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Consultation Regulation Impact Statement: HVRR Phase 2: Independent price regulation of heavy vehicle charges

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Acronyms and abbreviations

ACCC	Australian Competition and Consumer Commission
BBM	building-block model
CBA	cost–benefit analysis
COAG	Council of Australian Governments
DAE	Deloitte Access Economics
FLCB	forward-looking cost base
FTE	full-time equivalent
HVIR	Heavy Vehicle Infrastructure Rating
HVRR	Heavy Vehicle Road Reform
IPR	independent price regulator
NTC	National Transport Commission
PAYGO	pay as you go
RIS	Regulation Impact Statement
RUC	road user charge
TIC	Transport and Infrastructure Council

Executive summary

Background

The Australian Government and state, territory and local governments fund the construction and maintenance Australia's government-managed roads.

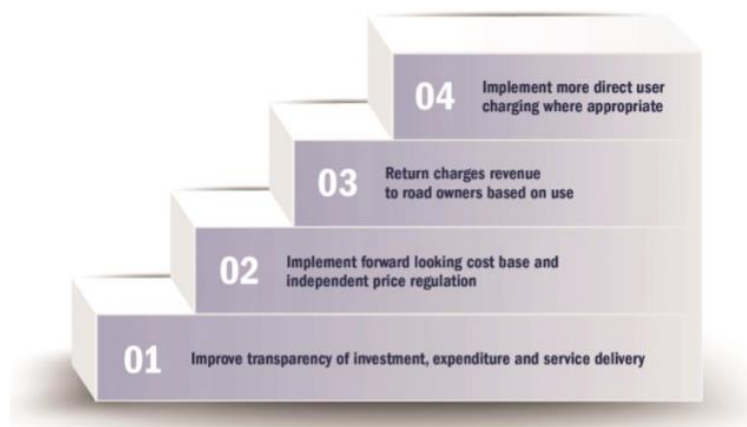
While heavy vehicles make up a small percentage (approximately 3%) of vehicles on the roads, they are responsible for a significant proportion of road construction and maintenance costs.

Broader Heavy Vehicle Road Reform program

In 2006, the Productivity Commission found that 'current pricing and regulatory arrangements are hampering the efficient provision and productive use of road and rail infrastructure' and recommended that governments pursue a reform program to improve efficiency and productivity within the road sector (PC 2006).

To address problems with the current heavy vehicle charging and investment arrangements, the Transport and Infrastructure Council agreed in May 2015 to progress Heavy Vehicle Road Reform (HVRR) and agreed on a reform road map (Figure ES1) that set out a four-phase reform program. The road map outlines reform steps along the path to full market reform of heavy vehicle investment and charging arrangements. The road map builds on joint work undertaken by governments on heavy vehicle road reform between 2007 and 2014.

Figure ES1: Overview of the heavy vehicle reform road map



Under HVRR, the proposed 'end state' would result in an independent regulator providing full economic regulation, giving oversight of pricing and road investments. This would turn the provision of heavy vehicle road infrastructure into an economic service, where feasible, and the framework would be similar to those currently used in other sectors, such as water, energy and telecommunications. In addition, the end-state reforms would be expected to result in the following outcomes:

- Investment coordination and planning are improved.
- Road services are delivered to defined standards according to agreed investment plans.

- Heavy vehicle road users pay charges that more directly reflect the costs they impose on the road network.
- A more direct link is established between heavy vehicle charging revenue and funds available for road investments.

The overall aim is to deliver the roads needed for strong freight productivity growth in a transparent, equitable and affordable manner – to have the right truck on the right road at the right price.

Reforms under consideration in this RIS

This Regulation Impact Statement (RIS) relates to reforms under Phase 2 of the broader HVRR program. The objective of the reforms considered in this RIS is to implement key steps towards the end state by reforming governance and charging arrangements. The core elements of this phase of reforms relate to:

- the establishment of an independent price regulator (IPR), which would have powers to set prices independently of government and potentially perform a range of oversight activities related to forward-looking road expenditure; and
- the implementation of a forward-looking cost base (FLCB), which would develop a building-block model to determine allowed revenue under heavy vehicle charging based on expected future expenditure.

In developing the analysis, two alternative reform options of independent price regulation and the use of an FLCB were identified:

- **Reform option A** implements a simple level of independent price regulation, while
- **Reform option B** is a more progressive step with slightly more ambitious implementation settings, including the ability for the IPR to undertake additional scrutiny of road manager expenditure proposals; a commitment from road managers to a customer service charter on key freight routes; a more formal mechanism for user input into pricing determinations (for example, an expert panel); and the ability for the IPR to alter the mix of registration charges and road user charges¹.

The reform options are described in detail in Section 3, and the likely timings for implementing either reform would be to agree on policy settings for the IPR in 2019 and to establish the IPR in 2020. In addition, the detailed policy settings for the FLCB would be set in 2019, and the first FLCB would be developed in 2020.

In addition to the two reform options, the option of rejecting the reforms and retaining the base case is also considered.

Analysis of the options

Marsden Jacob Associates undertook a preliminary impact analysis of the proposed reforms to identify and quantify the additional or incremental costs and benefits of each of the reform

¹ The NTC currently has the ability to recommend changes to the mix of registration and road user charges. However, changes to the mix are typically constrained as it impacts the respective revenues of federal and state governments. Under the reform being proposed, the mix is able to change with the assumption that any change in the registration portion of the charging mix would see state and territory governments receive a corresponding allocation of fuel excise receipts to maintain each state's total share of current revenue received.

options relative to the base case. The impact analysis included multiple forms of analysis, such as:

- cost–benefit analysis;
- regulatory burden measurement;
- risk analysis; and
- analysis of competition and other impacts.

While the RIS focuses on the current reforms, it is useful to assess these reforms under both a scenario in which no further reform is undertaken (even though this is considered unlikely to be relevant) and a scenario in which further reforms under HVRR are undertaken.

On this basis, the benefits and costs are estimated under two scenarios:

- **Scenario 1: No further reform undertaken; and**
- **Scenario 2: Further reform undertaken.**

Cost–benefit analysis results

Under **Scenario 1**, developing an accurate estimate of the value of benefits that would arise under each option of the current reforms is not possible at this stage. In particular, while it is possible to define and value the potential end-state benefits associated with a more comprehensive heavy vehicle reform agenda, it is much more challenging to define the contribution of Reform option A or B to those end-state benefits.

This is because of the nature of the reform (i.e. it is a reform involving a new regulatory framework) and that it is very challenging to estimate the extent that road managers will be incentivised to improve the efficiency of their investments in response to the type of reforms under Reform options A and B.

Moreover, previous estimations of the benefits of heavy vehicle reform assumed the full end-state. However, Reform options A and B are a transitional step toward the full end-state and it is challenging to estimate their contribution to end-state benefits as some key reform components, which are integral to quantifying the end state, are not part of Reform options A or B, including:

- a more comprehensive form of economic regulation that includes the ability for the IPR to disallow expenditure that it does not regard as efficient or prudent; and
- reforms that involve revenue from roads being returned to road owners.

As a result, the RIS applies a threshold test that examines whether it is likely that the benefits will be greater than the incremental costs, taking into consideration the type of benefits identified in the RIS and how they may contribute, even partially, to the end-state benefits.

The incremental costs of the reforms are estimated to be in the order of \$9 million for Reform option A and \$92 million for Reform option B in present value terms and using a 7% real discount rate over a 20-year period. Therefore, for the net benefits to be greater than zero (that is, to have a present value that is positive and a benefit–cost ratio greater than or equal to 1), the gross incremental benefits need to be higher than \$9 million for Reform option A and \$92 million for Reform option B.

Whilst further research would be required to precisely estimate the benefits of implementing an IPR in isolation, recent work undertaken by Deloitte Access Economics (DAE 2017), estimated the end-state benefits (with some adjustments) to be around \$5.8 billion. We refer to this in the

RIS as the ‘revised end-state benefit’. The net benefits are greater than zero if the reforms deliver a contribution to the relevant end-state benefits of:

- 0.16% for Reform option A; and
- 1.3% for Reform option B.

Scenario 2 assumes that further reform is undertaken and considers the benefit or cost that would arise if the current reforms were to bring forward or delay reaching full reform. The net benefits of Reform options A and B under Scenario 2 are also examined with reference to a threshold analysis because of uncertainty about the exact length of time that the end-state reform might be delayed if Reform option A or B is not undertaken.

Using this approach, the net benefits are estimated to be greater than zero for Reform options A and B if undertaking the reform avoids a delay in achieving the end-state reform of 6 and 62 days respectively.

Evaluation of the options

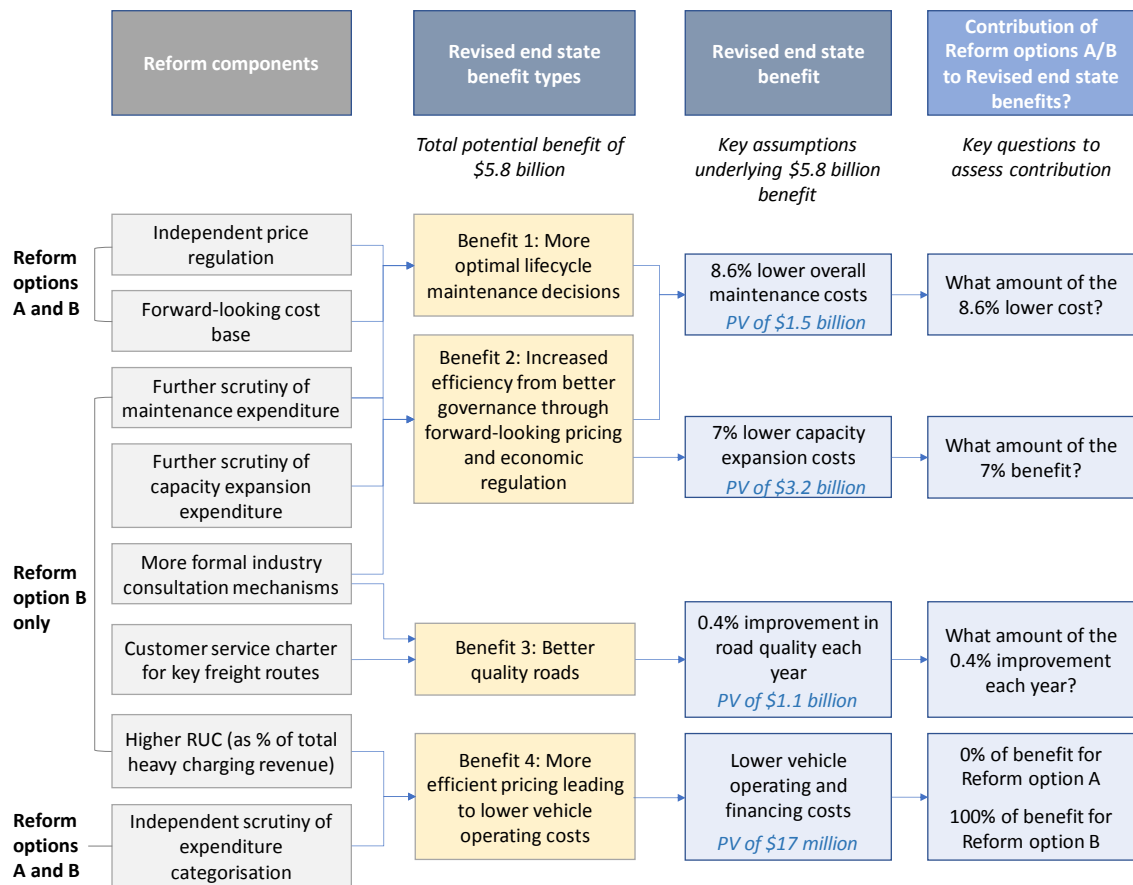
Under **Scenario 1**, Reform options A and B both have the potential to go some way towards achieving the end-state reform for heavy vehicle charging and investment, noting that Reform option B implements a model that is closer to the end-state reform than does Reform option A.

However, the key threshold question is ‘What proportion of the revised end-state benefits are likely to be achieved under Reform options A and B?’

The RIS describes a number of benefits that are likely to arise from Reform options A and B and how they are linked to end-state benefits. In doing this, the RIS illustrates the key questions to ask when assessing the potential contribution of Reform options A or B to the revised end-state benefit, which is estimated to be \$5.8 billion. Figure ES2 shows that there are three key questions that will determine the size of the benefits:

- What impact will Reform option A or B have on road maintenance costs?
- What impact will Reform option A or B have on road capacity expansion costs?
- What impact will Reform option A or B have on road quality and levels of service?

Figure ES2: Contribution of Reform options A and B to end-state benefits



Note: The % changes in the diagram for maintenance, capacity expansion and road quality are estimated from a Deloitte Access Economics Report (2017) which estimate the benefits of the full end-state.

To assist in answering these questions, Table ES1 examines key factors that may either enable benefits to be realised or limit benefits. These factors assist in determining the size of the contribution; for example, how much Reform option A or B will contribute to lower maintenance costs.

Table ES1: Factors to consider when assessing the size of benefits

Benefit type	Enabling factors	Limiting factors
Benefit 1: More optimal lifecycle maintenance decisions	- A forward-looking cost base (FLCB) encourages greater focus on customer needs and efficient investment over the longer term, while encouraging improvements to asset management systems. - Additional scrutiny of maintenance expenditure may encourage lower maintenance costs (see benefit 2).	- An FLCB that involves only a one- or two-year forecast may not result in much change, as state governments already largely plan at this level. - Without reforms to road funding, it is challenging to implement a more optimal lifecycle maintenance plan.

Benefit type	Enabling factors	Limiting factors
Benefit 2: Increased efficiency from better governance through forward-looking pricing and independent price and/or economic regulation	- By publicly highlighting areas where road managers may be able to reduce costs or improve the efficiency of their investments, the IPR has the potential to place a level of public scrutiny on expenditure proposals (and past expenditure) that does not currently exist. - Scrutiny will be assisted by comparative benchmarking of expenditure across states and territories, which will be supported by new data and analytical systems. - Existing scrutiny of maintenance expenditure is constrained by a lack of robust benchmarking information. - A more formal industry consultation process has the potential to alter investment priorities and service levels.	- The benefits of IPR scrutiny of expenditure may be limited because the following existing processes already provide a level of scrutiny: - existing internal state government budget processes; - Infrastructure Australia evaluation processes for expenditure submissions; and - BITRE benchmarking on road construction costs and key cost drivers (BITRE 2018). - Some governments have existing freight industry consultation forums, which partly provide existing formal user input mechanisms.
Benefit 3: Better quality roads, leading to lower vehicle operating costs	A customer service charter may result in some roads receiving a higher level of service than they would have otherwise receive.	- The customer service charter applies only to key freight routes, although those routes make up a significant proportion of arterial roads. - Without reforms to road funding, committed service levels may be set conservatively.
Benefit 4: More efficient pricing, leading to lower vehicle operating costs	A road user charge (RUC) that is set at a higher level to reflect more efficient pricing will not exceed the current fuel excise level.	It is unclear whether there are any limitations.

Scenario 2 provides a more definitive result, in that the benefits are likely to be greater than costs under both reform options. This is because if Reform options A and B are rejected there is likely to be a delay in moving towards end-state reform, and it does not need to be a very long delay for the benefits to be greater than the costs. A delay of only 2 months is likely to be more than sufficient to justify moving ahead with either reform option.

However, it is important to note that Scenario 2 assumes further reform towards the end-state reform.

Recommendation

Based on the preliminary evaluation of the options under Scenario 1, Reform options A and B should be recommended if it is considered likely that benefits flowing from the reform option outweighs the costs. As the reform costs have been estimated, a threshold analysis has been used to identify the point at which benefits would be greater than the costs.

This threshold has been identified as being met if Option A delivers more than 0.16% of the estimated end-state benefits and if Option B delivers more than 1.3% of the estimated end-state benefits.

While these thresholds appear low, we would welcome input from stakeholders on whether they consider that the benefits are likely to be sufficient to outweigh the costs, taking into account the nature of the benefits described in the RIS (as summarised in Figure ES1 and examined in more detail in the body of this RIS).

It is also noted that under Scenario 2 (further reform), a delay of 1 year in implementing full reform is valued at \$546 million per year (see Table 22). **As a rejection of both reform options would be likely to stall further HVRR for an extended period (possibly 3–6 years or more), a decision to reject both reforms would result in an opportunity cost of around \$2–3 billion.**

Submissions on this consultation

Marsden Jacob is seeking stakeholder views and responses on the advantages and disadvantages of the proposed heavy vehicle funding reforms. In providing a response, you are invited to either:

- answer ‘guide questions’, which are provided in Appendix 3 of this RIS; or
- provide general comments on the proposed regulations and the content of this Consultation RIS.

If you choose not to answer the suggested questions, you should focus your comments on comparing the advantages and disadvantages of the proposed reform options.

Please provide written feedback on the proposed options by close of business on Friday, 31 August 2018.

Following the consultation process, a Decision RIS will be produced, providing final recommendations on the proposed reforms.

1. Statement of the problem

1.1 Heavy vehicle road charging and investment in Australia

The Australian Government and the state, territory and local governments fund the construction and maintenance government-managed roads. Governments collect a range of road-related revenues from operators of light and heavy vehicles, including via fuel-based charges and registration charges. However, in general, there is no direct link between the revenue they receive and the funding of roads.

While heavy vehicles make up a small percentage (approximately 3%) of vehicles on Australia's roads, they create the need for a significant proportion of road construction and maintenance.

In using the road network, heavy vehicles incur two main charges: a fuel-based road user charge (RUC), which is collected by the Australian Government; and registration charges, which are collected by state and territory governments.

Since 1992, the National Transport Commission (NTC) has made periodic recommendations to the Transport and Infrastructure Council (TIC) about heavy vehicle charges.² The Australian Government and individual states and territories have discretion to adopt the recommended charges.

1.2 The nature of the problems

In 2006, the Productivity Commission found that 'current pricing and regulatory arrangements are hampering the efficient provision and productive use of road and rail infrastructure' (PC 2006:xxvi) and recommended that governments pursue a reform program to improve efficiency and productivity within the road sector.

Some of the key problems with current pricing and regulatory arrangements include the following:

- **Current heavy vehicle charges do not provide a direct signal to road users about their road use.** More direct pricing signals to road users about the costs incurred by that use have the potential to encourage more efficient use of the road network, for example by taking more direct account of vehicle mass, distance travelled and location of travel. In this way, road users will choose vehicle types, routes and travel distances that best align with the road expenditure for which they create the need.
- **Road managers have limited information about travel by heavy vehicles.** Traffic counts by road agencies do not provide information on the types of vehicle and their masses. In addition, they are typically undertaken only periodically on a given road. While some weigh-in-motion stations are able to also provide some information on vehicle types and weights, only a limited number are in operation, and they are predominantly on high-use roads.

² The TIC consists of transport and infrastructure ministers from the Australian Government and state and territory governments, as well as the President of the Australian Local Government Association.

