section.

6.1.1. Context

Land transport dominates the transport sector in New Zealand in terms of all types: vehicle numbers; freight moved; the reach of the road network; and the level of economic output.

Land transport intersects with most sectors of the economy, is heavily interconnected as an intermediate input and has high rates of final consumption,
especially in households. Along with maritime, land transport dominates the import and export trade.

Economic regulation of land transport was removed progressively from the 1980s and sharp performance improvements resulted from those initiatives. Since the late 1990s, regulation has slowly increased, mainly in the form of prescriptive rules. This reflects increasing social expectations re safety and environmental protection. This has increased the regulatory burden.

6.1.2. Regulatory structure

Land transport regulation is dominated by the use of command and control style of instruments as shown in the following Figure 16 on the classification of land transport rules by style.

Figure 16 Regulatory style and level – Land transport

<table>
<thead>
<tr>
<th>Command &amp; Control 65%</th>
<th>Market Incentive 25%</th>
<th>Market Informing 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acts 25%</td>
<td>Acts 20%</td>
<td>Acts 41%</td>
</tr>
<tr>
<td>Regulations 8%</td>
<td>Regulations 5%</td>
<td>Regulations 8%</td>
</tr>
<tr>
<td>Rules 67%</td>
<td>Rules 76%</td>
<td>Rules 52%</td>
</tr>
</tbody>
</table>

Source: NZIER

The purpose and scope of the land transport regulatory framework is to create and maintain an open roading network, available to a wide range of users. The focus is therefore on the regulation of the users and the vehicles that can be used on the road network.

Of the 29 sets of land transport rules we have identified, 21 relate to equipment and a further four sets relate to vehicle operations.

The focus on vehicles covers both the characteristics of the vehicle as well as constraints on how it can be used, including what can be carried and on what roads.

The rules for equipment in particular rely on a combination of manufacturer standards and bespoke safety requirements.

The use of international standards in rules varies by class, age and country of manufacture of the vehicle and is overlaid with requirements for components. Many of the equipment rules relate to a specific hazard.

The combination of vehicle rules, component rules and the use of standards linked to age and origin of the vehicle make it difficult to identify which rules are affecting which part of the vehicle fleet and importantly, what if any impact they have on transport costs.
At a detailed level, we believe that the greatest complexity and therefore the largest potential for inefficiency will come from rules that impact the land transport freight markets. Our analysis of the detailed rules at mode and sub-mode level suggests that this inefficiency potential would likely be found in:

- truck mass and dimension rules particularly where they are linked to permits for road use
- rules that focus on vehicle components particularly where they refer to general safety provisions rather than manufacturers standards
- mis-matches between road freight mass and dimension rules and shipping or rail standard container loads
- passenger vehicle component rules.

Discussion with the land transport industry experts confirmed that our assessments here were a good start for further work.

6.1.3. Why is it like this?

Our analysis, and considerations at the two workshops with experts, found:

- the reliance on command and control style was linked to a number of historical and professional reasons:
  - the professional groups that dominate the regulation of land transport (engineering, planning, and legal)
  - tradition and a preference for prescribing regulations
  - a history whereby regulations were designed to limit competition
  - regulatory changes over the last 10–15 years have focused on modernising rules, but not on the regulatory structure
- land transport was seen as being inherently far more chaotic and needing of a command and control system
- the focus on regulating equipment was not surprising:
  - based on the NZ Transport Agency decision 10–15 years ago to structure land transport rules in this manner
  - rules were viewed as nimble instruments however Cabinet required the full machinery of government be used for rule changes, which has led to a plethora of rules that are too big to maintain.

6.1.4. What do we expect to see in land transport freight?

We identified land transport (LT) freight legislation as the most likely to be causing material inefficiencies in transport based on our earlier assessments:

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17 The workshop of experts included specialists in land transport policy and regulatory design as well as expert practitioners with implementing regulations.
• road freight transport is one of the highest value and one of the most interconnected of the transport sub-modes. Even small inefficiencies have significant impacts
• the rules are complex, highly prescriptive and bespoke – therefore, they are likely to impose binding constraints on operators, increasing the capital and operational cost of road freight
• the links between the objective of the rules and the rules themselves is not clearly defined making it difficult to assess whether the rules deliver the desired outcome
• the rules do not allow suggestions from operators for complying solutions and therefore, rely on the regulator to identify and respond to opportunities to update the rules
• transport productivity has not improved.

We expect to see in LT freight markets:
• heavier capital costs of compliance because the focus of the regulations is on equipment and processes
• which may increase barriers to entry, and
• higher operating costs, and
• increasing scale economies from managing compliance and its costs
• increasing scope economies across LT freight and its associated markets (integration of logistics functions).

6.1.5. What do we see in LT freight?
The S-C-P indicators suggest that overall the number of firms in the freight sector fell in the period from 2000, compared to a growth in enterprises in the wider economy (Figure 17). This was despite a larger freight task.

Figure 17 Road freight sector growth

Source: NZIER (based on Statistics New Zealand data)

Firm size has changed as well – freight firms are getting larger (Figure 18 below).
The overall decline is most noticeable in sole operator numbers (presumably owner drivers) dropping more than 20% in this period accompanied by a large growth in the number of firms with more than 100 employees. While it is clear that the sector is consolidating, the reasons for this are not readily visible. For us the potential for a regulatory causality linkage here is not certain but these changes suggest there is a need for more detailed analysis.

6.1.6. What effects do we expect to see in the LT passenger market?

The land transport passenger market is similar to freight but has a lower regulatory compliance burden and lower restrictions on entry to these markets. The passenger sector includes a variety of vehicles and sub-markets, especially at the smaller end of the market where taxis and passenger shuttles operate. These vehicles are not subject to the intensity of the equipment orientated rules that heavier vehicles and trucks are.

6.1.7. What do we see in LT passenger markets?

Entry barriers are the most often cited in economic theory as potential regulatory distortions. Of the entry requirements set by domestic regulators, licensing of land transport passenger operators appears to have the largest economic footprint. Based on our initial assessment we do not however believe these rules constitute an economically material entry barrier.

The rate of growth of enterprises numbers in the road passenger markets has been similar to the overall enterprise growth rate in the economy – hardly surprising as it is made up of passenger service firms ranging from sole trader taxi drivers through small and medium shuttle/sightseeing vehicles to buses large and small (Figure 19).
The changes to firm size that can be observed in this market are in keeping with our screening assessment of the LT passenger sub-mode. Increasing numbers of sole operators (likely taxi drivers), a hollowing out of the number of medium-sized firms and, in the same way as for the LT freight market, a significant growth in the number of larger firms (Figure 20).

We believe that this is likely to be for similar reasons as for LT freight (potentially heavy equipment focused compliance costs for all but small passenger vehicles that smaller firms cannot afford but larger firms can because of their scale economies).
6.2. Aviation

For this research, aviation is defined as those air transport modes that are regulated under the specific instruments that the regulator CAA (and Commerce Commission) enforces – primarily aviation passenger services, aviation service agents, airports, aviation freight services and the smaller sub-markets such as adventure aviation, aero clubs and aero contractor services.

6.2.1. Context

Aviation as a transport mode has a presence throughout the economy with significant share of output going to end consumption, intermediate inputs to other sector (mostly services sectors) and a large share going to export of high value lighter weight products.

Economic regulation of aviation is established at a different ‘level’ – being those of safety and security regulatory arrangements. Because international aviation routes and operating arrangements are subject to bilateral agreements between countries, the economic regulation of aviation in New Zealand was removed in step with international trends. Economic regulation of aviation was reduced from the 1980s and has adapted to international trends with technology advances in particular having a major impact on the operations and regulation of aviation services.

6.2.2. Markets

Air transport ‘operations’ dominate the wider industry which includes manufacturing, aircraft maintenance, airports and their operations and training services.

Freight services
- Air transport freight markets includes:
  - national services
  - international services.

Passenger services
- Passenger services includes:
  - national passenger services
  - international inbound and outbound passenger services.

General aviation markets
- GA Commercial – tourism, agriculture and charter
- GA Private – non-commercial owners and operators
- Pilot training.
6.2.3. Regulatory structure

Aviation (along with rail) has the lowest proportion of command and control legal instruments of the four transport modes. The regulation is focused on:

- requiring operators to suggest methods for the management of risk and achievement of standards that are considered by the regulator
- checking that air transport operators and their service providers have the required capability to meet safety standards
- ensuring compliance with international conventions.

The command and control elements seem to be linked to requiring operators to comply with international conventions.

Approximately 40 percent of the rules (by word count) address the operation of air transport services usually by aircraft class or type of service. A further 25 percent address certification of providers of services to air transport operators and a further 11 percent address the licensing of individuals.

6.2.4. Why is it like this?

The regulatory experts’ workshops considered why aviation is regulated in this way and whether we are on the right track with our assessments. Their views regarding potential inefficiencies were aligned with our views regarding areas that would be obvious candidates for detailed case studies are as follows:

- CAA use standards and certification to regulate behaviour in both commercial and safety/security aspects of the aviation transport markets
- regulatory style may seem to be command and control but is in reality market incentivising as participants are encouraged to understand the required performance standards and the risks associated with being a participant in the aviation world
- ICAO, Boeing, Airbus, Cessna and other ‘manufacturers’ set the performance standards and CAA puts a framework and standards in place to allow industry
to self-comply. They use command and control rules to implement these standards and then monitor performance against the rules

- market informing regulations are used in airports’ regulation rather than the aviation side of the sector
- they also have economic regulations to manage the international agreements and to manage international airline licensing
- they provide an ‘enabling environment’ rather than central planning and assist operators to self-manage via the advisory circular approach
- the CAA view aviation as a closed system that is easier to self-regulate via the certification system
- Technology changes are **hugely** important to aviation and industry has to be ahead of the technology wave.

6.2.5. What do we see in aviation markets?

Our screening of transport rules indicates that entry criteria for air and maritime transport are predominantly determined by international standards and rely on operators satisfying the regulator that they meet these international standards.

**Figure 22 Aviation sector growth**

The aviation sector has seen a similar consolidation to the changes that can be observed in the land transport freight sector, though the reasons for the changes in aviation are likely different (Figure 22). Aviation is regulated in a different manner to land and is heavily influenced by both international standards and ‘open skies’ competition.

Again, numbers of larger firms have been growing since 2007, but structurally aviation does not appear to be out of step with all firms (Figure 23).
There appears to have been a consolidation into larger firms.

6.3. Maritime

We describe maritime markets as those aspects of the maritime industry that are regulated by Maritime New Zealand whose focus is primarily on safety, security and the marine environment. The maritime sector is a mix of national and international freight services and local ‘working’ boats of various types. It includes private boating activity.

6.3.1. Context

The maritime sector has a widespread participation with approximately 500,000 boats in or around New Zealand; most are owned by recreational users. Regulatory arrangements in maritime were reformed in the late 1990s partly to keep pace with an expanding maritime landscape but also in response to international requirements.

Both the North Island and the South Island have a number of ports that are integrated into international shipping schedules. The ports also form part of the local shipping cabotage network used by both international vessels and a small number of local ships.

International ships are currently exempt from competition laws.

In the same way as for land transport and aviation, shipping is one component in a complex multi-modal logistics chain that is subject to both local and international regulations.
6.3.2. Markets

Maritime markets are delineated by the limits that are imposed on shipping activities by the regulator Maritime New Zealand where international shipping operates in a different environment than do ‘restricted limits’ shipping or domestic recreational boating.

**International shipping**

- International shipping markets includes:
  - freight imports and exports
  - international passenger services.

**Restricted limits shipping**

- Passenger services
- Charters
- Aquaculture
- Workboats.

**Recreational boating**

In a similar manner to private motorists, other than the direct effects of regulation on private consumption, other aspects of private boating activities are out of scope at this stage of the research.