- **Currently, road managers' uncertainty about future revenue streams limits their ability to make long-term decisions.** This appears to be a particular problem for maintenance expenditure (i.e. expenditure which ensures that road pavements and bridges are maintained over time at an appropriate level), in which uncertainty limits managers' ability to use optimal lifecycle costing models. Typically, they are certain about expenditure for the first forecast year, but that certainty then declines rapidly with each subsequent year. The uncertainty reflects the disconnect between expenditure on roads and revenue obtained via the RUC and registration charges.
- **Current governance arrangements could be improved to provide greater scrutiny of the prudence and efficiency of expenditure.** While there has been some increased transparency of comparative data on capital expenditure (see, for example, BITRE 2018), there is scope for the use of benchmarking data to provide insights into the relative efficiency of capital expenditure and maintenance expenditure, in terms of both the underlying unit costs and the allocation of expenditure across projects and roads. It is noted that states and territories currently use some forms of scrutiny, including internal oversight processes, budgetary oversight processes, parliamentary oversight and Auditor General reviews. However, those approaches are not necessarily consistent across governments, and what extent to which those processes are driving improved efficiency is not clear. Additionally, while there is often some scrutiny of significant capital expenditures through internal government processes, there is much less for maintenance expenditures—which are crucial for levels of service experienced on roads.
- **Heavy vehicle charges are set at the discretion of government ministers,** which can result in registration charges for one or more state and territory governments (or the RUC, which is set by the Australian Government) not being set at a level consistent with total cost recovery or in charges being set at the vehicle class level that allows for cross-subsidies. Currently, the TIC has agreed on charges be set at a level that does not follow the recommended charges of the NTC, and the Western Australian and Northern Territory governments do not align at the vehicle class level—resulting in different registration charges from those in other states and territories.

1.2.1 The magnitude of the problems

Due to the large expenditure that occurs on road capital programs as well as maintenance and operations (\$26 billion in 2015–16 across all governments; BITRE 2017:41), the magnitude of the problems in the current system is likely to be significant. This also indicates that the potential benefits that could arise from reform may also be significant.

A recent study for the Australian Government by Deloitte Access Economics (DAE 2017) estimated that the net benefits of full end-state reform of heavy vehicle charging and investment arrangements would be between \$8.5 billion and \$17.4 billion in net present value (2017 dollar) terms, assuming a 20-year time horizon.³

The reform components in this Regulation Impact Statement (RIS) are likely to address a proportion of those total end-state net benefits. This is explored in further detail in section 5, which indicates which parts of the total estimated DAE (2017) end-state benefits are likely to be realised by the reform components in the RIS.

³ This report can be accessed at <https://infrastructure.gov.au/roads/heavy/>. Refer to the executive summary for an outline of the scope, approach, methodology and assumptions under which the report was written.

1.2.2 Scope of the reforms considered in this RIS

It should be noted that the reforms considered in this RIS will not resolve all the problems identified above. However, if all the phases of reform are undertaken (as outlined in section 2.1), then it is likely that those problems will be either alleviated or removed entirely.

2. Objectives of government action

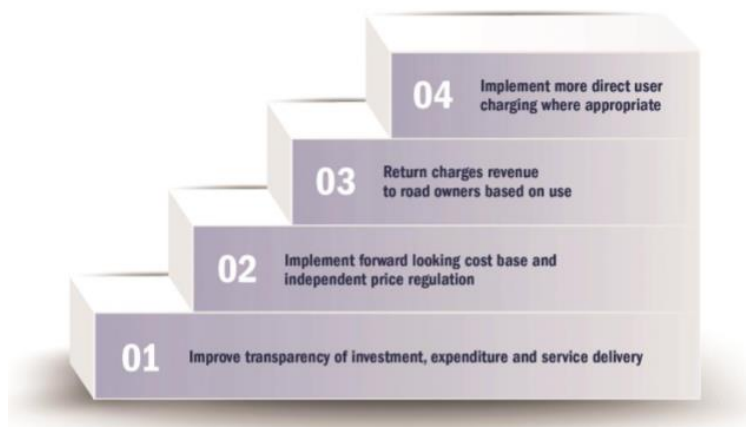
2.1 Broader heavy vehicle road reform objectives

To address problems with the current heavy vehicle charging and investment arrangements, the TIC agreed in May 2015 to progress HVRR and:

agreed a longer-term road map which outlines the sequence of institutional and governance reform steps along the path to full market reform of heavy vehicle investment and charging arrangements. (TIC 2015)

The TIC's reform road map (Figure 1) sets out the proposed four phases of reform.

Figure 1: Overview of the heavy vehicle reform road map



Source: TIC (2017a).

The ultimate objective of HVRR is to turn the provision of heavy vehicle road infrastructure into an economic service, where feasible:

This would see a market established that links the needs of heavy vehicle users with the level of service they receive, the charges they pay and the investment of those charges back into road services. (TIC 2017a)

The key features of this new approach include the following.

- **Improved investment coordination and planning:** Investment plans take into account industry priorities and community service obligations.
- **Independent economic regulation:** Reforms to governance and regulation arrangements provide the framework to enable and enhance reforms to heavy vehicle road charging and funding and constitute full economic regulation, giving oversight of pricing and road investments, involving a framework similar to those currently used in other sectors, such as water, energy and telecommunications. This type of reform should enable heavy vehicle charges to be set to recover economically efficient road management investments and to meet agreed service standards.
- **For road managers:** Road services are delivered to defined standards according to agreed investment plans. To support this, road managers gain funding certainty to promote long-term planning and asset optimisation.

- **For heavy vehicle operators:** Road users pay charges that more directly reflect the costs imposed by road users on the road network. This is sometimes referred to as ‘direct charging’, as charges more closely reflect the nature of road use that affects the cost of road provision, such as the weight on each vehicle axle, the distance travelled by a vehicle and the location of travel. This should result in road users choosing vehicle types and roads that more closely align with the costs they impose.

The change in road use associated with more reflective charges enables road managers to improve investment decisions and the setting of levels of service.

- **Revised funding arrangements:** A more direct link is established between heavy vehicle charging revenue and funds available for road investments. This type of reform should improve the ability of road managers to invest in capital expenditure and maintenance projects that best maximise net benefits for road managers and road users.

The achievement of a new charging and investment model that incorporates some form of all of these components is defined in this RIS as ‘end-state reform’. HVRR is being pursued as a potential forerunner of broader reforms that could apply for all vehicles, although decisions on whether to pursue full market reform are probably still a number of years away.

2.2 Objectives for reform in this RIS

In summary, the objective of the HVRR Phase 2 reforms considered in this RIS is to implement key steps towards full economic regulation of heavy vehicle road expenditure by reforming governance and charging arrangements as well as introducing mechanisms to allow for improvements to investment prioritisation.

Phase 1 of the reform program was substantively completed in 2016 following the publication of asset registers and expenditure plans and the development of a framework for operators to negotiate and pay for improved access (TIC 2017a). However, asset registers and expenditure plans continue to be refined and improved.

In November 2017, the TIC (2017b) agreed to progress with Phase 2 of the reforms and develop a RIS to examine the costs and benefits of the implementation of independent price regulation and a forward-looking cost base (FLCB).

This RIS is a key part of implementing Phase 2 of the heavy vehicle reform road map. While the proposed reform components in the RIS do not address full end-state reform of heavy vehicle charging and investment arrangements, the aim of Phase 2 reforms is to partially address the key problems with current arrangements. The reforms in the RIS achieve this by the following means:

- **Reforming governance arrangements to provide for independent price regulation,** which involves establishing an independent price regulator with powers to set prices independently of government and potentially perform a range of oversight activities to improve the efficiency of expenditure by road agencies. Independent price regulation is a step towards full economic regulation, which is part of the end state of the reform. Moreover, it is part of the shift to a more accountable system that includes independent examination of expenditure proposals and service levels.
- **Reforming charging arrangements so that more efficient charging structures can be implemented,** including implementing an FLCB and allowing an independent price regulator (IPR) to alter the proportion of total charging revenue received from the RUC.

- **Introducing mechanisms that allow for investment to be prioritised, with a closer and more transparent link to the needs of users**, by potentially implementing a customer service charter on key freight routes and more formal industry consultation processes on pricing decisions.

The benefits of these reforms are further explored in section 5.

3. Reform options considered

As set out in the previous section, this RIS relates to reforms under Phase 2 of the broader HVRR program. The core elements of Phase 2 relate to the establishment of an IPR and the implementation of an FLCB.

As part of the settings under which an IPR and FLCB could operate, a number of related supporting reforms are also included. They relate to:

- road user consultation;
- levels of service; and
- data requirements.

For clarity, there are some elements that relate to an FLCB that are beyond the scope of this RIS. The RIS does not consider financial policy settings that are yet to be determined, such as:

- allocation of costs between heavy and light vehicles;
- valuation of the regulated asset base; and,
- how the cost of capital will be determined.

3.1 Options considered

In developing the options for analysis, two alternative reform options for implementing an IPR and FLCB were identified:

- Reform option A implements a simple level of independent price regulation.
- Reform option B is a larger step involving slightly more ambitious regulatory reforms.

The broad intention of Option B is that it forms—across a number of parameters—a more ambitious starting point for an IPR than the basic IPR settings under Option A. Option B thus can be seen as a bit further along the continuum from current practice to the end state of full economic regulation. This is illustrated in Figure 2.

Figure 2: Continuum of reform of independent price regulation and the use of a forward-looking cost base

.....			
Current system	Option A (most basic IPR)	Option B IPR plus	Full economic regulation

In addition to the two reform options, the option of rejecting the reforms and retaining the current arrangements remains valid.

Accordingly, the three possible reform options are:

- **Rejection of the proposed reforms:** Continuation of ‘business as usual’. We refer to this as the ‘base case’.

- **Reform option A:** ‘Basic price regulation’. This would be the simplest model under which an IPR might operate, with minimal change to other current settings.
- **Reform option B:** ‘Price regulation plus’. This would be a somewhat more sophisticated model under which an IPR might operate, with some changes to other current settings.

The detailed parameters for these options are summarised in Table 1; a full description of each parameter is provided in Appendix 1 of this RIS.

3.2 Identification of all viable options

Option A and Option B are seen as covering all viable options for the current phase of HVRR.

During the preparation of this Consultation RIS, the only variation to those options that was identified was the possible use of multiple state-run independent regulators rather than one national independent regulator. However, this was not considered in detail for the following reasons:

- There was broad consensus supporting one national IPR during a recent public consultation.⁴
- There is no clear model for state regulators setting the fuel-based RUC, assuming that national charging arrangements for the RUC are harmonised and that it continues to be set under federal legislation.
- No additional economic benefits from implementing a multi-regulator model compared to one national regulator were identified.
- It appeared likely that this variation would increase costs.

⁴ In 2017, the Department of Infrastructure and Regional Development published a discussion paper on three possible structures for an IPR. The consultation process ran for a period of 7 seven weeks, and a total of 26 consultation responses were received (DIRD 2017).

Table 1: Proposed reform model parameters

Parameter	Reform option A	Reform option B
1. Network coverage	All roads currently covered under pay-as-you-go (PAYGO).	
2. Independent regulation	<i>Basic price regulation</i> See below.	<i>Price regulation plus</i> - Some additional scrutiny of expenditure, but no power to disallow - Formal mechanism for user input into pricing determinations (e.g. expert panel) - Can alter the mix of registration charges and RUC, but changes are to be revenue neutral to governments.^a
	The IPR: - reviews expenditure proposals to ensure consistency with the scope of the charging system - requires expenditure proposals in comparable formats - sets a suitable rate of return - corrects for under- and over-expenditure in the previous period (a 'true-up' mechanism) - determines prices in law.	
3. Forward-looking cost base	Apply a building-block model (BBM) to determine allowed revenue. One BBM for each state or territory government.	
4. Levels of service	No change to existing levels of service.	Customer service charter for key freight routes (not a legally binding commitment).
5. Data requirements	Maintain existing data measurement and reporting.	Improved data measurement and reporting to assist with expenditure oversight. This will apply only to state and territory roads.
6. Price setting	Regulator sets a band of allowable registration charges, which allows jurisdictions to move towards nationally consistent charges during a transition period.	
7. Hypothecation / funding reform	Maintain the existing system of funding via government budget processes (with general lack of hypothecation and transparency).	
8. Community service obligations	Maintain existing funding to ensure minimum levels of service on all roads.	

^a The NTC currently has the ability to recommend changes to the mix of registration and road user charges. However, changes to the mix are typically constrained as it impacts the respective revenues of federal and state governments. Under the reform being proposed, the mix is able to change with the assumption that any change in the registration portion of the charging mix would see States and Territories receive a corresponding allocation of fuel excise receipts to maintain each state's total share of current revenue received. It is also noted that any changes to federal financial relations arising from decisions about the IPR and FLCB would be considered separately by the relevant cross-jurisdiction working group.

4. Impact analysis approach

The impact analysis seeks to identify and, where possible, quantify the additional or incremental costs and benefits of each of the reform options relative to the base case.

The impact analysis considers multiple forms of analysis, such as:

- cost–benefit analysis (CBA);
- regulatory burden measurement;
- risk analysis; and
- analysis of competition and other impacts.

This section sets out the approach used in the CBA and the regulatory burden measurement, while the following sections set out the full range of identified benefits and costs and the results of each element of the impact analysis.

4.1 Cost–benefit analysis approach

The purpose of the CBA is to give stakeholders an indication of the likely impacts that would arise from implementing each of the options and to give decision-makers an indication of the option that is likely to deliver the greatest benefit to the community as a whole.

The CBA considered the expected cost impacts on, and benefits to, business, government and the wider community that would arise from each reform option. It identified the net present value of the costs and benefits over 20 years, as well as the distribution of costs and benefits, and included a sensitivity analysis.

Marsden Jacob’s CBA method is consistent with Australian Government guidance on identifying the costs and benefits of legislative change (DoF 2006; PM&C 2014, 2016). The analysis captured:

- the initial set-up and transition costs;
- changes in the level of ongoing costs and benefits; and
- the distribution of costs and benefits to different stakeholder groups—industry, government, workers and the broader community.

This section sets out the approach to the CBA, including the assessment of alternative reform options under multiple future reform scenarios.

The identification and valuation of benefits and costs are explained in sections 5 and 6, respectively.

The results of the CBA are set out in section 7.

4.2 Future reform scenarios

While this RIS focuses on currently proposed reforms, it is useful to assess those reforms under both a scenario in which no further reform is undertaken and a scenario in which further reforms occur.

Our analytical approach has been based on the following premises:

- Rejecting the proposed reforms would not stop further reforms, but may delay them.
- Accepting a reform now does not guarantee further reforms.

On this basis, the benefits and costs were estimated under two scenarios:

- Scenario 1: No further reform.
- Scenario 2: Further reform undertaken.

For the purposes of this RIS, further reform is defined as the implementation of phases 3 and 4 of the HVRR road map. Broadly speaking, phases 3 and 4 result in end-state reform (as described in section 2.1) in which a market is established that links heavy vehicle users' needs with the level of service they receive, the charges they pay and the investment of those charges back into heavy vehicle road services.

Therefore, Scenario 1 represents a situation in which further reform does not occur even if Reform option A or B is undertaken. In contrast, Scenario 2 represents a situation in which further reforms are undertaken, and the end-state reform is subsequently reached at a time later than the current Phase 2 reforms. Importantly, the timing of further reforms may be affected by the decision to either not undertake the proposed reforms or to implement Reform option A or B.

The framework for the assessment of the three reform options (base case, Option A and Option B) and the two scenarios is summarised in Table 2.

Table 2: Framework for assessing the options and scenarios

	Scenario 1: No further reform	Scenario 2: Further reform undertaken
Reject current reforms (base case)	Heavy vehicle reforms stall indefinitely	- Heavy vehicle reforms stall for a period of time - Phases 2 and 3 (or equivalent) implemented post 2020 - Full end state reached after mid 2020s (i.e. at a time after that would have been achieved under Reform option A or B)
	- No additional cost - No additional benefits	- No additional cost - No additional benefits
Option A	Option A is implemented, but further heavy vehicle reforms stall indefinitely	- Reform option A is implemented in 2020 and reforms continue - Phase 3 is implemented shortly after - Full end state is reached in mid-2020s
	Only costs and benefits directly attributed to Option A are relevant	The full end state is reached earlier than under the base case
Option B	Option B is implemented, but further heavy vehicle reforms stall indefinitely	- Reform option B is implemented in 2020 and reforms continue - Phase 3 is implemented shortly after - Full end state is reached in mid-2020s
	Only costs and benefits directly attributed to Option B are relevant	The full end state is reached earlier than under the base case

Source: Marsden Jacob analysis.

4.3 Regulatory burden measurement approach

In addition to providing a CBA, we have considered the impact on industry from complying with the changes in requirements that would occur under the reform options.

The assessment of changes in industry costs is often referred to as ‘regulatory burden measurement’ and focuses only on changes in private-sector costs. Furthermore, regulatory burden does not include costs of actions that the industry would take anyway, which are referred to as ‘business as usual’ costs.

Regulatory burden measurement uses some of the same data collected for the CBA but categorises and presents the data in a different manner.

The questions posed in this Consultation RIS will allow the assessment of the costs and benefits of the reform options as well as their impacts on regulatory burden.

Our approach for classifying and presenting impacts on regulatory burden follows Australian Government guidance (PM&C 2017). The approach classifies all industry costs as administrative compliance costs, substantive compliance costs or delay costs:

- **Administrative compliance costs** are primarily driven by the need to demonstrate compliance with regulations, such as compulsory reporting.
- **Substantive compliance costs** constitute more substantive amounts (compared with administrative costs) that are directly attributable to the regulatory requirements and that fall outside of business-as-usual costs. These costs may include the capital costs of plant upgrades as well as operational costs for process changes or additional staff training.
- **Delay costs** include the time taken for the preparation of applications (referred to as ‘application delay’) and the time taken for approvals (referred to as ‘approval delay’). Estimating the cost savings from removing delays requires a strong understanding of realistically achievable time frames, the likely delays that could be avoided and the value (the potential cost) of any avoidable delay.

The results of the regulatory burden measurement are provided in the required format in section 7.2; however, the nature of the reforms means that there is not expected to be any regulatory burden arising under either Option A or Option B.

Two possible forms of regulatory burden were considered in detail. They were:

- the impact of possible changes to the fees and charges paid by heavy vehicle operators, such as fuel excise and registration fees; and
- the time that could be spent by industry stakeholders (either providers of road transport services or companies that use road transport services) on preparing submissions as part of the setting of fuel excise and registration fees under an IPR and FLCB.

Impact of possible changes to the fees and charges paid by heavy vehicles

The *Regulatory burden measurement framework: guidance note* (PM&C 2017) specifically notes that government fees, charges and taxes are not considered to be regulatory burden and are excluded from the analysis.