6.3.3. Regulatory structure

Maritime legal instruments have to achieve three main objectives:

- international ships operating in New Zealand waters must comply with international conventions
- New Zealand ships are allowed to operate in overseas ports
- domestic maritime operators (commercial and recreational) operate their craft safely.\(^{18}\)

The first and second objectives are achieved by ensuring domestic instruments give effect to international maritime transport conventions and that the regulator enforces international conventions and related inspections of equipment and operating process on ships operating in New Zealand waters. The third objective is achieved by a mixture of reference to overseas experience (where available) and judgement of the appropriate level of safety.

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\(^{18}\) There are other ‘secondary’ objectives to maritime regulation such as environmental protection.
Despite a similar proportion of command and control instruments to land transport, and a focus on equipment and process, maritime legal instruments appear to be much less prescriptive than those for land transport. They are focused on the required outcomes that the equipment or processes have to be designed to deliver rather than prescribing the actual design of the item covered by the rule or regulation.

A secondary focus of the maritime transport rules is marine protection particularly with respect to avoiding and managing oil spills.

6.3.4. Why is it like this?

Two roles – enforce international conventions and set local rules

Maritime New Zealand, or Cabinet, sets rules and standards for the safe operation of ships in New Zealand waters that are compliant with international requirements (freight and passenger ships) where they exist or reflect local expectations (fishing vessels, charter boats, adventure tourism) and where international requirements are sparse or are not suited to local conditions.

The Director of Maritime New Zealand decides who to admit into the maritime ‘system’ and monitors the operation of participants in the system. They can block the operations of participants that do not meet standards.

These standards are mainly concerned with equipment design/maintenance standards, training/qualifications of the people operating the vessel and the processes and procedures for safe operations. Safety of life at sea (SOLAS) ships operate under an international regime so the role of the regulator is to enforce compliance with these rules while these ships operate in New Zealand waters.

Cargo movement, carrying of oil, marine protection and core liability regimes are all set internationally. The main sanction imposed by the Director is limitations on the ability to operate.

High-level equipment and safe operating requirements

Maritime rules prescribe basic safety features and the bare bones of what is required. Solutions to meet these requirements still need to be engineered by designers and built by operators. Freight and most passenger ship designs and
operations also have international standards that are applied in New Zealand so that the ships and personnel operating in New Zealand can also operate overseas.

There are few or no directly applicable international conventions for local maritime transport operators (fishing, charter boats and adventure tourism). For these operators the regulator considers overseas practice when setting standards but also has to consider the trade-off between setting modern safety benchmarks and the potential cost of excluding older vessels.

Main drivers for change

Over the last two years, Maritime New Zealand has focused on changes to safe ship operation (ship management and suite of seafarer qualifications) with consequential changes to ship design and construction.

The other main driver has been the incorporation of changes to international conventions on Marine Protection and Ship Safety – a six-monthly process increasingly achieved by reference to the convention.

6.3.5. Maritime market efficiency?

Local maritime transport services are small in scale but the international freight component of imports ($2.4b in 2010) and exports ($2.7b in 2010) are significant. The efficiency of the sector is therefore important from the point of view of international competitiveness and trade.

The maritime legal instruments we have reviewed seem to be focused on giving effect to international conventions and allow operators to find solutions that meet these requirements. Accordingly we expect there to be potential for changes to legal instruments that allow greater innovation or efficiency (while still complying with international conventions) to be lower than for land transport or aviation.

6.4. Rail

The rail sector has been through considerable regulatory and ownership changes over the last twenty years, with the most recent regulatory restructure in 2005 ahead of being taken back into public ownership in 2008.

Although its regulatory model has been reasonably stable since 2005, it is still going through financial and operational changes that will continue under a 10 year restructure plan which is targeting KiwiRail to become a successful standalone business.

6.4.1. Context – shape

Ownership of the New Zealand railway business has changed four times in sixteen years. There has been a history of under-investment in the network and in service quality that has left its network business with a number of ‘fitness-for-purpose’ issues. Their freight market share has declined right through this period. Rail
revenues are dominated by the freight sector though the Interislander and passenger services are also a contributors.

Their ‘turn-around’ plan to arrest and reverse the decline is founded on growing revenues in their three key markets (freight, Interislander and passenger) from a combination of market growth and providing a more competitive rail based service. These potential performance improvements are being funded by up to $1b of public investment which suggests to us it is important that the regulatory arrangements do not hinder the plan and that they too are fit-for-purpose.

6.4.2. Market – what does the rail market look like?

The rail market segregates reasonably cleanly by revenue class:

- freight
- Interislander
- passenger
- mechanical
- network usage.

Legal – what does the regulatory framework look like?

Half of rail regulation is command and control and half involves market-influencing instruments. Nearly all rail regulation is contained in legislation, with little use made of regulations and rules.

The focus is orientated towards safety systems and commercial arrangements.

Why is it like this?

The regulators advise that rail regulation has a focus on management of risks that are identified by market participants and revised by the regulator in a manner not dissimilar to aviation.

It is very much management-based regulation with a style orientated towards dialogue and audit of safety cases.
As a closed network, the focus has also been on interoperability between licensed operators using private management plans. KiwiRail is the dominant operator and acts as the monitor of the safety system, much as Airways monitors and controls the aviation safety system.

KiwiRail is undergoing a major long term restructure that is targeted at major performance improvement which will likely dominate the sector for some time.
7. Case studies

Following mode level analysis and after discussions with regulatory experts and the Ministry, we agreed to undertake various case studies to illustrate the effectiveness of our methodology and to identify potential market performance improvements for the Ministry.

Regulatory interventions in product markets can take a number of different forms and hence have a range of different impacts. Our analysis of the characteristics of the rules and the observations of regulators has not been able to confirm the effects of the regulations (i.e. do they determine or reflect operator practice).