For that reason, any possible changes in fees, charges and taxes are not included in the regulatory burden measurement results. However, as the potential for changes in fees and charges is likely to be a point of concern for industry, the potential impacts are discussed in further detail below.

As set out in Appendix 1 of this RIS, under details of the proposed reforms to the FLCB, key principles proposed for the reform are that the initial prices (and revenues) should be similar to current levels and that there is a smooth transition to any new price. This approach would remove any price shock risk for heavy vehicle road users and any revenue shock risk for jurisdictions. There are two alternative strategies that could be used to achieve that outcome:

- **Line in the sand:** This involves multiplying the initial regulatory asset base by a factor (which may be greater or less than 1) to ensure that the total revenue equates to historical levels.
- **Zero regulatory asset base:** This is achieved by setting the opening regulatory asset base to zero value and bringing forward revenue to achieve a targeted transition price path.

It is proposed that initially the cost base will be set so that jurisdictions have the same revenue for road management (capital, operating and maintenance expenditure) as is provided under the current PAYGO (pay as you go) system. To maintain the same revenue for road management and also finance the increase in government costs that would arise under Reform options A and

B, this may require a small increase in fees. It is assumed that this increase would be collected through the RUC and registration fees.

The cost increases for states and territories are set out in section 6 of this RIS. It should be remembered that any increase in fees to fund the establishment of an IPR and FLCB would need to be considered relative to the total funds allocated to heavy vehicle road maintenance and upgrades. Currently, the heavy vehicle cost base is estimated to be around \$3 billion (NTC 2014), and that is the annual amount against which cost-recovery charges are set; so, as an example, an increase of \$3 million in annual costs would represent a 0.1% increase in total costs to be collected through fees.

Time spent by industry stakeholders on preparing submissions

In assessing the regulatory burden, we considered that time spent by industry associations in providing submissions to the determination of the FLCB would be time spent voluntarily, and so is not considered to be regulatory burden.

As noted in section 6, we do not have solid data on the time currently spent by industry in contributing to the PAYGO model or on expected increases in time under Reform options A and B.

Stakeholder input on these current and expected costs is welcome.

5. Identification and valuation of benefits arising from reform

Our analysis uses two hypothetical scenarios:

- No further reform
- Further reforms are undertaken.

5.1 Scenario 1: No further reform

5.1.1 Types of benefits

Under Scenario 1, benefits are defined in terms of:

- benefits that apply to both Reform option A and Reform option B; and
- benefits that apply only to Reform option B.

Drawing on some initial discussions with the Australian Government and state and territory governments, the key potential types of benefits are summarised in Table 3 and Table 4, which illustrate the link between the reform components and the intermediate and final outcomes that could potentially flow from the reforms.

Potential benefits that apply to both Reform option A and Reform option B

Table 3 lists potential benefits that apply to both reform options.

Table 3: Potential benefits that apply to both Reform option A and Reform option B

Reform component	Intermediate outcome	Final outcome
Forward-looking cost estimate	→ Improvement in forward planning of capital expenditure and maintenance programs	Lower maintenance costs , as maintenance works are more aligned with an optimal lifecycle approach. The maintenance cost savings are likely to enable additional works, thereby increasing overall service levels for road users.
	→ Improvement in asset management capability and systems	→ Improved overall service levels and hence lower vehicle operating costs for road users, as it may encourage capital expenditure allocation to projects in a way that achieves greater long-term benefits for heavy vehicle road users.
	→ Greater price stability for heavy vehicle road users compared to a PAYGO approach	→ Greater productivity for road users , as it may encourage new vehicle investment even when capital expenditure on roads is lumpy. → Lower adjustment costs for heavy vehicle road users , as they are less likely to change vehicle configurations.
The IPR determines prices in law	→ More transparent, predictable and de-politicised charges for heavy vehicle road users	→ Greater confidence by the transport industry in the charge-setting process , as it enables more a more transparent and predictable process.
State/territory governments able to transition to new charges between regulatory periods	→ Greater price stability for heavy vehicle road users	→ Lower adjustment costs for heavy vehicle road users. → More sustainable charging system , as it allows for a transition period.
Enhanced independent scrutiny of expenditure categorisation	→ Heavy vehicle charges better reflect expenditures	→ More cost-reflective charges , which may act to more encourage more efficient road use.

Forward-looking cost base

Under the proposed new regulatory framework for Reform options A and B, an FLCB involves road managers articulating to the IPR their forward plans for investment in maintenance and capacity expansion across all of the roads that they manage. As part of this process, road managers' forward expenditure would be made transparent via a public process that would be part of the IPR's price setting.

Articulating forward plans has the potential to lead to greater scrutiny internally and externally of the way in which the plan has been put together for the IPR, its key assumptions and the key underlying projects. Additionally, articulating forward plans may also lead to improved asset

management capability and systems as road managers act to enhance the robustness of their forward expenditures.

The potential consequences of this are:

- lower overall maintenance costs, as it may encourage road managers to align their forward maintenance with an optimal long-term lifecycle approach to pavement maintenance and rehabilitation (note that cost savings are likely to be reallocated to other important maintenance works, which improves overall levels of service); the impact on maintenance costs will depend on the extent to which implementing an FLCB influences maintenance planning and optimisation; and
- greater overall service levels for road users, as it may encourage road managers to allocate maintenance and capital expenditure to projects in a way that achieves greater long-term benefits for heavy vehicle road users.

An FLCB should also result in greater price stability for heavy vehicle road users compared to the current PAYGO approach applied by the NTC.⁵ Under the current NTC costing and charging model, the cost base is established by an exponential moving average of 7 years of historical nominal expenditure.⁶ In contrast, under the building-block model, capital expenditure is spread over the useful life of the asset. The useful life of many road assets is likely to be over much longer periods than 7 years. Therefore, under the building-block model, lumpy capital expenditure will not have the short-term impact that occurs under the current NTC charging model.

A range of benefits for road users may arise from greater stability in prices, as short-term price shocks may adversely affect efficient vehicle purchasing decisions. For example, lumpy capital expenditure on roads under the PAYGO approach will likely lead to short-term increases in charges. This may cause road users to defer vehicle purchasing decisions even though the road investments that cause the lumpiness in expenditure have a long life.

Greater stability of prices may also result in lower adjustment costs for heavy vehicle road users. This is because price shocks may create an incentive for road users to change vehicle configurations and hence result in switching costs that they would not otherwise incur.

The IPR determines prices in law

The IPR will determine heavy vehicle prices independent of government. This avoids the current situation in which an individual state or territory can decide to set prices that are not consistent with prices that have been agreed at the Transport and Infrastructure Council and via a process that is not transparent. The independence of the regulator should, therefore, lead to greater transparency in decisions on charges and a de-politicised and more predictable charges-setting process.

State and territory governments able to transition to new charges

At the beginning of each regulatory control period (which is the period over which charges are set under an FLCB), prices will rise or fall depending on how new charges compare to charges in the previous period. State and territory governments will be able to transition to the new charges by phasing in the increase or decrease in charges over a period of time (for example, 3 to 4 years).

⁵ The price stability benefit discussed in this section assumes that future prices, without the implementation of Reform options A or B, will largely be set with reference to the calculated charges under the NTC PAYGO model.

⁶ ‘The EMA or “exponentially weighted moving average” is a particular type of weighted moving average where the weighting for each subsequent datum point will decrease exponentially’ (NTC 2014).

Therefore, similarly to the potential benefits from an FLCB, the ability to transition or phase in charges acts to provide for greater price stability, as it avoids price shocks each time charges are reset.

Additionally, the ability of road users to transition charges may make the new regulatory model more sustainable, as it allows state and territory governments to take into account state-based issues in the short term.

Enhanced scrutiny of expenditure categorisation

Under the current NTC charge-setting process, state and territory governments prepare historical expenditure for the NTC in an expenditure template that has defined expenditure categories and supporting guidelines for how road manager expenditure is to be placed into the defined categories. The NTC has historically undertaken informal and formal checks of the alignment, consistency and accuracy of state government road expenditure with the current expenditure template (and supporting guidelines). However, the NTC does not currently have formal powers to compel state and territory governments to participate in review processes.

Under Reform options A and B, the IPR would be able to undertake formal scrutiny and review processes (which compel governments to participate) in order to scrutinise and review the alignment of proposed forward-looking expenditure with the IPR's guidelines.

This enhanced process has greater potential than under the current regulatory environment to identify expenditure that should either be excluded or included from proposed expenditure in accordance with the IPR's guidelines. This may act to either increase or decrease the overall size of costs allocated to heavy vehicles. More cost-reflective charging has the potential to lead to more efficient decisions by freight and supply-chain operators when they are faced with the true cost of road use—such as decisions on vehicle choice, mode choice, supply-chain configuration and so on.

Better aligned expenditure may also affect the costs allocated to different vehicle classes, as some expenditure types have a higher proportion of cost allocated to some vehicle types than others. For example, if it results in higher (or lower) road rehabilitation costs, that could result in relatively more (or less) being allocated to vehicle classes that cause relatively more (or less) road wear. Assuming that this results in a more efficient allocation of costs, this has the potential to beneficially affect the relative use of different vehicle classes and hence overall vehicle operating costs.

However, while this reform component is likely to improve the robustness of the charge-setting process and the cost-reflectiveness of charges, it is not likely to have a material impact on overall charges for individual vehicle classes unless there are reasonably significant misalignment issues. It is noted that a previous review by the NTC did not highlight significant misalignments with the current expenditure template.

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Potential benefits that apply only to Reform option B

Table 4 lists potential benefits that apply only to Reform option B.

Table 4: Potential benefits that apply only to Reform option B

Reform components	Intermediate outcome	Final outcome
Additional scrutiny and transparency of capacity expansion expenditure decisions	Comparative benchmarking analysis across governments may indicate potential for improvements in decision-making	→ Greater net benefits , which result from governments selecting capacity expansion projects that have relatively higher benefit–cost ratios.
Development of comparative datasets on capacity expansion	Road managers more accountable for investment decisions	
Additional scrutiny and transparency of road maintenance expenditure decisions	Comparative benchmarking analysis of maintenance costs and levels of service across governments may highlight areas for improvement	→ Lower maintenance costs because there is a drive for greater efficiency from benchmarking.
Development of comparative datasets on maintenance activities, road use and levels of service	Road managers more accountable for investment decisions	→ Improved levels of service and hence lower vehicle operating costs on some key routes by better targeted maintenance works.
Regulator able to alter the mix of RUC and registration charges (but revenue neutral for governments)	→ RUC may increase to align more closely with efficient price structures	→ Lower combined maintenance and vehicle operating costs , as road users may choose vehicle types and usage levels that more closely reflect the costs that are incurred by usage. Lower financing costs , as road users do not have to finance up-front registration costs.
	Enhanced focus on customer expectations of road management	
Customer service charter for key freight routes	→ Performance assessment by IPR indicates that there is scope for improvement in levels of service to meet the customer service charter	→ Improved levels of service and hence lower vehicle operating costs on some key routes from targeted capacity expansion or maintenance expenditures.
Formal mechanism for user input into pricing determinations and service levels (e.g. expert panel) and have regard to the advice of the expert panel	→ Forward expenditure plans are influenced by road user input on priority areas for capacity expansion and/or improved levels of service	→ Greater net benefits from road investments by better targeting capacity expansion and maintenance activities to high-need areas.

Scrutiny of expenditure with supporting data analysis

Under Reform option A, the IPR will undertake a basic level of scrutiny via review and audit of the alignment of proposed expenditure with IPR guidelines and *ex post* review of expenditure for ‘true-up’ purposes.

Under Reform option B, the IPR will undertake additional scrutiny of the efficiency and prudence of expenditure proposals (and past expenditure) assisted by comparative benchmarking, which will be supported by new data and analytical systems.

Moreover, the IPR would use comparative benchmarking across road managers using common datasets to publicly and transparently highlight the scope for improvements in investment decision-making and therefore improve the accountability of governments and road managers. This benchmarking has the potential to compare the efficiency of road expenditure by examining key issues, such as the following:

- The unit costs of road construction and maintenance: For example, how do construction costs per kilometre of road construction and maintenance compare across state and territory governments?
- The allocation of road funds across different roads: Are road funds allocated to roads with the highest need, taking into account target service levels, expenditure requirements and forecast demand?

For capacity expansion expenditure, comparative analysis by the IPR has the potential to highlight areas of inefficiency, which may provide an incentive for road managers and governments to select capacity expansion projects that have higher cost–benefit ratios than those that they would have chosen without the scrutiny by the IPR.

A range of existing processes already provide a level of scrutiny, such as internal state government processes as part of budget approval processes; funding proposals to Infrastructure Australia from state and territory governments⁷; and BITRE’s publication of benchmark data on road construction costs and key cost drivers (BITRE 2018). A key issue for this RIS is the extent to which additional scrutiny of a public nature that highlights relative inefficiencies across Australia in capacity expansion expenditure would provide an incentive for changes to expenditure processes.

Similar benchmarking analysis by the IPR of maintenance expenditure has the potential to highlight areas of inefficiency, which may provide an incentive for road managers to examine ways to reduce maintenance costs. While there is some internal state government scrutiny of maintenance expenditure, initial discussions with state and territory governments indicate that it does not appear to be as comprehensive as for capacity expansion expenditure.

In addition, compared to capacity expansion expenditure, there appears to be much greater scope for benefits from comparative benchmarking of maintenance costs (and their key drivers) across states and territories. This is because of the complexities in comparing maintenance expenditures across governments when there are many reasons that cause variations, and it is challenging to model and understand them without supporting data and analytical tools. Importantly, under Reform option B, the RIS allows for the development of the necessary

⁷ Note that Infrastructure Australia only undertake evaluations of project proposals that are nationally significant or where funding of more than \$100 million is sought from the Australian Government. Some states also have their own infrastructure advisory bodies.

information systems and data collection processes using the revised Austroads Data Standard as a common data language to enable effective comparative benchmarking of maintenance costs across state and territory governments.

Regulator able to alter the mix of road user charge and registration charges

A more efficient mix of the RUC and registration charges is likely to result in the RUC making up a higher proportion of total heavy vehicle charging revenue (see Appendix 1). This will result in a higher cost for road users based on their distance travelled but a lower annual registration charge. However, those vehicles that travel longer annual distances than the average for that vehicle class are likely to pay higher overall charges (when combining the total cost of registration and RUC charges). Conversely, those vehicles that travel shorter annual distances than the average for that vehicle class are likely to pay lower overall charges.

Importantly, a higher RUC may lead to lower combined vehicle operating and maintenance costs, as it may result in a range of potential beneficial changes to road use (such as vehicle choices, mass levels and distances travelled). It may also act to reduce financing costs (as registration charges are currently paid upfront). The value of this impact is further explored in section 5.1.2.

Customer service charter

A customer service charter enhances the focus of road managers on customer expectations of road management (that is, levels of service). The charter provides a form of commitment by road managers to a level of service on key freight routes that has the potential to result in an improved level of service.

Formal mechanism for industry input into pricing determinations and service levels

A more formal consultation mechanism for pricing determinations has the potential for the transport industry to influence future expenditure by road agencies. This could lead to changes to proposed capacity expansion and maintenance expenditure plans in ways that achieve greater net benefits for road users. Formal input by the transport industry into service levels (in particular, the customer service charter) has the potential to improve freight productivity (via lower vehicle operating costs) and has the potential to result in the quality of the road better reflecting the needs of users.

It is noted that state governments have existing consultation processes with the transport industry. Those processes are typically informal and project specific. Therefore, a key issue with the RIS is the extent to which a more formal and holistic process of involvement in future expenditure decision-making is likely to lead to beneficial changes.

Formal input into service levels is likely to be a relatively new process and has the potential to drive new types of changes to investment decisions.

5.1.2 Valuing benefits

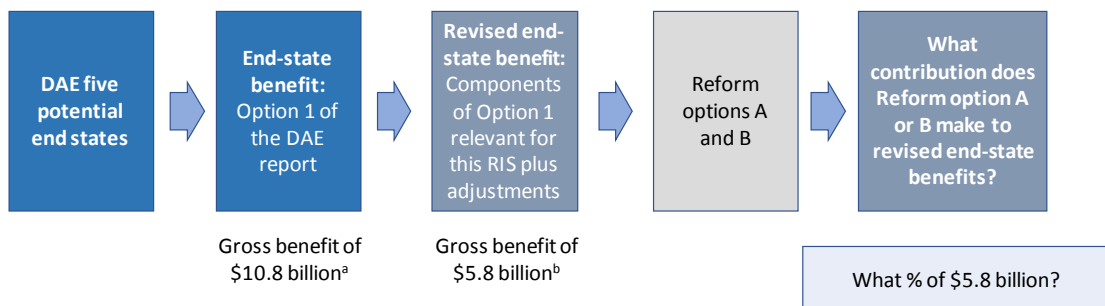
The framework for valuing the potential size of the benefits of reform involves first examining the likely benefits associated with end-state reform, with reference to the benefits estimated in a recent Deloitte Access Economics (DAE) report (DAE 2017), and then assessing the extent to which those benefits are likely to accrue under Reform options A and B (Figure 3). In particular, the approach involves:

- drawing on Option 1 of the DAE report to determine the value of potential end-state benefits that are relevant to this reform (estimated to be \$5.8 billion compared to the \$10.8 billion estimated under Option 1 of the DAE report;
- examining what proportion of the \$5.8 billion could potentially be expected to be achieved under Reform options A and B.

The results of this framework are applied in the net benefits section of the report (section 7) to help assess the likelihood that the benefits will be greater than the costs.

The framework is explained in more detail below. Base case benefits are estimated using a real discount rate of 7%.

Figure 3: Framework for examining benefits



DAE = 2013 and 2017 Deloitte Access Economics reports (DAE 2013, 2017).

DAE end-state reform benefits

Two reports by DAE (2013, 2017) estimated the total benefits of end-state reform under five reform options (Box 1). Option 1 in the DAE (2017) most closely reflects the reform components in Reform options A and B. The DAE report estimated the net benefits of Option 1 at \$10.8 billion in 2017 dollar terms. It also estimated that efficiencies in the order of 7%–38% could be achieved through operating efficiencies associated with economic regulation (through establishing an FLCB), improved governance and privatisation internationally. These efficiencies were not, however, included in DAE’s Option 1 value of \$10.8 billion but were included in the sensitivity analysis in DAE (2017).

Box 1: Deloitte Access Economics economic analysis of potential end-states for HVRR

In 2013, DAE was engaged during the Heavy Vehicle Road Charging and Investment Reform process to undertake a cost–benefit analysis of five potential end states of HVRR. That analysis was updated in 2017 for the Department of Infrastructure and Regional Development.

The five potential end states incorporate some or all of:

- more efficient charging approaches, such as fuel-based, distance and/or mass-based charging;
- returning revenue from road use back to road owners;
- improving road access for users by allowing higher productivity vehicles to operate on existing roads; and
- forward-looking pricing and economic regulation.

More details on the five end-states and key assumptions and modelling approaches can be found in the 2013 and 2017 reports. Note that the 2017 report updated a number of key assumptions from

the 2013 report.

Option 1 in DAE (2017) is the most relevant end state for this RIS. Option 1 comprises:

- the RUC as the revenue collection mechanism (i.e. no registration charges);
- incremental pricing (i.e. pay an additional charge for greater access), available for vehicles travelling above prescribed mass limits; and
- independent economic regulator, who oversees prudent and efficient costs and sets charges based on an FLCB.

Revised end-state benefit

The reform components in Reform options A and B do not fully align with Option 1 in DAE (2017). For example, Option 1 contains some components that are not relevant to Reform options A and B (e.g. improved vehicle access), and some adjustments have to be made to ensure that Option 1 is appropriate for use in the RIS (e.g. the maintenance benefits in the DAE report also include local governments, which is not considered under Reform options A or B).

To address this issue, the potential end-state benefit is revised down from \$10.8 billion to create a 'revised end state' of \$5.8 billion in present value terms. This is illustrated in Table 5, which shows that there are four DAE Option 1 end-state benefits that are relevant to Reform option A or B. A more detailed description of the end state as it relates to the \$5.8 billion is given below the table.

The revised end state has been developed so that the potential benefits of Reform options A and B can be better assessed.

Table 5: Value of end-state benefits: DAE Option 1 and revised (\$million present values)

Benefit from end-state reform	Option 1 end-state benefit in DAE report	Revised end-state benefits
More optimal lifecycle maintenance decisions	\$5,738	\$1,547
Increased efficiency from better governance	Modelled in sensitivity analysis	\$3,150
Better quality roads	\$2,048	\$1,115
Implementing a charging structure solely on the road user charge	\$303	\$17
Other vehicle operating costs and benefits	\$303	\$0
Vehicle access improvements	\$1,749	\$0
Externalities	\$517	\$0
Supply chain	\$176	\$0
Total	\$10,834	\$5,829

Source: Marsden Jacob analysis based on DAE (2017).

Note: Long-term annual benefits are all phased in over 10 years. Present values are estimated using a real discount rate of 7% and 20-year cash flows.

More optimal lifecycle maintenance decisions

The DAE Option 1 and revised end state assume that implementing an FLCB, combined with reforms to road funding, enable a whole-of-lifecycle approach for maintenance decisions to be implemented by road managers. A whole-of-lifecycle approach allows road managers to plan for maintenance over the lifecycle of the assets with greater certainty that costs will be recovered, thereby lowering overall maintenance costs.

Under the revised end state, the total potential benefit from lower maintenance costs is estimated at \$2.0 billion in present value terms. The maintenance saving is estimated at 8.6% of total current maintenance expenditure on arterial roads by state and territory governments. Unlike the DAE Option 1 end-state benefits, the revised end-state benefits include only benefits from lower costs of maintenance for state and territory government roads. This is because, unlike DAE Option 1, Reform options A and B do not incorporate reforms for local governments.

The 8.6% saving is sourced from DAE (2017:iii), which states that the potential end-state maintenance efficiency benefits that could arise from Option 1 would be 8.6% of total road maintenance costs. Total current maintenance expenditure by state and territory governments is estimated at \$2.5 billion in 2014–15 dollars using the NTC charging model (NTC 2018). This includes routine maintenance, periodic maintenance and rehabilitation expenditures for road pavements and bridges.

Increased efficiency from better governance through forward-looking pricing and economic regulation

The revised end state assumes that there is potential for increased efficiency from better governance through forward-looking pricing and economic regulation. Economic regulation has the potential to encourage road providers to make prudent and efficient long-term investment decisions via a range of key features of this form of regulation.

Those features include a form of price control (for example, a revenue cap), which acts to protect road users while ensuring that a road manager can remain profitable; incentive regulation, which encourages regulated entities to identify and pursue efficiency measures; efficiency benchmarking; and the power to approve or reject investment, capital and maintenance expenditure programs after assessing whether proposed investments in road infrastructure are prudent and beneficial from an economic perspective.

For the revised end state, the total potential benefit from increased efficiency through better governance is estimated at \$3.2 billion in present value terms. This is based on an annual benefit of 7% of \$6.4 billion, which is phased in over 10 years. The 7% draws on DAE (2017), which indicates that, based on Deloitte Access Economics' literature review, efficiency savings in the order of 7% to 38% could be achieved from introducing economic regulation, improved governance and privatisation.

The lower bound of 7% is applied, taking into consideration the strong influence of the privatisation of public utilities in the examples used to generate this range.⁸ The \$6.4 billion refers to estimated annual capital expenditure by state and territory governments in 2014–15 dollars using the NTC charging model (NTC 2018). Maintenance expenditure has been excluded to avoid potential double-counting of the benefits of lower maintenance costs.

⁸ The DAE (2017) does not quantify the benefits of improved governance because of the difficulty with attribution, although it applies efficiency savings of 15% to 25% from better governance and investment decision-making in its sensitivity analysis.

Better quality roads, leading to lower vehicle operating costs

Better quality roads are potential end-state benefits from a more economically efficient level of road quality, as road funding will be more closely aligned with road use. In particular, the DAE report assumes an annual 0.4% improvement in road roughness, thereby leading to vehicle operating cost savings for road users.

The DAE report (Option 1) estimates the total potential benefit from better quality roads at \$2.0 billion in 2017 present value dollar terms (or \$1.6 billion in 2013 present value dollar terms). The benefit under the revised end state is estimated at \$1.1 billion, as Reform options A or B include only benefits from state and territory government roads. This is because, unlike DAE Option 1, Reform options A and B do not incorporate reforms for local governments.

The estimated benefit for road quality of \$1.1 billion is a net benefit that takes into account both the gross benefit and the incremental cost (estimated by DAE at \$290 million in 2017 present value dollar terms) of delivering better quality roads.

More efficient pricing, leading to lower combined maintenance and vehicle operating costs

A shift to a higher proportion of heavy vehicle revenues from the RUC has the potential to lead to more efficient heavy vehicle charging. In particular, a higher RUC has the potential to lead to a change in the composition of heavy vehicle types and therefore reductions in combined road maintenance and vehicle operating costs. Additionally, a higher RUC has the potential to reduce the overall cost of financing registration charges.

The DAE report (Option 1) estimates the end-state benefits associated with a higher RUC (at 100% of charging revenue) at \$302.5 million in present value terms (2017 dollars), comprising \$0.27 million relating to lower vehicle operating costs associated with a shift in vehicle types and \$302.25 million in savings in financing costs.

The revised end state makes several adjustments to these estimated benefits, thereby resulting in a revised benefit of \$16.7 million in present value terms (2017 dollars). These adjustments are made to the financing benefit and take into account the following:

- Across Australia, heavy vehicles are typically able to purchase 3-month registrations, rather than the 12-month registration time frame assumed in the DAE model.
- The optimal efficient RUC as estimated by the NTC is 72% of total charging revenue (NTC 2014:v) compared to a current value of 60%. The DAE model appears to assume an RUC of 100% of charging revenue.
- The DAE analysis does not include higher additional funding costs for governments, as they will no longer receive registration revenue up front.

The small magnitude of the revised end state for an efficient level of the RUC is reasonably consistent with other reports that have examined the impact of a higher RUC:

- The evaluation of heavy vehicle charging options for the COAG Road Reform Plan (COAG 2011) estimated that the ‘fuel only’ option would deliver benefits of between \$–\$0.2 million and \$17.0 million per annum.
- The most recent NTC charging determination (NTC 2014) indicated that ‘total charges represent a small portion of total costs’ and that none of the charging options considered in the charging determination (including a 72% RUC option, which is what we have assumed for Reform option B) are likely to change the underlying cost dynamics.

Other DAE benefits not included in revised end-state benefits

Three other benefits identified in the DAE report for Option 1 are not included in the revised end-state benefits:

- Other vehicle operating costs and benefits: These are not included, as they relate to the interaction of a number of benefit components and are not able to be attributed to any one benefit.
- Vehicle access improvement: This is not included, as improved access for higher productivity vehicles (which forms part of the DAE Option 1 end state) is not included in Reform option A or B.
- Externalities and supply chain: These include externality benefits such as fewer accidents, lower air pollution and lower greenhouse gas emissions. Taking into account the very small benefits from changes to road use behaviour implicit in the estimated benefits of a higher RUC (and that the efficient RUC level is only 72% and not the 100% level assumed in the DAE report), the externality benefits are excluded from the analysis. A similar logic is used to exclude supply-chain benefits.

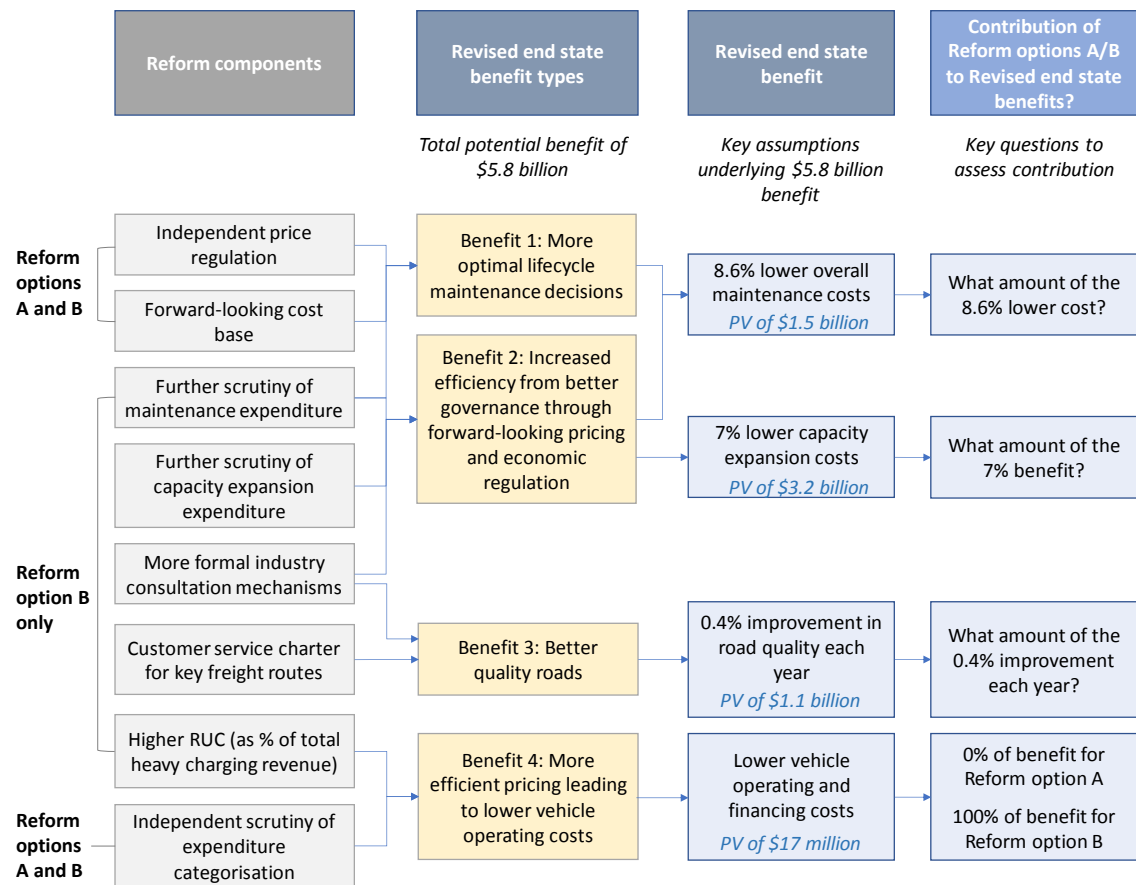
Reform options A and B: contribution to revised end-state reform benefits

A key question for this RIS is ‘What proportion of the revised end-state benefits are likely to be achieved under Reform options A and B?’

Figure 4 illustrates which components of Reform options A and B have the potential to contribute to the revised end-state benefits. Additionally, it illustrates the key questions to ask when assessing the potential contribution of Reform option A or B to the revised end-state benefit.

For example, a number of reform components have the potential to partly contribute to Benefit 1 (lower maintenance costs). So a key question for this RIS is the amount of the potential revised end-state benefit of 8.6% lower maintenance costs that could be achieved under Reform option A or B.

Figure 4: Contribution of Reform options A and B to end-state benefits



Key factors to consider in assessing the potential contribution

To assess the potential for the reform components under Reform options A and B to contribute to revised end-state benefits, it is useful to consider a number of key factors that may either enable to be realised or limit them. These factors assist in determining the size of the contribution (for example, how much Reform option A or B will contribute to the 8.6% lower maintenance cost under revised end-state reform).

Table 6: Factors to consider when assessing size of benefits

Revised end-state benefit	Factors that may enable benefits to be realised	Factors that may limit benefit realisation
Benefit 1: More optimal lifecycle maintenance decisions	- An FLCB may have some impact on forward planning of capacity expansion expenditure and maintenance programs, as it may encourage road managers to focus more on customer needs and efficient investment over the longer term, while also improving their asset management systems. - Additional scrutiny of maintenance expenditure may encourage lower maintenance costs (see benefit 2).	- An FLCB that involves only a 1- or 2-year forecast may not result in much change, as state governments already largely plan at that level. - Without a more direct link between road managers' revenues and road use, it is challenging for road managers to implement a more optimal lifecycle maintenance plan.
Benefit 2: Increased efficiency from better governance through forward-looking pricing and independent price and/or economic regulation	- By publicly highlighting areas where road managers may be able to reduce costs or improve the efficiency of their investments, the IPR has the potential to place a level of public scrutiny on expenditure proposals (and past expenditure) that does not currently exist. - Scrutiny will be assisted by comparative benchmarking of expenditure across states and territories, which will be supported by new data and analytical systems. - Existing scrutiny of maintenance expenditure is constrained by a lack of robust benchmarking information. - A more formal industry consultation process has the potential to alter investment priorities and service levels.	- The benefits of IPR scrutiny of expenditure may be limited because existing processes already provide a level of scrutiny: - Internal state government processes already examine the prudence and efficiency of expenditures, typically as part of budget approval processes. - Infrastructure Australia currently undertakes evaluations on all infrastructure proposals for which funding of more than \$100 million is sought from the Australian Government. - BITRE has begun to publish benchmark data on road construction costs and key cost drivers (BITRE 2018). - Some governments have existing freight industry consultation forums, which partly provide existing formal user input mechanisms.

Revised end-state benefit	Factors that may enable benefits to be realised	Factors that may limit benefit realisation
Benefit 3: Better quality roads, leading to lower vehicle operating costs	A customer service charter may result in some roads receiving a higher level of service than they would otherwise receive.	- The customer service charter applies only to key freight routes and not to all roads. Key freight routes are likely to make up a significant proportion of total kilometres of arterial roads managed by road managers. - Without reforms to road funding involving revenues from road use returning to road managers, the charter may be set at a conservative level that does not result in material gains to road users.
Benefit 4: More efficient pricing, leading to lower vehicle operating costs	A road user charge (RUC) that is set at a higher level to reflect more efficient pricing will not exceed the current fuel excise level⁹.	It is unclear whether there are any limitations.

Valuing the size of the contribution to revised end-state benefits

As illustrated in previous sections, the potential size of the benefits is dependent on the extent to which the reform components in Reform option A or B contribute to lower maintenance and capacity expansion costs, improvements in road quality, and lower overall vehicle operating costs with a higher RUC.

Table 7 illustrates the size of contribution to revised end state benefits that would be required from each of the four benefit components to achieve particular levels of gross benefits for Reform options A or B.

For example, reform benefits are estimated at \$133 million (in present value terms) under Reform option B if it achieves 2% of revised end-state benefits. The 2% benefit could be achieved by the reform delivering all of:

- a 0.17% reduction in overall maintenance costs;
- a 0.14% reduction in capacity expansion costs;
- a 0.01% improvement per annum in road quality; and
- 100% of the benefit of a higher RUC.

The reform benefit falls to \$116 million under Reform option A as the higher RUC reform component is not included under that option.

Our illustration of the potential magnitude of benefits does not include the benefits of price stability in the transport sector or the impacts of better alignment of proposed expenditure with IPR guidelines, as described in Table 3. Those benefits are likely to be much smaller than those shown in Figure 3 and hence have not been included.

⁹ This is based on analysis in the 2014 NTC charging determination.

Table 7: Potential size of benefits

Overall	Contribution to revised end-state benefits				Reform option A (\$ million present value, 2018 dollars)	Reform option B (\$ million present value, 2018 dollars)
	Reduction in maintenance costs	Reduction in capacity expansion costs	Improvement in road quality (p.a.)	% of RUC benefits		
0%	0%	0%	0%	0% Reform option A / 100% Reform option B	\$0	\$17
0.25%	0.022%	0.018%	0.001%		\$15	\$31
0.50%	0.043%	0.035%	0.002%		\$29	\$46
0.75%	0.065%	0.053%	0.003%		\$44	\$60
1.0%	0.09%	0.07%	0.004%		\$58	\$75
1.3%	0.11%	0.09%	0.01%		\$73	\$89
1.5%	0.13%	0.11%	0.01%		\$87	\$104
1.8%	0.15%	0.12%	0.01%		\$102	\$118
2.0%	0.17%	0.14%	0.01%		\$116	\$133
5%	0.43%	0.35%	0.02%		\$291	\$307
10%	0.86%	0.70%	0.04%		\$581	\$598
25%	2.15%	1.75%	0.10%		\$1,453	\$1,470
50%	4.30%	3.50%	0.20%		\$2,906	\$2,923
100%	8.60%	7.00%	0.40%		\$5,812	\$5,829

Source: Marsden Jacob analysis.

Note: Net present value is estimated using a real discount rate of 7%.

5.2 Scenario 2: Further reform

5.2.1 Description of benefits

Under Scenario 2, it is assumed that further reform to achieve the end state is undertaken at a future point in time.

Implementing Reform option A or B should enable full end-state reform to occur earlier than it would if governments decide to delay the implementation either option, thereby stalling heavy vehicle reform for a period of time.

5.2.2 Valuing the benefits of bringing reforms forward

The benefit of avoided delay depends on the number of years of delay. For example, the benefit varies between \$0 and \$800 million if the delay were to be between 0 and 1.5 years (Table 8).

The delay is valued with reference to the total net end-state benefit estimated in DAE (2017): a value of \$13.4 billion, which is an average of options 1, 2 and 3 in that report. The revised end-state gross benefit of \$5.8 billion under scenario 1 is not used for this analysis as it was tailored for use for scenario 1 – for example, it excludes benefits that such as improved vehicle access which are not relevant considerations for Reform option A or B but are relevant for the end-state. Additionally, the \$13.4 billion is a net benefit (benefit less costs) which is what is required for this analysis, while the \$5.8 billion is a gross benefit.