We have not been able to find comparators of how service might be delivered differently in the absence of the regulation. A further complication is that the regulations are often focused on addressing safety issues. Our analysis in respect of this question is whether the regulation delivers the safety standard effectively and efficiently, rather than examining the trade-off between the desired level of safety and economic efficiency. Therefore, questions that would likely be ‘in-scope’ for our case study review would include whether the desired standard is clearly and objectively defined, how it is linked to internationally recognised equipment standards or national operating standards, and what are the options for compliance with the standard.

Therefore, we initially suggested a portfolio approach – a focus on road freight equipment rules and licensing of passenger land transport operators which have a large economic footprint and could be a priority as a case study. However, based on our initial assessment, we do not believe these latter rules constitute an economically material entry barrier. We did consider aviation rules, but have only focused here on two land transport rules to illustrate how our framework applies to specific cases.

7.1. Vehicle dimension and mass

7.1.1. Context

Our methodology for screening transport regulations identified truck mass and dimension rules as potentially being a priority candidate for regulatory reform because of:

- the regulatory style is command and control, and the mode is the use of detailed rules at the input level, which can get out of date, constrain innovation and place a cost burden on heavy road freight transport in New Zealand
- the influence of other potentially binding constraints on the configuration of heavy trucks outside this rule – in this case a combination of:
infrastructure requirements that limited the design options for heavier trucks that could be operated without the need for expensive infrastructure upgrades.

- willingness of road control authorities (RCAs) to allow heavy trucks to operate on parts of the network.

The vehicle dimension and mass rule and its primary legislation are currently under review. This could lead to some significant changes. But the process is at an early stage and the scope of change is yet to be determined. The discussion here is indicative only and makes no attempt to cover all the issues that will be raised by the review.

At the time of selecting this rule for a case study, we were aware that a change to the rule to allow High Productivity Motor Vehicles (HPMV) had been made in 2010 but had a low take-up rate due to the reluctance of:

- RCAs to issue permits for some routes
- operators to risk revocation of the permit and heavy fines for operating vehicles outside the conditions of the permit.\(^{(19)}\)

The low take-up rate led to a review by the New Zealand Transport Agency (NZTA) of the truck design options that could be used to better match the opportunities to increase road freight transport with the constraints of the infrastructure. At the time of suggesting the HPMV rule for a case study we were not aware of the extent and detailed of the analysis completed by NZTA in support of a rule change. NZTA prepared a detailed business case arguing for the proposed rule change along with supporting technical papers on the effect on infrastructure (bridges and road surfaces).\(^{(20)}\) The rule change was signed into law on 24 August 2014 but a date for it to come into effect has not been determined. The new rule is unlikely to come into effect until 2015 as an amendment to the Offences and Penalties Regulations is also required.\(^{(21)}\)

As the rule change has been made but not yet implemented and in view of the thoroughness of the analysis completed by NZTA on the effect of the change we have narrowed the scope of this case study to:

- comment on the assessment of benefits in the NZTA business case
- suggested next steps for the assessment of the implementation to identify opportunities for fine tuning.\(^{(22)}\)

### 7.1.2. Significance / size of the potential distortion

**[potential benefits]**

The NZTA business case estimates net road transport cost savings of $100 to $160 million per year at the end of year five based on operators achieving cost savings of 8

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\(^{(19)}\) The HPMV penalty regime was apparently much stricter than the regime applied to other vehicles as it included both much higher fines for operating outside the weight limits than for non-HPMV heavy trucks and the risk of revocation of the permit for any breach of the operating conditions.


to 12 percent on trucks that operate under the new rule and up to $15 million per year in safety gains. On balance we think that the business case is understating the potential benefits and that the implementation strategy would benefit from a more detailed analysis of the likely rate and pattern and take-up of the HPMV opportunity by operators.

**Opportunity for operators**

We agree with the following key aspects of the approach used in the business case to estimate the benefits:

- separation of the source of benefits into freight tasks that:
  - can utilise the increased volume available under the rules while remaining within non-HPMV weight limits
  - need both the increase in truck length and weight allowed under the new HPMV rule

- identification of the part of the truck fleet to which the rule applies based on both current truck weight and freight task including the assumption of no take-up by logging and specialist truck operators and limited take-up by dairy truck operators

- adjustment of the operating cost estimated provided in the Pearson report by the rate of inflation as a rough indicator of the current operating costs.

**Potential benefit under-estimation**

The business case adopts a more conservative approach in respect of the following elements of the approach used to estimate benefits:

- although the modelling of payload and other costs suggests a saving in operating costs of 15 to 17 percent the benefit modelling uses an estimated operating cost saving of 8 to 12 percent which is roughly half to three quarters of the theoretical benefit. (The business case hints that some of this leakage is due to operator caution around enforcement tolerances but does not fully reconcile the theoretical and modelled gain.)

- the benefit modelling assumes a constant freight task for the part of the fleet affected by the new HPMV rule. While this is a reasonable short term assumption, the National Freight Demand Study forecasts slow but steady growth in the road freight task which would imply both an increase in the existing task for heavy trucks and potentially also a shift in the task from heavy trucks to HPMV trucks.

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22 This would be a combination of existing trucks that are modified (by having an axle added and the chassis extended) or new trucks built to operate new rule.

23 See p15 of the NZTA business case.

24 See footnote 1 on p17 of the NZTA business case.

25 We note reference to growth of 58 percent in weight and 48 percent in weight-distance over the period 2012 to 2042. See ‘National Freight Demand Study, March 2014’ prepared for the Ministry of Transport p17.
Uncertainty about take-up pattern and ‘plateau’

The rationale for the rate and pattern of the operator take-up of the HPMV opportunity particularly with respect to the difference between the pessimistic, base and optimistic scenarios is not fully explained in the business case. In particular the business case:

- does not discuss the capacity/willingness of operators to make the switch to HPMV trucks and does not comment on how long the modifications take for existing trucks or the availability of new trucks
- assumes a linear rate of substitution of about 9 percent of the fleet (for five years) based on the average age of the fleet:
  - the business case links the permit-take-up rate to the average age of the fleet adjusted for freight tasks for which are unlikely to use HPMV trucks but the comment on the fleet age and purchase of new trucks seems to suggest a potentially faster-take-up rate than is actually modelled
  - also the termination of the business case analysis at 5 years does not answer the question of the likely end-stage proportion of HPMV trucks in the part of the fleet considered by the business case.

Penalty regime tolerances

The NZTA business case does not comment on the effect of the penalty regime on the permit take-up rate. While the new HPMV rule has a more lenient penalty regime than the 2010 HPMV rule the tolerances for overloading are low compared to the rules for non-HPMV trucks.

7.1.3. Things we don’t know

The NZTA business case has considered all of the information on the benefits and costs of the new HPMV rule that we have been able to identify. We have argued that the business case appears to underestimate the potential benefits primarily through scaling back the estimated operational benefits, limiting the analysis period to 5 years and discounting the growth in the freight task. However, as the rule has been approved, it would be more productive to include these considerations in the planning of the implementation and benefit realisation phase of this rule change and consultation with operators rather than rely on more desktop analysis.

7.1.4. Recommendations / next steps

We suggest that the Ministry consider consulting in due course with operators to test and likely extend the NZTA benefit estimates (including permit take-up assumptions) as part of the planning for the implementation of the new HPMV rule.
7.2. Heavy Vehicles

7.2.1. Context

Our methodology for screening transport regulations identified truck mass and dimension rules as potentially being a priority candidate for regulatory reform because of the:

- component-by-component based structure of the rules
- variation in how acceptable standards are set and who is trusted to interpret the standard for different components
- apparent lack of direct connection between the method used to regulate a component and either the improved reliability of the component or the contribution of greater reliability of that component to improved safety overall.

These rules exhibit the following characteristics that raise the risk of product market inefficiency:

- the regulatory style is command and control, and the mode is the use of detailed rules at the input level, which can get out of date, constrain innovation and place a cost burden on heavy road freight transport in New Zealand
- road transport accounts for $6.8b of land transport activity – equivalent to 1.4% of New Zealand GDP.

7.2.2. The Rule

The objective of the Land Transport Rule: Heavy Vehicles 2004 is to reduce the incidence of heavy-vehicle crashes associated with such defects as the failure of load anchorage points, draw-beams and drawbars, log bolster attachments, chassis modification, electrical systems and wiring, equipment locking devices. The rule also includes requirements aimed at reducing the risk to safety resulting from draw-beams and drawbars remaining too long in service. Other rules address safety aspects for heavy vehicles such as dimensions and mass, tyres and wheels and brakes.

The rule includes a mix of approaches to specifying the safety requirements for heavy truck components and requirements for certification as follows:

- high level safety requirements which effectively state that the equipment has to be adequate for all conditions for which it was constructed and has to be maintained within a safe tolerance. This type of requirement applies to:
  - ‘Section 3 General Safety Requirements’
  - ‘Section 4.1 Vehicle and component requirements’ and ‘Section 4.2 Tractors and agricultural trailers’

26 These two sections are part of ‘Section 4 Towing connections’. The wording of Section 4.1 suggests that tractors and agricultural trailers could be covered by either the general requirements in Section 4.2 or the detailed standards in Sections 4.3 to 4.8.
‘Sections 5.1 Load securing equipment’, 27 ‘Section 5.2 Containment by a vehicle body’, ‘Section 5.4 Curtain-sided bodies’ and ‘Section 5.6 Headboards, sideboards and tailboards’

‘Section 6.2 Modification affecting engine and transmission’

A summary of these rules and the components they apply to is listed in Table 12.

- Compliance with independent standards for components including in some case certification of design, construction and the estimated life of components. This type of requirement applies to:
  - most of ‘Section 4 Towing connection’ 28 requirements which aside from (agricultural trailers) are required to comply with:
    - various New Zealand and Australian standards depending on the type of towing connection and in some cases when it was installed
    - ‘New Zealand Truck-Trailer Manufacturers’ Federation Recommended Practice’ 29 which seems to include a requirement for certification by a mechanical engineer of the design of the towing connection
  - ‘Section 5.3 Stockcrates and stockcrate retention devices’ and ‘Section 5.5 Load anchorage points’

- Compliance with manufacturers standards and certification by a vehicle inspector for modifications after 1 April 2005 30 applies to the following:
  - ‘Section 6.1 General requirements for modification’
  - ‘Section 6.3 Modification affecting axles, suspension and steering’
  - ‘Section 6.4 Modification affecting chassis’
  - ‘Section 6.5 Conversion of a vehicle to right-hand drive’
  - ‘Section 6.6 Conversion of a vehicle to dual steering’

- Compliance with design standards defined for components defined in the rules, and compliance with New Zealand welding standards requiring engineer certification of design, construction and the estimated life of components. This requirement applies only to the attachments of ‘bolsters’ to logging trucks, is described in the Schedule 1 Bolster Attachment Code. The application of these approaches to the various components covered by the rule is shown in Table 12.