The value of the avoided delay is estimated by deferring the \$13.4 billion gross benefit using a 7% real discount rate. For example, assuming the end-state is achieved in 2025 with implementation of Reform option A or B, a one-year delay after 2025 has a cost of \$546 million in present value terms.

A key issue for this RIS is the extent of delay that may occur without implementation of Reform options A or B. Because the length of potential delay is uncertain, a threshold analysis is undertaken to assess how long the delay has to be for the value of the delay to be greater than the implementation costs. This is explored in more detail in section 7.1.2.

Table 8: Scenario 2—benefits of avoiding delay in achieving end-state reform

Years delay avoided with Reform option A or B	Benefit (\$m)
0	\$0
0.25	\$136
0.5	\$273
0.75	\$409
1	\$546
1.25	\$682
1.5	\$818

Source: Marsden Jacob analysis.

Note: Net present value is estimated using a real discount rate of 7%.

6. Identification and valuation of costs arising from reform

This section estimates the incremental costs of moving to Reform option A or B. This requires an estimate of the costs of retaining the current PAYGO processes (the base case) as well as the costs of each of the reform options under Scenario 1.

When considering cost impacts for the Australian Government, state and territory governments and businesses, costs are separated into ‘set-up’ or ‘establishment’ costs and ongoing costs:

- **Establishment costs** are the costs of transitioning to the new requirements. They comprise capital costs, staff time, management time and consultant fees during the changeover period. Establishment costs are further separated into:
 - costs for establishing new systems and processes; and
 - increased costs that arise the first time the new processes are implemented.
- **Ongoing costs** are annual costs in staff time, management time and consultant fees.

Establishment costs are likely to appear as an increase in costs incurred early in the implementation process (often in Year 1 of the cost–benefit analysis) but may also appear later in the study period as certain aspects of the reform enter into force after a period of time. The costs attributable to reform are those establishment costs that would not have occurred in the absence of reform or otherwise have been brought forward in time as a result of reform.

Ongoing costs appear as the annual cost of compliance from Year 2 onwards (under the reform options). To inform our understanding of ongoing costs attributable to each reform option, we obtained an initial indication from state and territory governments on the likely nature and value of:

- **current costs:** the cost of compliance with the current regulations in terms of staff time, management time and consultant fees per annum; and
- **future costs** (absent the reform): if the base case is retained, are current costs a good estimate of future costs?

Note that the future costs may be the same as the current costs or future projections based on current costs.

Based on the above definitions, we established the initial costs and costs in subsequent years as follows:

$$\text{Initial cost impact of reform} = \boxed{\text{establishment costs}} + \boxed{\text{ongoing costs}} - \boxed{\text{current costs}}$$

$$\text{Ongoing cost impact of reform} = \boxed{\text{ongoing costs}} - \boxed{\text{future costs (absent the reform)}}$$

6.1 Scenario 1: No further reform

As set out in section 4.2, Scenario 1 considers the costs and benefits that would arise from the proposed reforms but assumes that no further reforms are undertaken.

6.1.1 Approach used in identifying and quantifying costs

In considering the costs arising under each of the reform options (including maintaining business as usual), we engaged with each of the state and territory governments as well as the Australian Competition and Consumer Commission (ACCC) and NTC to identify the key cost categories that currently arise or are expected to arise under each of the reform options.

We then also sought input from the NTC and each of the state and territory governments on the expected value of different cost items.

In working with those stakeholders, we found that a few key factors made the estimation of costs more difficult, particularly under the reform options. Those difficulties, and our approach to the estimation, were as follows.

First, no single state or territory was able to quantify the value of every cost both under the current processes and under the reform options. However, among the stakeholders we obtained at least one estimate of the value for each cost item. For this reason, we collated the information provided to generate estimates of the full set of costs.

Second, the scale of operations—such as total area controlled, kilometres of main road, vehicle numbers and total population—varies among the states and territories. As some of the costs appear to be fixed (that is, they would be similar for Tasmania and New South Wales) and others are variable, we interpreted the costs provided and filled in gaps in data to come up with estimated fixed and variable costs.

Finally, and most importantly, the cost estimates for some elements are uncertain and depend on the specifications required. For example, the costs provided by states and territories for the initial development of asset databases and estimations of asset values varied greatly from one jurisdiction to another.

That variation was mostly due to different interpretations of the level of precision required. A couple of states and territories proposed to develop new asset databases and then itemise all road-related assets in the databases, including roadside furniture. A system of this nature was estimated to cost several million dollars per state or territory.

However, following discussions with the ACCC (as a regulator of other utilities), we consider that a reasonable estimation approach involving an expansion of the stereotypes approach¹⁰ already used in many jurisdictions would be appropriate. This proposed approach from the ACCC also aligns with Marsden Jacob's understanding of the approach used in estimating and valuing assets in other regulated utility sectors, such as water, gas pipelines and rail.

¹⁰ Many road managers use a variation of a stereotypes approach. Under this approach, roads are categorised based on factors such as location (urban/rural), traffic characteristics and number of lanes. The typical asset components (and number of each component) per kilometre are then identified – such as road pavement and surface characteristics, roadside assets and so on. The asset characteristics of each stereotype is typically developed using current asset records and/or statistical analysis and sampling of the road assets.

Using this approach, the estimate of current asset numbers and values could be developed based on a sampling approach and would be expected to take a matter of weeks for a small team of staff.¹¹

Therefore, taking into account the divergent views from states and territories on the systems that would be required under the reform options (and the level of precision required for each), the assumed approach for each of the key information types is described in Table 9.

Table 9: Assumed approach to information and system requirements under Reform options A and B

Information type	Assumed approach
Operating and capital expenditure	No significant new systems would be required for states and territories. It is assumed that the regulator would develop an online submission process as part of the initial process and systems development. States and territories would complete expenditure submissions for the FLCB by translating data from their current finance systems. This could either be done manually or through the development of a conversion tool (such as a spreadsheet).
Asset base	No significant new systems would be required for states and territories. States and territories may decide to improve their asset information systems as part of ongoing continual improvement, but those costs are assumed to occur regardless of Reform option A or B going ahead and are not considered to be a prerequisite for implementing either reform option. It is assumed that starting asset values would be estimated using a statistical approach with additional sampling of the road network or by drawing on existing data. For example, road sampling could be undertaken for each road type to determine the average number of assets per unit length for each road type, and that could then be applied to all other roads within the road type category.
Benchmarking system (Reform option B only)	Under Reform option B, it is assumed that the regulator would develop a detailed system that allows benchmarking of data between jurisdictions. This may require some additional data collection by state and territory governments. The cost estimate for this system is based on previous work undertaken by Marsden Jacob on implementing the revised Austroads Data Standard.

More generally, the ACCC indicated that under Reform option A or B the independent regulator would be likely to use a pragmatic approach in requiring common reporting and classification of the FLCB and assets. This would be based on bringing states and territories to a common approach based on the common elements of their current systems, rather than implementing a new framework that would impose significant costs on all states and territories.

6.1.2 Types of costs

Based on preliminary discussions with governments and the NTC, a decision not to undertake further reforms would result in the current PAYGO system being retained. The costs of retaining the PAYGO system for both the NTC and the states and territories are set out in Table 10.

¹¹ It is noted that the value of assets at the start of an FLCB may be less important if the value of the asset base is manipulated to ensure revenue neutrality, – such as in a ‘line in the sand’ approach. This is discussed further in section 4.3.

We note that there may be costs for other stakeholders—such as for peak industry groups in contributing to revenue determination processes—both under the current NTC process and under the proposed reforms. It appears likely that those costs are not substantial, but we would welcome submissions on the likely scale of the costs through the consultation process.

Manual processes are assumed to be used to prepare data and information for the FLCB. We take this approach because, in general, governments are not at this time able to provide information on costs and work effort to develop more automated systems. In time, it could be expected that governments will improve their systems, and that may involve a shift to more automated systems. However, we assume that such a shift would take place only if the benefits of automation outweigh the costs.

Table 10: Costs arising under the base case

Description of outcome	Costs for NTC	Costs for state and territory governments
PAYGO model is retained, maintained and improved over time	Maintenance and continuous improvement of PAYGO	
PAYGO submissions to charging determinations continue in the future	Ongoing assessment costs to undertake charging determinations	Current costs of PAYGO submissions to charging determinations continue into the future
		Costs of state/territory government policy staff currently involved in the charge-setting process

A decision to implement Reform option A would result in the establishment of an IPR and a move to an FLCB. Those reforms would result in both establishment and ongoing costs as set out in Table 11. Those costs have been identified based on preliminary discussions with governments, the NTC and the ACCC.

Table 11: Costs arising under Reform option A

Description of outcome	Costs for regulator	Costs for state and territory governments
Establishment		
Regulator is established.	Establishment costs of new regulator	
Move to an FLCB No new asset / finance systems are built by jurisdictions; work is done manually.	- Staff costs in establishing FLCB^a - Increased cost for first FLCB	- Input on setting FLCB process - Increased cost for first FLCB
Ongoing		
- Revenue submissions made by road managers using templates in NTC draft report on FLCB prototype model (NTC 2017) and making best estimates based on current data. - No new asset / finance systems built by road managers; work is done manually. - No need to move to improved road managers' data systems.	Ongoing staff costs in assessing FLCB and calculating revenue	- Collation of FLCB inputs for both expenditure and assets using a manual system or spreadsheet - Internal auditing of expenditure before submission to regulator

a It is noted that the NTC is continuing to undertake significant work to develop a prototype model of an FLCB for roads, including addressing a number of implementation issues. As a significant amount of that work has been done and will continue to be done while the Phase 2 reforms are being considered, we have considered the costs of that work to be sunk costs that are not affected by the reform options.

A decision to implement Reform option B would result in the establishment of a regulator and a move to an FLCB. Those reforms would result in both establishment and ongoing costs as set out in Table 12. The costs have been identified based on preliminary discussions with governments, the NTC and the ACCC. It can be seen that Reform option B includes all the costs of Reform option A as well as additional costs associated with:

- additional scrutiny of road manager expenditures;
- a move by road managers to improve data information systems;
- a move to new systems to allow the regulator to benchmark assets and expenditure;
- the development of a customer service charter; and
- formalised consulting with an industry expert panel.

Table 12: Costs arising under Reform option B

Description of outcome	Costs for regulator	Costs for state and territory governments
Establishment		
Regulator is established in 2019.	Establishment costs of new regulator	
Move to an FLCB No new asset / finance systems built by jurisdictions; work is done manually.	- Staff costs in establishing FLCB - Increased cost for first FLCB	Input on setting FLCB process and increased cost for first FLCB
Establishing datasets and systems (in alignment with the revised Austroads Data Standard)	Developing a comparative analytical framework and tool to assess efficiencies in expenditure	Modifying information technology systems
Establishing customer service charter		Establishing customer service frameworks and arrangements
Ongoing		
Expenditure submissions made by road managers using templates in NTC draft report on FLCB prototype model (NTC 2017) and making best estimates based on current data.	Staff costs in assessing first FLCB and calculating revenue	- Collation of FLCB inputs for both expenditure and assets - Manual system or spreadsheet (same as Reform option A) - Internal auditing of expenditure before submission to regulator
Additional costs of undertaking scrutiny of expenditure.	- Additional costs in assessing prudence and efficiency of expenditure - Establishment costs - Ongoing costs	- Additional data costs - Establishment costs - Ongoing costs - Regulated entities having a data engagement person
Ongoing: maintaining comparative analysis tool and datasets and systems	Maintaining and operating the comparative analytics tool	Collecting and recording additional data
Customer service charter	Undertaking reviews of road managers' achieved and committed levels of service	Note: Any change in road expenditure required to deliver better quality roads will result in a direct benefit, which forms part of the benefit analysis in section 5.
Formalised consulting with industry expert panel	Fees for experts to attend	

6.1.3 Estimation of costs: key cost assumptions

Key assumptions used to estimate costs under the base case

Based on interviews and data collected from the NTC and states and territories, the key cost assumptions for each of the costs under the base case are set out in Table 13. The timing and frequency of the costs assume that PAYGO determinations will be made on a 5-yearly basis in the future.

For all reform options, average salaries were assumed to be \$100,000, based on advice from some state and territory governments, with an assumed overhead and on-cost rate of 75% of the salary rate. This gives an assumed total annual FTE cost of \$175,000. Table 13 describes each cost and its estimation approach as well as the label and values shown in the base case cost table (Table 17). It should also be noted that all costs and results have been rounded to the nearest \$1,000 to avoid a misperceived level of precision.

Table 13: Key cost assumptions under the base case

Description of outcome	Costs for NTC	Costs for state and territory governments	Timing and frequency of costs
PAYGO submissions to charging determinations continue in the future	NTC ongoing assessment costs: 4–5 FTEs are needed for approximately 18 months to prepare and finalise a charging determination. [PAYGO assessment charging determination: \$1,181,000]	Current costs of providing NTC with historical expenditure in NTC template. Based on responses from states and territories, estimated to be a total of 127 FTE days for each charging determination (or an average of 16 days per state or territory government). [Current NTC process (expenditure): \$101,000]	2020 onwards as a cost every year
		- State/territory government policy staff currently involved in charge-setting process. - Note: We assume this to be \$0, as these staff times are likely to be small and are likely to be reassigned to other elements of the reformed processes under reform options A and B. [Not shown in table]	Not applicable

Description of outcome	Costs for NTC	Costs for state and territory governments	Timing and frequency of costs
PAYGO model is retained, maintained and improved over time	- Maintenance and continuous improvement of PAYGO. Assume around \$50,000 is spent each year between charging determinations on external consultant research to support a methodology review. [Consultants: annual review: \$50,000] 1 FTE each year to undertake maintenance and monitoring activities (such as annual adjustments) between determinations. [Maintenance and monitoring: \$175,000]		2020 onwards as a yearly cost
	A formal methodology review of the NTC charging model (e.g. cost allocators, other assumptions, calculation approach) is undertaken; estimated to require 2 NTC FTEs over a 12-month period. [Enhancement cost—formal methodology review every 5 years: \$350,000]		2019 onwards as a cost every 5 years

Source: Discussions with NTC, information from state and territory governments and Marsden Jacob analysis.

Key assumptions used to estimate costs under Reform option A

Based on interviews and data collected from the ACCC and state and territory governments, the key assumptions used to estimate the costs under Reform option A are set out in Table 14.

Table 14 describes the cost and its estimation approach as well as the label and values shown in the Option A cost table (Table 18). It should also be noted that all costs and results have been rounded to the nearest \$1,000 to avoid a misperceived level of precision.

The ongoing cost estimates assume that FLCB submissions are made based on an amended version of the NTC prototype report (NTC 2017) and that governments make their best estimates of values based on available data.

A key point of discussion with states and territories has been the level of rigour that would be needed in data that would be provided by governments. Based on our research on processes used for other regulated utilities, our current assessment is that suitable expenditure and asset information and values¹² can be derived or estimated from data held by the state and territory governments in their existing information systems.

Where road managers are required to provide information on asset values that are not currently valued, it is likely that the IPR would approve a suitable estimation method in order to ensure a consistent approach among states and territories over time.

The timing and frequency of the costs assume that FLCB submissions and determinations will be made on a 2-yearly basis. It may be appropriate to extend the period to 4 years under Scenario 2. We note that feedback from state and territory governments has indicated that extending the period to 4 years would ideally need to be associated with some form of road funding reform.

Table 14: Key cost assumptions under Reform option A

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
Establishment			
Establishing regulator	Establishment costs of new regulator: based on what was involved in moving regulatory information notices from the Essential Services Commission to the Australian Energy Regulator, the work effort in establishing the new regulator is estimated to be 15 FTEs for 1 year. [Establishing a regulator: \$2,625,000]		2019 One-off establishment cost
Move to an FLCB			
Establishing an FLCB	Staff costs in establishing an FLCB: based on what was involved in moving regulatory information notices from the Essential Services Commission to the Australian Energy Regulator, the work effort in establishing the new regulator is estimated to be 5 FTEs over 18 months. This work involves setting up the framework, templates etc. [Establishing an FLCB framework: \$1,313,000]	Input on setting the FLCB framework process: estimated for 8 jurisdictions at 1 day per week (0.2 FTEs) each for 18 months [Establishing FLCB: \$420,000]	2019 One-off establishment cost

¹² That align with the categories proposed in the NTC FLCB prototype.

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
Increased cost for first FLCB	Estimate based on current ongoing costs, which are based on NTC costs of 4–5 FTEs for 18 months in assessment years. [Increased cost for first FLCB: \$1,181,000]	- Estimate based on state and territory government estimated times for NTC prototype process. Initial elements include: - developing the process to convert existing asset and expenditure information into the new template (from current information systems into the new categories); - reviewing the data to ensure that it is correctly specified and translated; and - documenting the conversion process. - Estimated at a total (aggregate across all jurisdictions) of 152 days for expenditure and 141 days for asset valuation, based on state and territory governments' times for NTC prototype process. [First FLCB—expenditure: \$121,000 First FLCB—asset valuation: \$173,000]	2020 One-off establishment cost
No new asset and expenditure/finance systems built by jurisdictions; work is done manually; no need to change data model		No new systems and no additional time beyond step indicated above. It is noted that a conversion tool may be developed if that is more efficient than a manual approach.	Not applicable
Initial (baseline) estimation of assets based on sampling approach		Initial assets estimated using on-ground sampling and applying it to the network using a stereotype approach. It is assumed this would cost around \$200,000 per jurisdiction [Baseline asset sampling: \$1,600,000]	2020 One-off establishment cost

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
Ongoing			
Ongoing revenue submissions	Ongoing staff costs in assessing the FLCB and calculating revenue. Estimate based on current NTC costs for PAYGO: 4–5 FTEs for 18 months in assessment years. This was also similar to ACCC estimates based on the Electricity Networks Branch of the Australian Energy Regulator. [Determination of FLCB: \$1,181,000]	- Collation of FLCB inputs using a manual system or spreadsheet. - Consolidated response based on state and territory governments' estimated work effort to deliver to NTC's FLCB prototype asset and expenditure templates. Estimated at a total (aggregate across all jurisdictions) of 152 days for expenditure and 141 days for asset valuation. [Ongoing: additional work for FLCB—expenditure: \$121,000] [Ongoing: additional work for FLCB—assets: \$125,000] - Ongoing audit cost based on assumed \$50,000 per jurisdiction per submission. [Ongoing audit cost: \$400,000]	Ongoing 2020 and every 2 years

Sources: State and territory governments, ACCC and Marsden Jacob analysis.

Key assumptions used to estimate costs under Reform option B

Under Reform option B, all of the costs identified in Table 14 are relevant. In addition, the costs set out in Table 15 would also apply. Table 15 describes the cost and its estimation approach as well as the label and values shown in the Option B cost tables (Table 19 and Table 20). It should also be noted that all costs and results have been rounded to the nearest \$1,000 to avoid a misperceived level of precision.

Table 15: Additional costs arising under Reform option B

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
Establishment			
Additional costs for scrutiny of expenditure	ACCC estimate was 8 FTEs for 18 months, based on Australian Energy Regulator (AER) benchmarking. [Establishing new regulator: \$2,625,000]	Estimated for 8 state and territory governments at 1 day per week (0.2 FTEs) each for 18 months. [Staff costs in establishing FLCB: \$420,000]	2019 - One-off establishment cost

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
New expenditure benchmarking information (and supporting) systems built 2021–2022	These estimates are for establishment costs for the regulator: total of \$25.2 million over 5 years. [Establishing data standard and systems: Further refinement of standard: starts at \$66,667 Governance and supporting systems: \$1,000,000 Knowledge and analytics platform: starts at \$5,417,000]	Establishment costs to modify IT systems: total of \$13.8 million over 5 years. [Establishing data standard and systems: starts at \$752,000]	2021, 2025 One-off establishment cost
Customer service charter		Establishment cost based on 0.25 FTE per state and territory. [Customer charter establishment: \$350,000]	2019 One-off establishment cost
Ongoing			
Maintaining and operating systems	Comparative analytics benchmarking tool: ongoing increases to \$5 million per year. [Knowledge & analytics platform, ongoing: starts at \$1,667,000]	Operating costs to collect additional data: increases to \$1.17 million per year. [Collecting additional data: starts at \$100,000]	Ongoing costs, every year

Description of outcome	Costs for regulator	Costs for state and territory governments	Timing and frequency of costs
Ongoing resources to allow additional scrutiny	ACCC estimate was 20% of AER Networks Branch (total budget of which is \$6–7 million). [Ongoing assessment cost: increased scrutiny: \$1,300,000]	Assumed to be 0.5 FTEs per state and territory government. [Ongoing resources to allow additional scrutiny: \$1,400,000]	Ongoing costs, every 2 years
Customer service charter	Undertaking reviews of road managers' achieved and committed levels of service, based on 1 week of FTE time per state or territory. [Customer service charter:- \$32,000]	Any additional maintenance and capital expenditure to improve road quality is included in the benefits component of the cost–benefit analysis. [Customer service charter, ongoing cost: \$350,000]	Ongoing costs, every year
Formal consulting with industry (expert panel)	Assumed to be 8 members at \$5,000 per member for their time. [Expert panel members' time: \$40,000]		Ongoing costs, every 2 years

Sources: State and territory governments, ACCC and Marsden Jacob analysis.

6.1.4 Summary of costs

The present value of the costs for each of the options is set out in Table 16. The analysis used an assumed time frame of 20 years and a real discount rate of 7%.

Table 16: Present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$5.89	\$0.00	\$0.00
IPR	\$0.00	\$10.76	\$67.56
State and territory governments	\$1.07	\$5.35	\$31.40
Total	\$6.96	\$16.11	\$98.97
Incremental cost (compared to base case)		\$9.15	\$92.00

6.1.5 Detailed costs

Using the assumptions set out in the previous sections, the cost flows for the base case and reform options for the analysis period, as well as the present value of the costs (at a real discount rate of 7% and over a time frame of 20 years), are set out in:

- Table 17: Base case—cost flows
- Table 18: Option A—cost flows
- Table 19: Option B—regulator cost flows
- Table 20: Option B—state and territory government cost flows

To allow for space constraints, each table shows the cost flows for years 1 to 9 as well as year 20. In addition, the present values of the costs are shown over the full 20-year period.

Note that the costs in this section do not include the additional costs associated with improving road quality, as those costs are incorporated into the net benefits of improving road quality in section 5.

Table 17: Base case—cost flows for years 1–9 and year 20

Cost calculations	PV	2019 1	2020 2	2021 3	2022 4	2023 5	2024 6	2025 7	2026 8	2027 9	↔ ↔	2038 20
NTC												
<u>Ongoing normal PAYGO cost</u>												
PAYGO assessment charging determination			\$1,181,000					\$1,181,000				
Maintenance and monitoring		\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000		\$175,000
<u>Methodology review</u>												
Consultants: annual review		\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000		\$50,000
Enhancement cost—formal methodology review every 5 years		\$350,000					\$350,000					
NTC total cost	\$5,894,000	\$575,000	\$1,406,000	\$225,000	\$225,000	\$225,000	\$575,000	\$1,406,000	\$225,000	\$225,000	↔	\$225,000
State and territory governments												
Ongoing cost												
<u>Ongoing normal PAYGO cost</u>												
Current NTC process (expenditure)		\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000		\$101,000
State & territory total cost	\$1,070,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	\$101,000	↔	\$101,000

Note: Present value is for the full 20 years. All costs are provided in 2018 values.

Table 18: Option A—cost flows for years 1–9 and year 20

Cost calculations	PV	2019 1	2020 2	2021 3	2022 4	2023 5	2024 6	2025 7	2026 8	2027 9	↔ ↔	2038 20
Regulator												
<u>Establishing new regulator</u>												
Establishing a regulator		\$2,625,000										
<u>Establishing FLCB</u>												
Establishing FLCB framework		\$1,313,000										
<u>Increased cost for first FLCB</u>												
Increased cost for first FLCB			\$1,181,000									
Ongoing cost												
Determination of FLCB			\$1,181,000		\$1,181,000		\$1,181,000		\$1,181,000			\$1,181,000
Total cost	\$10,756,000	\$3,938,000	\$2,362,000	\$0	\$1,181,000	\$0	\$1,181,000	\$0	\$1,181,000	\$0	↔	\$1,181,000
State and territory governments												
<u>Establishing FLCB</u>												
Establishing FLCB		\$420,000										
<u>Increased cost for first FLCB</u>												
First FLCB: expenditure			\$121,000									
First FLCB: asset valuation			\$173,000									
Baseline asset sampling			\$1,600,000									
<u>Ongoing</u>												
Ongoing: additional work for FLCB—expenditure			\$121,000		\$121,000		\$121,000		\$121,000			\$121,000
Ongoing: additional work for FLCB—assets			\$125,000		\$125,000		\$125,000		\$125,000			\$125,000
Ongoing audit cost			\$400,000		\$400,000		\$400,000		\$400,000			\$400,000
State & territory total cost	\$5,353,000	\$420,000	\$2,540,000	\$0	\$646,000	\$0	\$646,000	\$0	\$646,000	\$0	↔	\$646,000

Note: Present value is for the full 20 years.

Table 19: Option B—regulator cost flows for years 1–9 and year 20

Cost calculations	PV	2019 1	2020 2	2021 3	2022 4	2023 5	2024 6	2025 7	2026 8	2027 9	↔ ↔	2038 20
Regulator												
Establishing new regulator		\$2,625,000										
Establishing FLCB		\$1,313,000										
<u>Establishing data standard and systems</u>												
Further refinement of standard				\$66,667	\$66,667	\$1,066,667	\$1,000,000	\$1,000,000				
Governance and supporting systems				\$1,000,000	\$1,000,000	\$1,000,000						
Knowledge and analytics platform				\$5,417,000	\$5,417,000	\$6,354,000	\$938,000	\$938,000				
<u>Increased cost for first FLCB</u>												
First FLCB			\$1,181,000									
Increased scrutiny			\$2,100,000									
<u>Ongoing assessment</u>												
Ongoing assessment			\$1,181,000		\$1,181,000		\$1,181,000		\$1,181,000			\$1,181,000
Ongoing assessment cost: increased scrutiny			\$1,300,000		\$1,300,000		\$1,300,000		\$1,300,000			\$1,300,000
Customer service charter			\$32,000		\$32,000		\$32,000		\$32,000			\$32,000
Expert panel members' time			\$40,000		\$40,000		\$40,000		\$40,000			\$40,000
Knowledge & analytics platform—ongoing				\$0	\$0	\$0	\$1,666,667	\$3,333,333	\$5,000,000	\$5,000,000		\$5,000,000
Total cost	\$67,564,000	\$3,938,000	\$5,834,000	\$6,484,000	\$9,037,000	\$8,421,000	\$6,158,000	\$5,271,000	\$7,553,000	\$5,000,000	↔	\$7,553,000

Note: Present value is for the full 20 years.

Table 20: Option B—state and territory government cost flows for years 1–9 and year 20

Cost calculations	PV	2019	2020	2021	2022	2023	2024	2025	2026	2027	↔	2038
		1	2	3	4	5	6	7	8	9	↔	20
State and territory governments												
Staff costs in establishing FLCB		\$420,000										
Increased scrutiny and data cost		\$420,000										
First FLCB			\$121,000									
Asset valuation			\$173,000									
Baseline asset sampling			\$1,600,000									
Establishing data standard and systems				\$752,000	\$752,000	\$4,602,000	\$3,850,000	\$3,850,000				
Customer charter establishment		\$350,000										
Ongoing: additional work for FLCB—expenditure			\$121,000		\$121,000		\$121,000		\$121,000			\$121,000
Ongoing: additional work for FLCB—assets			\$125,000		\$125,000		\$125,000		\$125,000			\$125,000
Ongoing audit cost			\$400,000		\$400,000		\$400,000		\$400,000			\$400,000
Ongoing resources to allow additional scrutiny			\$1,400,000		\$1,400,000		\$1,400,000		\$1,400,000			\$1,400,000
Customer service charter—ongoing cost			\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000		\$350,000
Collecting additional data				\$0	\$0	\$0	\$100,000	\$201,000	\$476,000	\$650,000		\$1,174,000
State & territory total cost	\$31,401,000	\$1,190,000	\$4,290,000	\$1,102,000	\$3,148,000	\$4,952,000	\$6,346,000	\$4,401,000	\$2,872,000	\$1,000,000	↔	\$3,570,000

Note: Present value is for the full 20 years.

6.2 Scenario 2: Further reform is undertaken

The benefits listed in section 5.2 are net benefits and so have already had the additional costs of further reform subtracted. For that reason, no further discussion of costs under Scenario 2 is provided here.

7. Impact analysis results

7.1 Assessment of costs and benefits

7.1.1 Scenario 1: No further reform

Net benefits and threshold analysis

Assuming that there is no further reform under Scenario 1, the net benefits of Reform options A and B are examined in this section with reference to a threshold analysis. The threshold analysis calculates the minimum benefit that would need to be achieved for the net benefits to be greater than zero (that is, for the benefits to be greater than the costs). The minimum benefit is estimated with reference to the estimated incremental costs.

The threshold analysis is applied because it is difficult to quantify the value of the key benefits, taking into account the nature of the reforms.

In particular, while it is possible to define and value the potential end-state benefits associated with a more comprehensive HVRR agenda (as per Table 5 in section 5.1.2), it is much more challenging to define the contribution of Reform options A or B to the end-state benefits.

This is because of the nature of the reform (i.e. it is a reform involving a new regulatory framework) and that it is very challenging to estimate the extent that road managers will be incentivised to improve the efficiency of their investments in response to the type of reforms under Reform options A and B.

Moreover, previous estimations of the benefits of heavy vehicle reform assumed the full end-state. However, Reform options A and B are a transitional step toward the full end-state and it is challenging to estimate their contribution to end-state benefits as some key reform components, which are integral to quantifying the end state, are not part of Reform options A or B, including:

- a more comprehensive form of economic regulation that includes the ability of the IPR to disallow expenditure that it does not regard as efficient or prudent; and
- reforms that involve revenue from roads being returned to road owners.

As a result, the threshold test is whether it is reasonable to believe that benefits will be greater than the incremental costs, taking into consideration the type of potential benefits identified in section 5.1.1 and how they may contribute, even partially, to the end-state benefits.

The incremental costs of the reforms are estimated to be in the order of \$9 million for Reform option A and \$92 million for Reform option B in present value terms and using a 7% real discount rate (Table 16).

Therefore, for the net benefits to be greater than zero (that is, to have a present value that is positive and a benefit–cost ratio greater than or equal to 1), the gross incremental benefits need to be higher than \$9 million for Reform option A and \$92 million for Reform option B.

Drawing on the benefits analysis in Table 7 in section 5, the net benefits are greater than zero if the reforms deliver a contribution to the relevant end-state benefits of:

- 0.16% for Reform option A; and
- 1.3% for Reform option B.

Table 21: Required contribution to end-state benefits

Required contribution to revised end state benefits (% of total)					
Reform	Overall	Reduction in maintenance costs	Reduction in capacity expansion costs	Improvement in road quality (p.a.)	% of RUC benefits
Reform option A	0.16%	0.014%	0.011%	0.001%	0%
Reform option B	1.30%	0.11%	0.09%	0.01%	100%
Revised end state	100.00%	8.60%	7.00%	0.40%	100%

Source: Marsden Jacob analysis.

Note: Net present value is estimated using a real discount rate of 7%.

In practical terms, this means that systemic improvements from implementing Reform option A or B would only have to be a portion of the total end-state benefits.

As illustrated in Table 21, the benefits are greater than the costs under Reform option A if it results in all of:

- maintenance expenditure savings of 0.014% of total maintenance expenditure, compared to the 8.6% potential saving under end-state reform;
- improvements in the efficiency of capital expenditure by 0.011%, compared to the 7% potential saving under end-state reform; and
- improvement in the quality of roads, as measured by the International Roughness Index, of 0.001% per annum, compared to the 0.4% reduction under end-state reform.

In addition, as illustrated in Table 21, the benefits are greater than the costs under Reform option B if it results in all of:

- maintenance expenditure savings of 0.11% of total maintenance expenditure, compared to the 8.6% potential saving under end-state reform;
- improvements in the efficiency of capital expenditure by 0.09%, compared to the 7% potential saving under end-state reform;
- improvement in the quality of roads, as measured by the International Roughness Index, of 0.01%, compared to the 0.4% reduction under end-state reform; and
- improvements in vehicle operating costs due to movement towards an efficient mix of registration and RUC-based pricing.

7.1.2 Scenario 2: Further reform is undertaken

Assuming that further reform is undertaken under Scenario 2, the net benefits of Reform options A and B are examined here with reference to a threshold analysis because of challenges in estimating the gross benefits.

Drawing on the benefits analysis in section 5, the net benefits are greater than zero for Reform option A if undertaking the reform avoids a delay in achieving the end-state reform of 0.02 years (or 6 days) (Table 22). In addition, the net benefits are greater than zero for Reform option

B if undertaking the reform avoids a delay in achieving the end-state reform of 0.17 years (62 days).

Table 22: Benefit of avoiding delay in achieving end-state reform

Reform option	Delay required for net benefits to be greater than zero	
	Years	Days
Reform option A	0.02	6
Reform option B	0.17	62

Source: Marsden Jacob analysis.

Note: Net present value is estimated using a real discount rate of 7%.

7.1.3 Sensitivity analysis

Discount rates

In line with guidance on cost–benefit analysis (DoF 2006; PM&C 2014, 2016), the net present value of the costs is estimated over a 20-year period using discount rates of 3% and 10%, as well as the central case of 7%.

These results are set out in Table 23, Table 24 and Table 25. It can be seen that because the discount rate affects the base case as well as each reform option the impact of altering the discount rate is reasonably small.

Table 23: 7% discount rate—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$5.89	\$0.00	\$0.00
IPR	\$0.00	\$10.76	\$67.56
State and territory governments	\$1.07	\$5.35	\$31.40
Total	\$6.96	\$16.11	\$98.97
Increment over base case		\$9.15	\$92.00

Table 24: 3% discount rate—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$8.07	\$0.00	\$0.00
IPR	\$0.00	\$13.59	\$95.13
State and territory governments	\$1.50	\$6.93	\$43.54
Total	\$9.57	\$20.52	\$138.67
Increment over base case		\$10.95	\$129.10

Table 25: 10% discount rate—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$4.82	\$0.00	\$0.00
IPR	\$0.00	\$9.34	\$54.14
State and territory governments	\$0.86	\$4.57	\$25.38
Total	\$5.68	\$13.91	\$79.52
Increment over base case		\$8.23	\$73.84

Cost estimates

It is recognised that the cost–benefit analysis uses cost estimates that are reasonably uncertain and so may have wide error margins. For this reason, we considered what would occur if all costs were increased by 25% or decreased by 25%. The results are set out in Table 26, Table 27 and Table 28. It can be seen that for Reform option A the increment over the base case varies between \$5 million and \$13 million. For Reform option B, it varies between \$67 million and \$116 million.

The higher cost estimate of \$13 million for Option A and \$164 million for Option B does not materially change our conclusions in section 7.1.1.

Table 26: Central cost estimate (100%)—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$5.89	\$0.00	\$0.00
IPR	\$0.00	\$10.76	\$67.56
State and territory governments	\$1.07	\$5.35	\$31.40
Total	\$6.96	\$16.11	\$98.97
Increment over base case		\$9.15	\$92.00

Table 27: Low cost estimate (75%)—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$5.89	\$0.00	\$0.00
IPR	\$0.00	\$8.07	\$50.67
State and territory governments	\$1.07	\$4.02	\$23.56
Total	\$6.96	\$12.09	\$74.23
Increment over base case		\$5.12	\$67.27

Table 28: High cost estimate (125%)—present value of the costs (\$ million)

	Base case	Reform option A	Reform option B
NTC	\$5.89	\$0.00	\$0.00
IPR	\$0.00	\$13.45	\$84.46
State and territory governments	\$1.07	\$6.69	\$39.25
Total	\$6.96	\$20.14	\$123.71
Increment over base case		\$13.17	\$116.75

7.2 Regulatory burden measurement

Our regulatory burden measurement followed the framework set out in the Australian Government's guidance (PM&C 2017). That approach classifies all industry costs as either administrative compliance costs, substantive compliance costs or delay costs. Our interpretation of this approach is set out in detail in section 4.3 of this RIS.

The regulatory burden values are provided here as a simple average of costs to industry over the first 10-year period after reform and are disaggregated by cost type. However, the nature of the proposed reforms means that no regulatory burden is expected to arise under Reform option A or B. This result is set out in the required format in Table 29.

As noted in section 4.3 we would welcome stakeholder input on costs arising from the reform.

Table 29: Regulatory burden estimate

Average annual regulatory costs (from business as usual)				
Change in costs (\$ million)	Business	Community organisations	Individuals	Total change in costs
Total, by sector: Reform option A	\$0	\$0	\$0	\$0
Total, by sector: Reform option B	\$0	\$0	\$0	\$0

7.3 Risk analysis

Beyond risks of cost increases, which are addressed in the sensitivity analysis above, no significant risks were identified in initial discussions with jurisdictions.

We would welcome input on both the likelihood and severity of risks that may arise (or be reduced) under Reform option A or Reform option B compared to the base case.

7.4 Competition effects

A key consideration about any proposed reform is whether the reform would have an adverse impact on competition. Competition impacts could arise if the reform imposes on one or more markets increased barriers to entry or exit, disproportionate buyer or supplier power, or information asymmetries.

Due to the nature of the reforms proposed in this RIS, we do not consider that adverse competition impacts would arise under any of the reform options.

7.5 Other impacts considered

The relevant guidance (COAG 2007) requires that a range of other possible impacts be considered when conducting impact analyses, such as:

- consistency with Australia's international obligations and relevant internationally accepted standards and practices
- potential incentive effects and secondary effects
- compliance and enforcement issues.