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27 Section 5 relates to the structural requirements for trailers.  
28 Towing connections include drawbeams, towbars, drawbars, couplings, fifth wheel assemblies, skid plates and kingpins.  
29 We understand that some of the elements of this code of practice have been absorbed into or superseded by the New Zealand and Australian standards referred to in Section 4 Towing Connections.  
30 It was not clear from this rule, what provisions applied to modifications before 1 April 2005.
Table 12 Components subject to general safety requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>General safety requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis and body strength</td>
<td>Adequate for all conditions of loading and operation for which the vehicle was constructed</td>
</tr>
<tr>
<td>Vehicle body and equipment attachment</td>
<td>Stress cannot exceed 60% of yield stress from:</td>
</tr>
<tr>
<td></td>
<td>• longitudinal or downward force, twice the payload capacity plus body mass</td>
</tr>
<tr>
<td></td>
<td>• transverse or upward force equal to the payload capacity plus body mass</td>
</tr>
<tr>
<td></td>
<td>(Note: Bolster attachments and towing connections need to meet additional requirements)</td>
</tr>
<tr>
<td>Cab-guards (logging trucks)</td>
<td>Able to withstand braking force of 1g, and prevent any part of the load entering cab (by being as wide and high as the cab and not having any holes large enough for part for the load to fit through)</td>
</tr>
<tr>
<td>Transmission</td>
<td>As for chassis/body strength plus:</td>
</tr>
<tr>
<td></td>
<td>• installed correctly, as per manufacturer’s instructions, maintained within safe tolerance of original condition</td>
</tr>
<tr>
<td></td>
<td>• driveshaft failure device must be maintained within safe tolerance of original condition</td>
</tr>
<tr>
<td></td>
<td>(This also applies for modifications to the transmission Section 6.2)</td>
</tr>
<tr>
<td>Axles</td>
<td>As for chassis body strength plus no fitting of device to alter mass distribution between axles except for unpowered axles subject to special conditions</td>
</tr>
<tr>
<td>Suspension</td>
<td>As for chassis/body strength plus maintain axle stop device within safe tolerance of original condition</td>
</tr>
<tr>
<td>Ballrace turntables</td>
<td>Securely fastened and maintained within safe tolerance of original condition</td>
</tr>
<tr>
<td>Electrical requirements,</td>
<td>As for chassis body strength plus equipment needs to be protected from damage</td>
</tr>
<tr>
<td>Equipment locking devices</td>
<td>A sliding axle set or sliding chassis, or an outrigger, must have an effective locking device so that other road users are not endangered by inadvertent extension or separation of that equipment</td>
</tr>
</tbody>
</table>

Source: NZIER analysis of Land Transport Rule: Heavy Vehicles 2004 Rule 31002

7.2.3. Significance / size of the potential distortion  
[potential benefits]

This rule is part of a set of 4 main rules that define the safety standards that heavy truck equipment components are supposed to meet to ensure that heavy trucks meet the required safety standards. The component focus of the land transport rules along with the setting of standards based on a mix of manufacturer standards, country standards and bespoke design standards and compliance with and without certification creates the potential for significant variation in how safety risks are identified and mitigated. These variations can cause inefficiencies in the way regulation is used to address safety issues if:

- there is no overarching approach to assessing the contribution of component reliability to either the overall reliability of the vehicle or the reduction of harm caused by a vehicle failure

there is a tendency for the rules to evolve adaptively in response to local accident experience. This land transport rule has indications of both of these elements. The emphasis on a component focus does not suggest a top-down analysis of the contribution of vehicle reliability to improved safety or an explicit consideration of how to address the diverse safety issues posed by a mixed and ageing fleet. Also, the rules for towing connections and bolsters do appear to have been driven by investigation of accidents in the late 1980s and 1990s.

We have not been able to quantify significant individual distortions arising from this rule; however, the following observations on apparent variations in the approaches within the rules suggest areas that may be causing avoidable inefficiency (either unnecessary compliance costs or an ineffective contribution to improved safety):

- the most detailed design requirements and most thorough certification requirements in the rules apply to bolsters on forestry logging trucks. The rules:\(^{32}\)
  - specify the design requirements of the bolster including load calculation formulae and expected time in service for both the bolster and shorter life components
  - require certification of the design, construction, installation and repair of the bolster by qualified registered ‘experts’, specifies both the expected life of the certificate (3 to 10 years\(^ {33}\)) and the form of the certificate that should be used

- rules for towing connections:
  - supposedly have the intention of ensuring that equipment is not kept too long in service but the rule does not appear to specify a maximum life (in either time or distance travelled) in the same way as is required for bolsters on logging trucks
  - were apparently based on a different definition\(^ {34}\) of loading from that is used in overseas standards to allow mixing and matching of trucks and trailers which has an ambiguous effect on the cost of ensuring imported vehicles comply with local requirements.

7.2.4. Scope for change/cost of change

We believe that there is moderate potential to both lower the cost and improve the effectiveness of this rule by:

\(^{32}\) We also note that these rules do not seem to be clearly linked to the rules on static roll threshold (which seems to be a likely area of synergy for the safe operation of logging trucks), and also include two versions of the bolster attachment code agreed with the Log Transport Safety Council of New Zealand.

\(^{33}\) The rationale for the choice of a design life in years is unclear. It would make most sense if time dependent processes such as corrosion were the main driver of failure, but it does not seem to be a particularly good proxy for number or weight of loads carried.

\(^{34}\) See Appendix III Notes on the design loads used in the Code (Section 6.1.2) p5, which states "Many overseas Codes are written in terms of the “D” value … it was considered that the Code would be easier to administer if loadings were expressed in terms of the trailer weight rather than the D value. … The D value has been retained because overseas components are often rated in this manner."
• adopting a more consistent approach to the setting of standards and certification requirements for compliance for the reliability of truck components
• completing a top-down analysis of the contribution of component failure to frequency and harm caused in truck accidents by component failure.

Realisation of these benefits will be gradual as it depends on a change in the focus and structure of the rules, retirement of the legacy effect of the existing rules and the rate of replacement of trucks.

7.2.5. Things we don’t know

We do not have a clear understanding of the following:

• the actual cost of the design and certification requirements described in the previous section and the estimated safety benefit provided separately by the design standards and the certification requirements
• the effectiveness of the certification requirements in ensuring the timely replacement of fatigued or worn bolsters and towing connections compared to the inspection approach used for other components
• how the effectiveness of the existing rules in delivering an expected level of safety is measured or assessed both by the regulators and stakeholders
• whether it is becoming more or less difficult for the regulator to maintain the relevance and coverage of the rules given the age of the New Zealand fleet, change in the freight task and technological change in the design of trucks and other vehicles.

7.2.6. Recommendations/next steps

We suggest that the Ministry should commit resources to further investigate the potential for rationalisation and consolidation of truck component rules that:

• applies a top-down/safety case approach to truck reliability
• standardise the requirements for compliance certification and inspection of vehicle components by vehicle type and use.
8. Review

Our views on the overall shape of transport regulation come from being able to look at the sector from the outside and from the top down as opposed to being deep inside the working parts.