However, as the proposed reforms relate to amending regulatory frameworks, the reform options appear to have few if any impacts that have not been identified and considered in the previous sections.

8. Evaluation and conclusion

8.1 Preliminary evaluation of options

This Consultation RIS sets out our preliminary evaluation of the reform options and the resulting recommendation.

8.1.1 Evaluation of the options against the broader reform program

As set out in section 5, Reform options A and B have the potential to go some way towards achieving end-state reform for heavy vehicle charging and investment.

Reform option B implements a model that is closer to the end-state reform than does Reform option A. Some key components of Reform option B that are not in Reform option A are:

- some additional scrutiny of capacity and maintenance expenditure by the IPR;
- a customer service charter for key freight routes;
- more formal industry consultation mechanisms; and
- the ability for the IPR to adjust the mix of RUC and registration charges in contributing to revenues from heavy vehicle charges.

However, compared to broader reform of heavy vehicle charging and investment arrangements, some key reform components associated with achieving the end state are not part of Reform options A or B, including:

- a more comprehensive form of economic regulation that includes the ability of the IPR to disallow expenditure that it does not regard as efficient or prudent; and
- reforms that involve revenue from roads being returned to road owners.

The exclusion of these key components has made valuing the benefits challenging and led to the use of a threshold approach in the cost–benefit analysis.

8.1.2 Evaluation of the options against impact assessment

Cost–benefit analysis

A key element of the impact assessment is the cost–benefit analysis.

As set out in section 7.1, the cost–benefit analysis compared Reform option A and Reform option B against a base case. Each of the reform options is considered under two scenarios:

- Scenario 1: No further reform is undertaken; and
- Scenario 2: Further reforms are undertaken.

Under **Scenario 1**, it appears that a small proportion of the benefits of relevant end-state reform components are required to cover the estimated incremental costs of moving to Reform option A or B—in particular, around 0.16% of the relevant end-state benefits for Reform option A and around 1.3% of the relevant end-state benefits for Reform option B.

However, as discussed in section 5.1.2, the key threshold question is ‘What proportions of the revised end-state benefits are likely to be achieved under Reform options A and B?’

This RIS describes a number of benefits that are likely to arise from Reform options A and B and how they are linked to contributing to end-state benefits. In doing this, the RIS illustrates the key questions to ask when assessing the potential contributions of the two reform options to the revised end-state benefit. In particular, the key questions can be expressed in relation to four key benefit drivers:

- What proportion of the 8.6% *lower maintenance costs* estimated under the end state is likely under each reform option through more optimal lifecycle maintenance decisions and increased efficiency from better governance through forward-looking pricing and economic regulation costs?
- What proportion of the 7% *lower capacity expansion costs* estimated under the end state is likely under each reform option through increased efficiency from better governance via forward-looking pricing and economic regulation costs?
- What proportion of the 0.4% per annum *improvement in road quality* estimated under the end state is likely under the reform options from better quality roads (for example, from implementing a customer service charter or more formal industry consultation mechanisms)?
- Is the estimated benefit of a higher RUC (at 72% of total charging revenue compared the current 60% share) of \$17 million in present value (2018 dollar) terms achievable, taking into account the potential for more efficient pricing to lead to lower vehicle operating costs?

To assist in answering these questions, it is useful to consider a number of key factors that may either enable benefits to be realised or limit them. These factors assist in determining the size of the contribution. For example, how much will Reform option A or B contribute to the 8.6% lower maintenance cost under the revised end-state reform? A summary of these factors is in Table 30.

Table 30: Factors to consider when assessing the size of benefits

Revised end-state benefit	Enabling factors	Limiting factors
Benefit 1: More optimal lifecycle maintenance decisions	▪ An FLCB encourages greater focus on customer needs and efficient investment over longer term, while encouraging improvements to asset management systems. ▪ Additional scrutiny of maintenance expenditure may encourage lower maintenance costs (see benefit 2).	▪ An FLCB that involves only a 1- or 2-year forecast may not result in much change, as state governments already largely plan at this level. ▪ Without reforms to road funding, it is challenging to implement a more optimal lifecycle maintenance plan.

Revised end-state benefit	Enabling factors	Limiting factors
Benefit 2: Increased efficiency from better governance through forward-looking pricing and independent price and/or economic regulation	- By publicly highlighting areas where road managers may be able to reduce costs or improve the efficiency of their investments, the IPR has the potential to place a level of public scrutiny on expenditure proposals (and past expenditure) that does not currently exist. - Scrutiny will be assisted by comparative benchmarking of expenditure across states and territories, which will be supported by new data and analytical systems. - Existing scrutiny of maintenance expenditure is constrained by a lack of robust benchmarking information. - A more formal industry consultation process has the potential to alter investment priorities and service levels.	- The benefits of IPR scrutiny of expenditure may be limited because the following existing processes already provide a level of scrutiny: - internal state government budget processes - Infrastructure Australia's evaluation processes for expenditure submissions - BITRE benchmarking of road construction costs and key cost drivers (BITRE 2018). - Some governments have existing freight industry consultation forums, which partly provide existing formal user input mechanisms.
Benefit 3: Better quality roads, leading to lower vehicle operating costs	A customer service charter may result in some roads receiving a higher level of service than they would otherwise receive.	- The customer service charter applies only to key freight routes, although those roads make up a significant proportion of arterial roads. - Without reforms to road funding, committed service levels may be set conservatively.
Benefit 4: More efficient pricing, leading to lower vehicle operating costs	A road user charge (RUC) that is set at a higher level to reflect more efficient pricing will not exceed the current fuel excise level¹³.	It is unclear whether there are any limitations.

Scenario 2 provides a more definitive result in which benefits are likely to be greater than costs under both reform options. This is because there is likely to be a delay in moving towards end-state reform if Reform options A and B are rejected, and it does not need to be a very long delay for the benefits to be greater than the costs. A delay of only 2 months may be more than sufficient to justify moving ahead with either reform option.

However, it is important to note that Scenario 2 assumes further reform towards the end-state reform.

¹³ This is based on analysis in the 2014 NTC charging determination.

Other impacts

In our preliminary assessment, we considered both reform options under both scenarios against a range of other potential impacts:

- regulatory burden;
- risk analysis;
- competition effects;
- consistency with Australia's international obligations and relevant internationally accepted standards and practices;
- potential incentive effects and secondary effects; and
- compliance and enforcement issues.

Marsden Jacob's preliminary assessment is that neither of the reform options would trigger significant impacts under any of these tests. For this reason, these elements of the impact assessment are unlikely to alter the assessment of the preferred option.

8.2 Preliminary recommendation

Based on the preliminary evaluation of the options under Scenario 1, Reform options A and B should be recommended if it is considered likely that benefits flowing from the reform option outweighs the costs. As the costs have been estimated, a threshold analysis has been used to identify the point at which benefits would be greater than the costs.

That threshold has been identified as being met if Option A delivers more than 0.16% of the estimated end-state benefits and if Option B delivers more than 1.3% of the estimated end-state benefits.

While these thresholds appear low, we would welcome input from stakeholders on whether they consider that benefits are likely to be sufficient to outweigh the costs, taking into account the nature of the benefits described in the RIS and summarised in Figure ES1.

We have noted that under Scenario 2 (further reform) any delay in implementing full reform is valued at \$546 million per year (see Table 22). As a rejection of both reform options would be likely to stall further HVRR for an extended period (possibly 3–6 years or more), a decision to reject both reforms would result in a lost opportunity valued at around \$2–\$3 billion.

9. Implementation and review

9.1 Implementation of reforms

If the TIC chooses to implement either Reform option A or Reform option B in 2018–19, the possible timing of subsequent steps would be as follows:

- In 2019, agree on detailed policy settings for the IPR, including pricing principles and a transition pathway to full economic regulation.
- In 2019 and 2020, agree on detailed policy settings for the FLCB.
- In 2020, establish the IPR.

Each of these subsequent steps would involve stakeholder consultation before decisions could be taken.

9.2 Review

It is proposed that the operation of the IPR and FLCB be reviewed every 5 years after the implementation of the proposed reforms.

The review would consider whether:

- the use of an IPR and FLCB remain appropriate for setting heavy vehicle pricing; and
- the arrangements are effective (that is, achieve the reform objectives) and are efficient (that is, deliver the objectives on a low-cost basis).

10. Consultation and next steps

10.1 Your input is requested

Marsden Jacob is seeking stakeholder views and responses on the advantages and disadvantages of the proposed heavy vehicle road reforms.

The objective of this consultation process is to consult stakeholders to:

- clarify the implications of the current PAYGO system, including any inefficiencies in heavy vehicle road service delivery driven by the current pricing; and mechanism
- better understand the implications of options and scenarios for independent price regulation.

Following the consultation process, a Decision RIS will be produced, providing final recommendations to the TIC on the proposed reforms.

This Consultation RIS includes a preliminary impact assessment. However, it is possible that you may identify other potential concerns, benefits or costs that we have not considered.

In providing a response, you are invited to either:

- answer ‘guide questions’, which are provided in Appendix 3 of this RIS
- or
- provide general comments on the proposed regulations and the content of this RIS.

If you choose not to answer the suggested questions, you should focus your comments on comparing the advantages and disadvantages of the proposed reform options.

10.1.1 Stakeholder forum

To allow you to provide comments in person and ask questions of the consultants, a **stakeholder forum will be held on 8th August 2018**. The forum will be held in Canberra from 8.45 am until 12 noon.

In addition, a **webinar will be held on 9th August 2018**.

To register your interest in attending either event, please email your name, the event you are interested in, the name of your organisation and your contact phone number to hvrr@marsdenjacob.com.au. The details for each event will be provided to respondents who express an interest.

10.1.2 Cover sheet and consultation questions

We ask you to attach a completed copy of the cover sheet in Appendix 3 of this RIS to your submission. The cover sheet and consultation questions are available in Microsoft Word format for download:

- **Cover sheet and consultation questions.**

Please provide written feedback on the proposed options by 5 pm WST, 6.30 pm CST, 7.00 pm EST on **Friday 31 August 2018**.

Submission address:

HVRR Consultation
C/ Marsden Jacob Analysis
Level 4, 683 Burke Rd,
Camberwell VIC 3124

By email to: hvrr@marsdenjacob.com.au

10.1.3 Conditions of submission and confirmation of receipt

When we receive your submission, you will be sent a confirmation receipt.

All submissions will in time be made available to the public on the RIS consultation web page website (<http://www.marsdenjacob.com.au/hvrr-phase-2/>). If you do not wish your submission to be made public, please clearly mark it 'CONFIDENTIAL'. Your receipt will note your preference.

All comments received by 5.00 pm WST, 6.30 pm CST, 7.00 pm EST on Friday 31 August 2018 will be considered.

10.2 Consideration of responses

Marsden Jacob will assess the consultation responses against the RIS criteria and provide independent advice to the TIC in drafting the Decision RIS. We encourage those making submissions to address the consultation questions directly where possible. The questions are designed to assist in the estimation of likely benefits and costs to stakeholders as a result of the proposed changes.

10.3 Next steps

Marsden Jacob Associates will compile and analyse all responses that are received.

Following the analysis of submissions, a Decision RIS will be prepared, setting out the recommended approach. The Decision RIS is expected to be completed by October 2018.

10.4 Enquiries

All enquiries about this consultation process should be addressed to:

Alex Marsden
Associate Director
Marsden Jacob Associates
(08) 9324 1785
hvrr@marsdenjacob.com.au

Appendix 1: Detailed explanation of reform elements

Network coverage

Overview

The network coverage sets out the scope of the proposed reforms, specifying the types of roads that would be included in the calculation of heavy vehicle charges.

The scope for Reform options A and B aligns with the current scope of the PAYGO (pay as you go) system for setting heavy vehicle charges.

Current situation

Under the PAYGO system, expenditure on all public roads is within the scope of the exercise of calculating heavy vehicle charges.

This excludes private roads and toll roads.

Proposed reform

Under both reform options, the scope of the reform is the same as in current practice. That is, only roads covered under PAYGO are within scope, and that excludes private roads.

Table 31: Key elements of reform: network coverage

Element	Current situation	Reform option A	Reform option B
Scope	Expenditure on all public roads is within scope of the exercise of calculating heavy vehicle charges. This excludes private roads and toll roads.	Expenditure on all public roads is within scope of the exercise of calculating heavy vehicle charges. This excludes private roads and toll roads.	

Comparison of proposed reforms to arrangements under full reform

How toll roads and other roads might be dealt with under full road market reform will be considered in future reforms.

Independent regulation

Overview

One key proposed reform is the implementation of independent price regulation for heavy vehicle charges. The model of independent price regulation varies slightly between Reform options A and B.

Current situation

Since 1992, the NTC has periodically made heavy vehicle charging determinations at the request of the TIC. Determinations have typically been made every seven years. The NTC's role in this activity is consistent with its role as described in:

- the *National Transport Commission Act 2003*;
- the Inter-Governmental Agreement for Regulatory and Operational Reform in Road, Rail and Intermodal Transport; and
- the statement of expectations for the NTC for the period from 1 January 2017 to 31 December 2021.

The heavy vehicle charging determinations, in general, involve:

- the NTC preparing a regulation impact statement (RIS) that recommends revised heavy vehicle charges and contains supporting analysis; and
- consultation with governments and industry, typically including public submissions and workshops with key stakeholders, on proposed changes to heavy vehicle charges.

In the final part of the determination process, the NTC provides a RIS to the TIC for approval. Once the TIC has agreed to the new charges, each state or territory is expected to implement the changes to the model law prepared by the NTC. The model law enacts the new heavy vehicle charges contained in the RIS.

In practice, each state and territory may decide to enact all, some or none of the changes in its legislation. This can result in heavy vehicle registration charges in some states or territories not aligning with the charges agreed by the TIC. Currently, heavy vehicle registration charges in the Northern Territory and Western Australia do not align with the charges agreed by the TIC.

On occasion, the TIC agrees to make changes to heavy vehicle charges between determinations. Those changes are usually consistent with the most recent charges determination and are typically made to address specific issues.

Proposed reforms

Reform options A and B both involve implementing price regulation, which is defined as a system in which heavy vehicle charges are set by an agency or organisation at arm's length from government. That agency or organisation is referred to as an 'independent price regulator' (IPR).

This RIS defines the broad features of the IPR and its operation, but does not say which agency or organisation will perform that role.

Key elements of reform: roles, functions and powers of the regulator

The development of an IPR can be best described in terms of the roles, functions and powers of the proposed regulator.

Table 32 compares the current situation with the proposed functions under reform options A and B:

- Green indicates that the function is similar to or only slightly different from the NTC's current function.
- Pink indicates that the function is new.
- Blue indicates that the function is significantly broader under Reform option B than under Reform Option A.

The functions of the IPR in Table 32 assume that Reform option A also involves prices being set using a forward-looking cost base (FLCB).

Table 32: Key elements of reform: independent price regulation

Element	Current situation	Reform option A: Price regulation	Reform option B: Enhanced price regulation	Discussion
A: Expenditure information provision	Historical road expenditure is provided to the NTC by state and territory governments in accordance with the NTC's expenditure guidelines.	The IPR prepares and maintains guidelines that define the format in which information on expenditure and other information (such as asset values and remaining asset lives) is to be provided to the IPR. The IPR has the power to reject forecast expenditure if the forecast is not provided in the required format.		Similar to the NTC's current approach, but slightly enhanced. Additional data, such as asset values and remaining asset lives, is required to be collected.
B. Expenditure scope	The NTC currently undertakes an informal and limited review of historical expenditure figures provided by state, territory and local governments.	The IPR prepares and maintains guidelines that define the scope and type of forward-looking expenditure and other information to be provided by state and territory governments to the IPR. The IPR is able to review forecast expenditure and other information provided by state and territory governments to assess whether the expenditure is within scope of the charging system, as per the guidelines. The IPR informs state and territory governments if there are problems in aligning forecast expenditure and other information with the guidelines.		Similar to the NTC's current approach, but the IPR has powers to review expenditure to ensure that it is within scope.
C: Cost base and charge calculations	The NTC calculates the cost base and revised heavy vehicle charges.	The IPR calculates the cost base and revised heavy vehicle charges. The IPR sets charges with reference to a set of pricing principles agreed by government.		Similar to the current NTC approach, except that the IPR may work to a set of more formal and possibly regulated pricing principles.
D: True-up mechanism	A true-up mechanism is not required, as historical expenditure is used to estimate heavy vehicle charges.	The IPR applies a true-up mechanism to correct for under- and over-expenditure in the previous period.		The new pricing mechanism can be considered when applying an FLCB.
E: Charge setting	The NTC recommends price changes to the TIC. Once the price changes are agreed by the TIC, state and territory governments then decide to implement all, some or none of the changes.	The IPR determines new charges, which then become law without the need for agreement from governments. The IPR is able to determine the mix of RUC and registration charges.		The new pricing power means that governments do not need to agree to changes to heavy vehicle charges.

Element	Current situation	Reform option A: Price regulation	Reform option B: Enhanced price regulation	Discussion
F: Rate of return	A rate of return is not required because the cost base is estimated using the PAYGO principle, using an average of 7 years of historical expenditure.	The IPR sets a suitable rate of return for capital investments. This is required under an FLCB using the standard building-block model.		New pricing power that is not required under the current approach.
G: Mix of RUC and registration charges	In the most recent NTC charging determination (2014), total heavy vehicle revenue comprised 62% RUC and 38% registration charges. The NTC indicated that the 'efficient' level is around 72% RUC and 28% registration charges and should be transitioned to over time.	No change	The IPR sets charges (including the mix of RUC and registration charges) with reference to a set of pricing principles agreed by government. For example, if this led to a higher RUC and lower registration charges, the additional revenue for the Australian Government from this change would be redistributed to state governments to ensure that they obtain the same revenue that they currently receive from heavy vehicle registration charges.	The IPR has discretion to alter the mix without approval from governments.
H: Expenditure oversight	The NTC has no power to assess the efficiency of costs or whether expenditure is necessary or prudent.	No change.	The IPR is able to scrutinise expenditure proposals. This could include: ▪ <i>ex ante</i> assessment, examining prudence and efficiency when expenditure is first proposed to be included in cost base; and ▪ <i>ex post</i> assessment, examining the prudence and efficiency of expenditure after it has been expended.	Under neither model is the IPR able to disallow proposed expenditure; that power would come only with full economic regulation. Therefore, there would also be no avenue for merits review of pricing determinations.

Element	Current situation	Reform option A: Price regulation	Reform option B: Enhanced price regulation	Discussion
I: Consultative mechanism	The NTC undertakes consultation processes as part of its charging determinations, typically involving formal submissions and workshops with key stakeholders.	No change.	The IPR is required to establish a formal mechanism or body for user input into pricing determinations (e.g. an expert panel) and have regard to the advice of that body.	Similar to the NTC's consultation process, but more formal. Examples are the Australian Energy Regulator's Consumer Challenge Panel and the United Kingdom's Transport Forum.