We are satisfied that the regulatory review methodology we proposed to the Ministry works and works very well.

Outputs from this research

The RfP for this research called for four specific outputs which are summarised in Table 13 with reference to the section of this report that responds to the requirement.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Reference report sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High level framework to identify a short list of areas for exploration</td>
<td>Framework is in Section 2 with detailed analysis is in Sections 3 and 4</td>
</tr>
<tr>
<td>2. Short list of areas for exploration</td>
<td>Analysis and summary are in Section 5</td>
</tr>
<tr>
<td>3. Process to assess market effect of regulation</td>
<td>The overall approach was designed to deliver a methodology to achieve this outcome</td>
</tr>
<tr>
<td>4. Review of 4 – 5 specific areas of legislation for market effects</td>
<td>Review and evidence are in Section 7</td>
</tr>
</tbody>
</table>

Source: NZIER

Compare and contrast – common themes

Transport regulation in New Zealand is absent a common ‘regulatory regime’ with each mode following a different regulatory strategy despite having what appears to be common drivers – international standards for safety and security, technology, as well as a focus on efficient transport operations.

There is no longer much pure economic regulation of transport in New Zealand. The internationalisation of transport standards, in particular, now places considerable constraint on New Zealand’s ability to go it alone in aviation and maritime areas of transport regulation.

The other driver for change that we see is the rapid, discontinuous change that some modes experience. They grapple with how to be adaptive and efficiently cope with changes but at the same time provide a high degree of certainty to users of transport services. The incremental approach that is taken to improvements to transport regulation compounds this situation.

Next steps – investigate focus areas, broaden the review

This research has made reasonably detailed assessments of the constraints that regulations impose on transport product markets. It is a top-down assessment with a
scope that ‘started at 30,000ft and descended to 5000ft’. We believe that the results should be used as a starting point for more detailed empirical work in product markets. Our review of product market performance indicators illustrates the potential for efficiency impacts in particular transport product markets and is a starting point for the next stages of work.

From our analysis we believe that the review should be broadened out to consider wider market impacts – there will be both direct and indirect impacts on transport markets from regulation and the potential gains that this research has identified are likely to be the ‘low water’ mark of performance improvements.

Figure 27 below is helpful to understand the narrow nature of this research and where it fits in the wider sector. It usefully points to the wider market factors that need to be considered when undertaking the type of analysis that we propose here.

Figure 26 Broaden the review

Where this research fits

Regulatory constraints…
- What vehicle can be used where and how?
- Capital vs operating cost

Market pressures
- Meet demand and make a profit
- Compete or partner?

Operator decisions…
- What are the binding constraints?
  - Regulation or market pressure
- How can I make the most out of what I have?
  - Adjustable versus fixed
  - Cost of change
- Who do I need to satisfy?
  - Regulator
  - Other transport partners
  - End customer

Rules
- Vehicle mass/dimension
- Component requirements

Roading authority
- Route/destination
- Load size and type

Fees and charges
- Road user charges
- Compliance cost
- Tax

Capital

Sweat asset

Innovate

Transport demand
- Load size and type
- Distance and time
- End to end or part of a chain

Operator legacy
- Investment in fleet
- Process/network
- Customers and partners

Analysis at firm level

Future stages of this work will likely require greater disaggregation of the type of analysis we undertook at product market level and in the case studies, to identify the detailed evidence of inefficient outcomes from regulation at the regional and firm level. Evidence at the market level suggests that there is the potential for gain; however the potential needs to be confirmed at a detailed level and the causality proven.

Source: NZIER
What would we look for at firm level?

Indicators of inefficiency at the micro level (firm level or specific regulatory intervention level) will be different than our S-C-P market indicators and we would use a different organising device – that is, we would focus on the regulatory target. Here we would look for the following indicators:

- prescriptive regulations regarding technology, inputs, processes
- long-lived prescriptive rules
- the use of local rather than international transportation standards
- high levels of administrative effort by firms to comply with regulation
- high compliance costs that require real resources and frequent regulatory activity
- entry and exit controls
- a regulatory framework that lacks integration and has incompatible elements
- the absence of (or limited) horizontal integration of regulatory regimes across a sector.

This stage would involve more desktop research but there would also be a substantial requirement for sector level survey work as well as consultation with regulators and especially with the transport operators who live with regulation in the real world.
Appendix A References


http://books.google.co.nz/books?hl=en&lr=&id=8DfXlgIaqUC&oi=fnd&pg=PP2&dq=understanding+regulation+baldwin+cave&ots=--2IS5DNur&sig=v0JxZaOLTzQeNn9uvsgaqxC0T_w.


Ministry of Transport. []. ‘Regulatory Impact Statement Civil Aviation Rules — Security Rules Update (docket 7/CAR/1)’.


Appendix B Terms of reference

Overview

The government’s objective is to create a regulatory environment, which is effective but minimises unnecessary costs; the government should only intervene when the benefits of intervention outweigh the anticipated costs. Effectiveness and efficiency are two key tests.

While there has been a lot of focus on reducing administrative costs, the purpose of this project is to seek to reduce costs created where transport regulation unnecessarily prevents or reduces the effective operation of markets.

The brief does not set out a detailed problem definition or preferred combination of analytical framework, primary research, data analysis etc. that the successful supplier should adopt. However, the scope of services indicates the Ministry’s core questions and the rationale for these (i.e. the sorts of decisions or policy adjustments that might be informed by this work).

We invite prospective suppliers to consider the issues raised in this RFP and in their response set out the methodological approach they would take.

Evaluation and ranking of proposals will be influenced, amongst other considerations, by:

- the degree to which the proposals articulate the issues that need to be addressed
- the accessibility of outputs provided
- the practicability of methods proposed for mitigating and managing cost pressures.