Comparison of proposed reforms to arrangements under full end-state reform

Reform options A and B are forms of independent price regulation and shift the regulatory model closer to one that incorporates full economic regulation.

Price regulation can be distinguished from economic regulation in the following way:

- **Price regulation** is a form of regulation under which a revenue amount is estimated based on forecasts of road providers' forward-looking costs of providing heavy vehicle road services. The revenue amount is then used to estimate heavy vehicle charges.
- **Economic regulation** is a form of regulation under which the regulator sets maximum allowable revenue or prices for a regulated entity. The revenue or price cap is typically set with reference to prudent and efficient costs and agreed levels of service.

The key distinctions between price regulation and economic regulation are outlined in Table 33. The table assumes that road agencies operate under current arrangements—for example, they are not able to enter into financial deficit.

Table 33: Comparison of independent price regulation to full economic regulation

Function of IPR	Current	Independent price regulation		Economic regulation
		Reform option A	Reform option B	
Sets expenditure format guidelines for input data	Yes	Yes, with powers to enforce format	Yes, with powers to enforce format	Yes, with powers to enforce format
Reviews input data to ensure that it is within scope	Yes	Yes	Yes	Yes
Calculates cost base, allowable revenue and charges	Yes	Yes	Yes	Yes
Reviews prudence and efficiency of expenditure (<i>ex ante</i> and <i>ex post</i>)	No	No	Yes, but without power to disallow	Yes, with powers to disallow
Develops and sets agreed service levels	No	No	Yes, but only for key freight routes	Yes
Monitors delivery of service levels	No	No	Yes, but only for key freight routes	Yes

Forward-looking cost base

Overview

One of the key reforms is the introduction of an FLCB. Currently, the NTC develops a cost base for charging determinations using 7 years of historical road data.

Reform options A and B both propose the same reform to the cost base.

Current situation

To calculate the cost base in charging determinations, the NTC currently uses an exponential moving average of nominal historical expenditure over 7 years (EMA7). The EMA is a particular type of weighted moving average, in which the weighting for each subsequent data point decreases exponentially (NTC 2014).

Proposed reform

Under both reform options, revenue and charges would be based on a standard building-block model (BBM). Box 2 gives an overview of the standard BBM. A more detailed discussion of building block models and how they can be applied to roads is in Farrier Swier Consulting (2017).¹⁴

Box 2: The standard building-block model

A BBM is a standard approach to determining an appropriate level of revenue for a utility. It is used in a range of sectors, such as electricity networks and water supply.

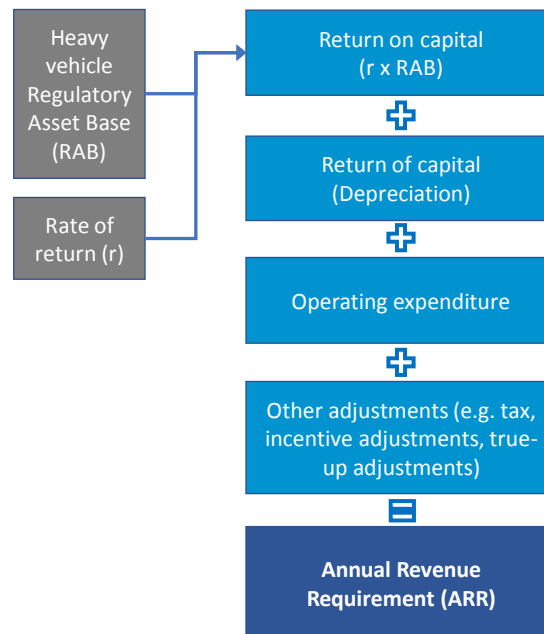
While there are variations and additions to the BBM by some regulators, the annual revenue requirement for each year of the control period is usually estimated with reference to three components (Figure 5):

- return on capital;
- return of capital (depreciation of capital assets); and
- operating and maintenance costs.

The control period is the period over which charges are regulated. The return on capital is calculated with reference to a regulatory asset base and a rate of return.

The regulatory asset base is rolled forward each year of the control period. This involves adding new capital expenditure to the opening regulatory asset base, less disposals and depreciation. Therefore, the BBM requires the estimation of capital expenditure and operating and maintenance costs for each year of the control period.

¹⁴ This report can be accessed at <https://infrastructure.gov.au/roads/heavy/>.

Figure 5: Annual revenue requirement

It is assumed that there will be one BBM for each state or territory government based on road management data and proposed expenditure in that jurisdiction.

It is assumed that a single BBM will be constructed for calculating the revenue requirement for roads managed by local governments. However, the local government BBM will need to rely on historical expenditure. The precise nature of this approach is yet to be determined.

The allowed revenues of each of the BBMs would be aggregated into a national BBM.

Key elements of reform

Reform options A and B both propose the establishment of an FLCB (Table 34).

Table 34: Key elements of reform: forward-looking cost base

Current situation	Reform option A	Reform option B
The cost base is developed based on the NTC approach.	Apply a BBM to determine allowed revenue for each year of the regulatory control period.	

Key issues in implementing a forward-looking cost base

Key issues in implementing an FLCB include:

- the transition of prices from the current charging system to one using a BBM;
- the length of the control period; and
- implications for allocating costs to heavy vehicles and across vehicle types.

The transition of prices from the current charging system to one using a BBM

Key principles proposed for the reform are that the initial prices (and revenues) should be similar to current levels and that there is a smooth transition to any new price levels under the building-block approach. This would remove price shock for heavy vehicle road users and revenue shock for jurisdictions. There are two alternative strategies to achieve that outcome:

- **Line in the sand:** This involves multiplying the initial regulatory asset base by a factor (which may be greater or less than 1) to ensure that the total revenue equates to historical levels.
- **Zero regulatory asset base:** This involves setting the opening regulatory asset base to zero value and bringing forward revenue to achieve a targeted transition price path.

Duration of the regulatory period

There is a need to determine the regulatory control period. Three options could be:

- short regulatory periods (2–3 years);
- longer regulatory periods (4–5 years); or
- short regulatory periods initially (2–3 years) as a transitional arrangement, with longer periods (4–5 years) in the longer term.

Implications for allocating costs between heavy and light vehicles and across vehicle types

As part of the introduction of a BBM, it is assumed (for the purposes of this RIS) that current cost allocation assumptions and principles will be used initially to allocate costs to heavy vehicles and across vehicle types. A key issue for governments is the degree to which the IPR is able to independently amend the cost allocation assumptions over time.

Changes between the current situation and reform options

The key change is to move to charges being determined by future expenditure rather than historical expenditure.

Comparison of proposed reforms to arrangements under full reform

Under full end-state reform, the BBM is determined based on prudent and efficient benchmark costs and agreed levels of service. Additionally, under full reform, there is expected to be much greater scrutiny of the regulatory asset base; for example, of whether the assets in the regulatory asset base are based on an optimally configured road network.

Levels of service

Overview

The introduction of an IPR and FLCB may encourage road agencies to shift from an asset-preservation mindset to a more service-centred mindset. Part of that could be focused on levels of service (that is, making stronger links between what users pay and what they receive in return).

Current situation

Currently, governments do not explicitly state levels of service. Rather, service levels are implicit in the existing expenditure allocated to roads.

Proposed reform

Under Option A, there is no change.

Under Option B, a customer service charter introduced for key freight routes would specify levels of service. State and territory governments would report to the IPR on performance against the customer service charter. Meeting those specified levels of service would not be a legal obligation, but reporting against them would be public.

Many state and territory road providers already measure service levels on key freight routes. Under a customer service charter, those measurements would feed into more public reporting of service delivery to heavy vehicle road users. The rationale for doing so is to begin shifting the focus to customer needs and service level accountability, which are underlying themes of the end state that HVRR is working towards.¹⁵

A consistent measure of service would be required across all jurisdictions, such as the Heavy Vehicle Infrastructure Rating (HVIR) currently used to rate roads under the HVRR asset registers (published on the TIC website). The HVIR captures simple measures of heavy vehicle access, safety and road condition for every 100-metre section of Australia's key freight routes.

Road providers may choose to set a benchmark level of service for particular routes higher than the current HVIR scale, or choose to focus on additional aspects of service or on road sections with the lowest current rating. Areas to target would be identified through engagement with industry (heavy vehicle road users and others).

National Heavy Vehicle Regulator data on network performance could also be drawn on to provide a more holistic benchmark of heavy vehicle service levels.

It would take a number of years until the achievement of service levels set under a charter could be fairly assessed.

These options are summarised in Table 35.

Table 35: Key elements of reform: levels of service

Current situation	Reform option A	Reform option B
Levels of service are not stated by governments. Rather, they are implicit in the existing expenditure allocated to roads.	No change to existing levels of service arrangements.	Customer service charter for key freight routes (not a legally binding commitment).

Changes between current situation and Reform option A

Option A makes no change from the current situation. Current levels of service being delivered on different roads across Australia are assumed to continue. There are no changes to the way service levels are articulated or reported on.

¹⁵ For instance, under full economic regulation, the regulator would set charges/revenues to recover the efficient cost of providing a level of service that has been agreed with road users and road providers.

Differences between current situation and Reform option B

Option B would introduce some improved reporting of levels of service to the IPR and some increased accountability to heavy vehicle road users.

Option B would be based on a customer service charter based on the heavy vehicle infrastructure ratings (TIC 2017c^{2017c}; see Box 3) for key freight routes. The charter would not be legally binding on governments.

Box 3: Heavy vehicle infrastructure rating

Heavy vehicle asset registers and infrastructure ratings (TIC 2017c) are essentially gap analyses that compare the road categorisation with the heavy vehicle infrastructure rating (HVIR).

Each 100-metre road section is given an HVIR based on three components important to heavy vehicle operators:

- access, based on heavy vehicle permitted access (40% weighting);
- ride quality, based on the International Roughness Index (40% weighting); and
- safety, based on lane and shoulder width as well as road markings (20% weighting).

Comparison of proposed reforms to arrangements under full reform

Under full economic regulation, the BBM evolves such that capital expenditure and operating expenditure forecasts are set to reflect the expenditure required to meet defined service levels for all roads. Under Reform option B, state and territory governments will commit to a customer service charter on key freight routes for heavy vehicles.

This contrasts with the current arrangements, under which there is no requirement for a road provider to meet or commit to particular defined service levels.

Data requirements

Overview

The development of an FLCB and movement to independent price regulation will require improved data measurement and reporting.

The new IPR would need accurate and reliable data in order to do its job, particularly to input into a BBM and assist in its limited oversight capacity.

The data inputs relevant in this section include those that will assist the IPR to undertake both *ex ante* and *ex post* scrutiny of road expenditure for each state and territory, and could include:

- detailed information on road expenditure (and by type of expenditure) and road use at a project, road link or road section level; and
- information on current service levels across the road network.

Current situation

Information currently provided to the NTC on road expenditure by state and territory governments is limited to that which is used to develop the PAYGO cost base. It does not

include detailed information on road expenditure or road use at the project, road link or road section level; nor does it include information on current implicit or stated service levels.

Austrroads has been developing a national data standard for roads. If implemented by governments, this has the potential to assist with providing more harmonised collection and reporting of data that could be used to assist the IPR's scrutiny of expenditure.

Proposed reform

Under Reform option A, there is no change to data requirements. Inputs to the FLCB are provided using existing (non-standardised) data.

Under Reform option B, there is a move to improved data measurement and reporting to support the work of the IPR. The intention is that improved data measurement and reporting will apply only to state and territory roads. Improved data would also support better road management, particularly through data sharing and comparison.

These options are summarised in Table 36.

Table 36: Key elements of reform: data requirements

Current situation	Reform option A	Reform option B
Information currently provided to the NTC on road expenditure by state and territory governments is limited to that which is used to develop the cost base.	No change from current situation.	Information and data are provided to the IPR to assist it to undertake both <i>ex ante</i> and <i>ex post</i> scrutiny of road expenditure for each state or territory.

Changes between current situation and Reform option A

For this parameter, Reform option A is the same as current practice (the base case). That is, the current practices and systems for measuring and reporting road data are assumed to continue.

Differences between current situation and Reform option B

The Reform option B setting would require improvements to road data measurement and reporting to facilitate both *ex ante* and *ex post* scrutiny of road expenditure for each state or territory.

Comparison of proposed reforms to arrangements under full reform

Full economic regulation would require significantly improved data measurement and reporting to support more intensive oversight of key assumptions contained in the BBM, including road expenditure, road usage, asset values and remaining asset lives.

Additionally, the improved data requirements would cover state, territory and local government authorities to achieve more holistic, user-focused asset management.

Price setting

Overview

‘Price setting’ refers to the process for determining the levels of the RUC (collected through fuel levies) and registration charges for heavy vehicles.

Current situation

Currently, once the TIC has agreed to a new set of heavy vehicle charges, each state and territory is expected to implement the changes to heavy vehicle registration charges through the model law prepared by the NTC. The model law enacts the charges contained in the RIS.

In practice, each time charges are reset, each state and territory may decide to enact all, some or none of the changes in its legislation. This can result in heavy vehicle registration charges in some states or territories not aligning with the charges agreed by the TIC. Currently, heavy vehicle registration charges in the Northern Territory and Western Australia do not align with the charges agreed by the TIC.

Table 37: Key element of reform: price setting

Current situation	Reform option A	Reform option B
The NTC recommends a set price and governments agree to implement that price. In practice, some governments have transitioned to the new price over time or not at all.	IPR sets a band of allowable registration charges, which allows jurisdictions the flexibility to move towards nationally consistent charges during a transition period. IPR sets an RUC rate (excise) that applies in all jurisdictions.	

Both reform options are likely to provide a clearer transition path for governments but also give them flexibility to move charges to the new level over time.

This structure would allow the continuation of current practice, whereby Western Australia and the Northern Territory set registration charges independently of TIC decisions. However, states and territories would align with the new charge levels at the end of the transition period.

Comparison of proposed reform to arrangements under full reform

The final arrangements under full reform are not clear, as there is a question about whether future distance-based road use charges should be nationally uniform.

The need for uniformity and an allowance for variations is a question for the TIC and is beyond the scope of this RIS.

However, the competing objectives appear to be:

- national consistency, which would lead charges to converge over time; and
- optimal asset management, which would lead charges to diverge.

Hypothecation / funding reform

Overview

In this context, hypothecation is the ‘earmarking’ of some or all funds collected in heavy vehicle road use charges to be used for a special purpose, such as investment in or the maintenance of freight routes.

Current situation

There is currently little hypothecation of funds collected through either the RUC or vehicle registration fees, except for hypothecation of heavy vehicle registration fees in Western Australia.

No change to those arrangements is proposed under the reform options considered in this RIS.¹⁶

Table 38: Key element of reform: hypothecation / funding reform

Current situation	Reform option A	Reform option B
No hypothecation	Maintain existing system of funding via government budget processes (no change).	

Comparison of proposed reforms to arrangements under full reform

There is general agreement that some form of hypothecation will be present under full end-state reform. However, this topic is the subject of a separate governmental working group.

Community service obligations

Overview

Community service obligations (often referred to as CSOs) provide funding for roads that are not economically viable. This ensures that a minimum level of service is provided, even for less travelled roads.

Current situation

There are no explicit community service obligations.

Key elements of reforms

No change is proposed for community service obligations under either reform option. That is, there would be no explicit community service obligations and current funding arrangements for less travelled roads would continue.

¹⁶ It is noted that consideration of funding reform may be brought forward by the TIC to align with decisions on the IPR and FLCB.

Table 39: Key elements of reform: community service obligations

Current situation	Reform option A	Reform option B
No explicit community service obligations.	Maintain existing funding to ensure minimum levels of service on all roads (no change).	

Comparison of proposed reforms to arrangements under full reform

Full reform may involve implementing a community service obligation framework in future funding arrangements.

Appendix 2: Summary of TIC reforms

The Department of Infrastructure, Regional Development and Cities will produce a separate paper that will describe the objective of the broader HVRR program and the expected outcomes of the reforms. The paper will be published on the [department's website](#)..

Appendix 3: Submission format and guide questions

COVER SHEET FOR SUBMISSIONS		
Please complete and submit this form with your submission by COB on Friday, 31 August 2018		
Email submissions to: hvrr@marsdenjacob.com.au		
Contact name:		
Organisation:		
Position:		
Email:		
Phone:	Mobile:	
Postal address:		
Length of submission (number of pages, including this cover sheet):		
Are you making this submission as: (please select one of the following categories)		
☐ Union	☐ Business	☐ Academic
☐ Community organisation	☐ Employer organisation	☐ State/ territory government
☐ Individual	☐ Industry representative	☐ Local government
☐ Other (please specify):		
Which of the following industry sectors is relevant to your work?: (pick one or more)		
☐ Industry providing road transport		
☐ Industry using road transport		
☐ Government policy / road asset management		
☐ Other (please specify):		
What, specifically, do you or your business do?		
Do you operate in two or more states or territories?		☐ Yes ☐ No
Approximately how many people work for the business or organisation across Australia?		
☐ Fewer than five employees	☐ Five to 20 employees	☐ 21 to 100 employees ☐ 100+ employees ☐ n.a.

Please note:

- All submissions will be published unless clearly marked as CONFIDENTIAL.
- Neither the Australian Government nor the Department of Infrastructure, Regional Development and Cities takes responsibility or shall be liable for any breach of copyright or libellous or defamatory comments in submissions published by the Department of Infrastructure, Regional Development and Cities.

Background questions

1. **Is the reform objective appropriate?**
2. **In general, do you support the program of heavy vehicle road reform?**

Overview questions

3. **Of the reforms considered in this Consultation RIS, which reform option(s) do you support? What are your reasons/concerns?**
4. **Do you think that the preliminary analysis presented in this RIS understates or overstates the costs of any of the options? If so, by how much and in what ways?**
5. **Do you think that the preliminary analysis understates or overstates the benefits of any of the options? If so, by how much and in what ways?**
 - a. What impact will Reform option A or B have on road maintenance costs?
 - b. What impact will Reform option A or B have on road capacity expansion costs?
 - c. What impact will Reform option A or B have on road quality and levels of service?
6. **Do you believe that any of the reform options will result in other impacts (such as regulatory burden, competition impacts or increased risks) compared to the current arrangements?**
7. **Thinking of your preferred reform option, are there particular elements that you feel strongly about and either support or oppose?**
Please explain your reasons and describe the change in costs and/or other changes that are likely to arise.
8. **What other matters should decision-makers take into account when considering whether to implement an IPR and FLCB?**

Transitional arrangements

When laws and regulations are changed, the arrangements and timings for introducing and enforcing the new laws are often referred to as ‘transitional’ arrangements. The transitional arrangements used can have a significant impact on the changeover costs for the Australian Government, state and territory governments and businesses.

9. **Can you identify particular changes for which a different transitional arrangement would provide a benefit?**

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