Background

The Government’s 2009 statement ‘Better Regulation, Less Regulation’ makes commitments to:

- introduce new regulation only when the government is satisfied that it is required, reasonable, and robust
- review existing regulation in order to identify and remove requirements that are unnecessary, ineffective or excessively costly.

An example of where our review efforts should be focused is in identifying where regulations or the application of regulations, instead of reducing market inefficiencies may be exacerbating them. This might be by preventing the effective flow of information; creating barriers to entry; or otherwise providing certain firms with additional market power; for example by inadvertently creating regional or national monopolies.
Objectives

This project should look across the whole of the transport regulatory system for opportunities to improve the regulatory environment. This includes all modes of transport and also all levels of the regulatory system. A list is attached at Appendix A of the major acts and major statutory regulations for the sector.

We invite prospective suppliers in their response to set out the methodological approach they would take, keeping in mind the deliverables set out at paragraph 2.3.5 below. The challenge will be to first apply a high level filter to identify where the opportunities for change are most likely to be found, then to undertake in smaller focused areas more detailed analysis to explore the effects of the operation of the regulation in the market.

We are seeking analysis that complements the Ministry’s own initiatives, by contributing:

- an independent perspective
- a strong economic underpinning i.e. with respect to the economic efficiency effects of regulation
- familiarity with the current central agency guidance about regulatory performance in New Zealand but awareness of the conceptual and practical challenges

We are not seeking:

- duplication of existing government work on regulatory performance or the Ministry's own programme
- a detailed stocktake of existing transport regulation.

Project governance/management

The Ministry will appoint a project leader to act as the point of contact for all project content.

Deliverables

The key deliverables of the research include:

- *A high-level framework to identify a short list of areas for exploration.* Application of this framework in the future should allow the Ministry to identify further potential areas of focus for the Ministry’s future work programme. The framework needs to be able to look beyond primary and secondary regulation and examine how regulation is applied in a given sector. For example, it should examine and be able to identify:
  - Where regulations or the application of regulations, instead of reducing market inefficiencies, may be exacerbating them (for example, by preventing the effective flow of information; creating barriers to entry; or otherwise providing certain firms with additional market power (inadvertently creating regional or national monopolies).
- A short list of areas for exploration
- A process to assess the market effect of regulation
- A review of 4-5 specific areas of legislation with analysis of the effects of that legislation on the markets.

Respondents should also include review points in their project proposal to provide opportunities for the Ministry project contact and other staff to review progress against objectives and to provide independent advice and inputs to the process progressively.
## Appendix C NZSIOC

<table>
<thead>
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<td>Road freight transport</td>
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<tr>
<td>II111</td>
<td>Road transport</td>
<td>I462100</td>
<td>Interurban and rural bus transport</td>
</tr>
<tr>
<td>II111</td>
<td>Road transport</td>
<td>I462200</td>
<td>Urban bus transport (inc tramway)</td>
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<td>Taxi and other road transport</td>
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Appendix D – Economic linkage charts

Figure 27 Inputs to the transport sector by mode (backward linkages)
2011; $m; Intermediate consumption

Source: Statistics New Zealand, NZIER
Figure 28 Use of transport by other industries by mode (forward linkages)

Source: Statistics New Zealand, NZIER

Note that this is the amount of transport services that each sector consumes, not the size of each sector.
How important are these forward linkages – size and growth rates matter

In Figure 30 below, we introduce the importance of each sector (shown in terms of its contribution to GDP) alongside the transport forward linkages. Larger bars on the LHS are important because they show high consumption of transport services by large industrial sectors. Standouts here are that transport is an essential input to the Food and Beverage manufacturing and the Wholesale/Retail trade sectors which together account for nearly 15% of GDP. The dominance of blue bars here shows a heavy dependence on road transport.

Figure 29 Size – transport linkages and sector GDP
2011; (LHS) Use of transport in $m, ranked in descending order of contribution to total GDP; (RHS) Contribution to total GDP in %

Source: Statistics New Zealand, NZIER
Figure 31 below, which describes sector growth over the 2000 to 2010 period, shows that transport markets have strong linkages with (large) mostly low to medium growth industries. Again, larger bars on the LHS are important and, while they are only modest consumers of transport services, **Professional, Scientific and Technical Services** and **Construction** are strong growth sectors. This data does however mask that **Dairy Product Manufacturing** (a sub-industry of Food, Beverage Manufacturing) has shown a strong 6% pa growth over this period and is a large consumer of multi-modal transport services.

**Figure 30 Growth – transport linkages and sector growth**
2011; (LHS) Use of transport in $m, ranked in descending order of value added growth; (RHS) Nominal annual value added growth %

Source: Statistics New Zealand, NZIER
Appendix E Regulatory trends

Figure 32 shows the trend towards more involvement of government in network industries (this includes all transport modes) in New Zealand compared to an overall decline across OECD members. The OECD measure government involvement using an index where 0 is no involvement and 5 is heavy involvement.

Figure 31 Network industry regulation

Source: OECD, NZIER

This trend towards increasing regulatory involvement in transport product markets is accompanied by an overall increase in the use of command and control instruments (Figure 33) in contrast to the OECD trend.

Figure 32 Use of command and control regulation

Source: OECD, NZIER
We have also seen an increase in direct government control of firms since 1998, although that trend may have reversed since 2008 (Figure 34).

**Figure 33 Government control of firm activities**

![Graph showing government control of firm activities from 1998 to 2013.](chart)

Source: OECD, NZIER

We commented on this chart earlier in the report but again, productivity at the macro level in the transport sector is consistent with what the OECD macro evidence argues would be expected – that is, de-regulation through 1978 to 1998 produced marked gains in productivity that were not sustained. Figure 35 below identifies productivity declines that coincide with the trend to more government involvement in this market that we have identified here. We note that other factors can also influence productivity.

**Figure 34 Long term productivity trend**

![Graph showing long term productivity trend from 1978 to 2011.](chart)

Source: Statistics New Zealand, NZIER